

## **BRITISH NUTRITION FOUNDATION CONFIRMS THERE IS NO EVIDENCE THAT SLICED BREAD BLOATS US**

### ***New report by Dr Elisabeth Weichselbaum\* investigates the claim that bread causes bloating***

Despite a distinct lack of scientific proof, the start of the 21<sup>st</sup> century has seen a continuation of the claim that sliced supermarket bread made by the Chorleywood Bread Process (CBP)\*\* causes bloating. A new report published by the British Nutrition Foundation (<http://onlinelibrary.wiley.com/doi/10.1111/j.1467-3010.2011.01943.x/abstract>) in the journal *Nutrition Bulletin* reviews the science behind this common claim and confirms that, to date, there is no evidence to support claims that CBP bread affects the gastrointestinal system in a different way to other bread making processes.

Dr Elisabeth Weichselbaum, author of the report, says “For the average healthy consumer, there is no evidence that regular consumption of bread causes bloating or gastrointestinal discomfort, or that the way in which bread is produced, by modern or traditional methods, leads to different effects on the gastrointestinal system.”

“Bread is an important source of dietary fibre\*\*\*. Some people who eat little fibre and suddenly increase their intake in line with recommendations can experience abdominal discomfort, particularly when they don’t drink enough non-alcoholic fluids and are fairly inactive, but these symptoms usually disappear after a while as the body gets used to higher amounts of fibre. An alternative misconception could have arisen among those people with low fibre intakes who frequently suffer from constipation which is often perceived as being bloated. Dietary recommendations encourage a high fibre intake because of its important role in bowel health and other health benefits and most people in the UK would benefit from increasing their fibre intake.

Many consumers are not aware that four slices of wholemeal provides approximately 10g fibre (around 55% of the daily requirement); four slices of brown bread gives 7g of fibre (38% of the daily requirement); and four slices of white gives 3.2g of fibre (about 18% of the daily requirement); and may be unnecessarily avoiding bread due to their misconceptions about bloating.

### **IRRITABLE BOWEL SYNDROME AND FIBRE IN BREAD**

Dr Weichselbaum explains that for sufferers of Irritable Bowel Syndrome (IBS) there is evidence to show that fibre in wholemeal bread may actually help relieve IBS symptoms for some people by shortening digestive transit time and conversely, that eating white bread, which has a lower bran and thus a lower insoluble fibre level, can help reduce the effects of diarrhoea-predominant IBS for others.

## **ALLERGIES AND INTOLERANCES**

In the Noughties, it became almost fashionable to parade a so-called food allergy or intolerance leading to many people without a medically diagnosed allergy unnecessarily avoiding certain food groups like wheat or dairy. Dr Weichselbaum continues, “As with other forms of allergy, the proportion of people who perceive they are allergic to wheat is clearly higher than the actual prevalence of wheat allergy. If a wheat allergy is suspected, diagnosis should be made via standardised tests and unnecessary wheat avoidance may lead to inadequate intakes of key nutrients.”

In 2010 a report by the University of Portsmouth\*\*\*\*\* discovered too many people are self-diagnosing food allergies and could be restricting their diet unnecessarily. This research showed that up to 20 per cent of adults think they suffer from a food allergy or food intolerance. However evidence suggested that the real prevalence of food allergy and intolerance in adults was in fact less than 2 per cent. It means that millions of people could be avoiding nutritious foods unnecessarily and without proper medical advice.

The report by the University of Portsmouth also reveals that over half of the British population believes that wheat allergy is a common illness and in 2009 wheat was the most commonly self reported food allergen for both men and women. Those living alone and those aged 35-44 were most likely to report such an allergy or intolerance. But the report highlighted that confirmed wheat allergy is less common than other food allergies such as peanuts and other nuts, eggs and milk.

## **NUTRITION**

Bread made with the CBP is not less nutritious than bread made with more traditional bread making processes. Investigations by Campden BRI in 2008 and 2011 found that the vitamin content of bread baked using the Chorleywood Bread Process is very similar to bread baked using more traditional methods and that this applies to white and wholemeal bread\*\*\*\*. It is not widely

recognised that bread is an important source of nutrients as well as fibre in the UK diet. “The type of flour used\*\*\*\* and the addition of nutrients to restore those lost during milling (a legal requirement in the UK but not in all other countries) has the most significant impact on the total nutrient content of bread” explains Dr Weichselbaum.

## **YEAST AND BLOATING**

Myths about bread and bloating include a focus on yeast which by its very nature normally causes things to rise and therefore creates a mental image of bloating. Higher levels of initial yeast addition required for shorter fermentation processes such as the CBP have also been blamed by some for the modern concern about bloating. However, it is not only the amount of yeast that is added to the dough at the start of the bread making process that determines the total amount of yeast in the final dough, but also the fermentation time. During fermentation the yeast multiplies and therefore longer fermentation time will lead to increased yeast levels in the dough, meaning that the overall level is similar to that in a shorter fermentation process. Furthermore, the yeast in bread is deactivated during baking and therefore, no matter what bread making process is used, no live yeast will be present. “We looked at whether yeast in bread is associated with symptoms of bloating, but found no published evidence to support this.” says Dr Weichselbaum.

## **COELIAC DISEASE**

Coeliac Disease (CD) is a chronic systemic autoimmune disorder induced by the gluten in wheat, barley and rye which is thought to be under-diagnosed in countries such as the UK. CD sufferers experience gastrointestinal symptoms including bloating and constipation. Some studies suggest that bread made with sourdough may increase tolerance of gluten in people suffering from CD. However, according to Coeliac UK ([www.coeliac.org.uk](http://www.coeliac.org.uk)), there is insufficient evidence to recommend that coeliac patients can tolerate sourdough bread without experiencing symptoms. Therefore, it is irresponsible to suggest that bread made from sourdough is suitable for CD sufferers.

Dr Weichselbaum says, “There are no published studies comparing longer fermentation with baker’s yeast with shorter fermentation on symptoms in CD sufferers. However, even if longer fermentation with baker’s yeast was associated with a higher degree of gluten degradation, it is unlikely that the amount of gluten would be reduced to a level that is tolerated by most CD sufferers. Therefore, it is unlikely that length of fermentation using bakers’ yeast increases tolerance of bread in CD patients.”

Alex Waugh, Director at the Flour Advisory Bureau says: “Even though nine million loaves of sliced bread are eaten daily in the UK, making a positive contribution to our good health as a nation, misconceptions still persist about the nutritional value of sliced bread. That’s why we commissioned this independent report to understand the science before reaching out to consumers to address their concerns.”

“Sliced bread has been a part of our lives for over 50 years, and the sandwich for 250 years, and according to research, 57% of us believe the CBP process should be celebrated as an iconic invention, alongside the likes of the internet, space travel and the mobile phone.”

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Notes to editors:

**\* Dr Elisabeth Weichselbaum, MSc, PhD, Nutrition Scientist**

Elisabeth works at the British Nutrition Foundation as a Nutrition Scientist and has worked on various projects within the science team. Her main publications included an in-depth review of probiotics and their effects on health, a review on apple polyphenols and CVD, an overview of the role of potatoes in the UK population and a briefing paper on ‘Nutrition, health and schoolchildren. She was also a co-author of a major review on red meat. Elisabeth has also been involved in the dissemination and communication work of the EC funded projects EuroFIR and EuroFIR Nexus (the follow-up of EuroFIR), and is involved in the *European Food Framework* project.

Elisabeth holds a Master’s degree in human nutrition and did her PhD in human nutrition with a focus on public health nutrition at the University of Vienna, Austria. During her PhD studies she worked on the *European Nutrition and Health Report 2004*, of which she is an editor. She then worked as a Scientific Employee at a small centre of public health in Vienna, before coming to London and joining the BNF in June 2008.

**\*\* Chorleywood Bread Process**

The CBP, which was developed in 1961 by the Flour Milling and Baking Research Association at Chorleywood, is a modern commercial process used in many bakeries in the UK and several other countries (Brennan 2006). This method produces bread and other fermented bakery goods with a shorter fermentation period. Dough development in CBP is achieved partly during high-speed mixing of the dough in just a few minutes (8-15 minutes) followed by a shorter fermentation period

of about an hour (Brennan 2006). The CBP also allows the use of wheat flour that is lower in protein than flour traditionally used in bread making. Since flour made from British wheat had a relatively low protein content ('soft' wheat) and had traditionally not been suitable for bread making, using the new process meant that a higher proportion of flour milled from British wheat could be used. Premium and wholemeal breads require a higher proportion of flour milled from wheat with a higher protein content and are consequently more expensive to produce as this wheat costs more and typically needs to be imported (The Federation of Bakers 2002).

To facilitate rapid dough development, oxidants such as ascorbic acid (vitamin C) are added in the CBP method. More yeast has to be added at the initial stage (~2.5% of flour weight) and higher proof temperatures are required in the CBP as the yeast has less time to multiply during a shorter proof period (proofing is the final dough-rise step before baking) (Brennan 2006). A small amount of vegetable fat is also added, although this is common in most bread making processes. The addition of fat helps to keep the bread soft and helps the dough pass more easily through the production process.

In the UK the CBP is now by far the most common method used throughout all sectors of the bread baking industry.

**\*\*\* The nutritional composition of white, brown and wholemeal bread (per 100g):**

	<b>White</b>	<b>Brown</b>	<b>Wholemeal</b>
Carbohydrate g/100	46	42	42
(of which sugars) g/100g	3.4	3.4	2.8
Protein g/100g	7.9	7.9	9.4
Fat g/100g	1.6	2.0	2.5
<b>Dietary Fibre g/100g (AOAC ANALYSIS)</b>	<b>2.5</b>	<b>5.0</b>	<b>7.0</b>
Calcium g/100g	177	186	106
Iron mg/100g	1.6	2.2	2.4
Thiamin mg/100g	0.24	0.22	0.25
Niacin mg/100g	1.6	2.8	3.8

**Source:** McCane and Widdowson (sixth edition)

The Campden BRI report dated November 2011 proved that the levels of B2, B5, B6, folic acid and vitamin E are higher for both white and wholemeal bread produced by CBP compared to white and wholemeal bread made by sourdough bulk fermentation. The levels of B3 are directionally higher for both wholemeal and white bread produced by sourdough bulk fermentation compared with bread produced by CBP. Overall the results show that the vitamin levels of bread produced by either the Chorleywood bread making process or sourdough bulk fermentation are broadly similar.

The vitamin content of bread produced using the Chorleywood bread making process was compared with the vitamin content of sourdough bread produced by bulk fermentation. The bulk ferments consisted of a 16 hour and 40 hour sourdough created from a starter culture *Crème de Levain*. The control breads and the breads produced by bulk fermentation were made using white and wholemeal flours. The final baked breads were assessed on the day after production. The assessments carried out on the finished breads were moisture content on the crumb and the vitamin content of the finished product. The vitamins tested for were Vitamin E, Riboflavin B2, Niacin B3, Folic Acid, Pyridoxine B6 and Pantothenic Acid.

**\*\*\*\* Highlights of nutritional benefits of bread:**

- White and brown bread provide 177mg per 100g of calcium. Four medium slices of white bread (140g) provides 248 mg of calcium, which is 31% of the EU Recommended Daily Amount (800mg).
- Four medium slices of white bread (140g) would provide 15% of the RDA of iron for a woman
- Four medium slices of wholemeal bread (140g) provides 0.35mg of thiamin which is 45% of the RDA for a woman (19-50 years old). The same serving will also deliver 42% of a woman's niacin RNI.
- Four slices (140g) of malted grain (also sold as Granary®) bread provides 123 mcg of folate, 4 slices of wholemeal bread delivers 56 mcg and white bread 9mcg of folate per slice.

\*\*\*\*\* **Today the range of flours available is wider than ever before.**

The basic flour categories are:

**Wholemeal** - 100% extraction, made from the whole wheatgrain with nothing added or taken away.

**Brown** - usually contains about 85% of the original grain, some bran and germ have been removed.

**White** - usually 75% of the wheatgrain. Most of the bran and wheatgerm have been removed during milling.

**Wheatgerm** - white or brown flour with at least 10% added wheatgerm.

**Malted wheatgrain** - Brown or wholemeal flour with added malted grains.

**Stoneground** - Wholemeal flour ground in a traditional way between two stones.

**Organic\*** - Flour milled from grain that has been grown to organic standards. Growers and millers must be registered and are subject to regular inspections.

\* It's good to see that as more people are looking to purchase organic foods, millers and bakers in the UK are responding to this demand. As more bakers are producing organic breads, these are becoming more readily available in local supermarkets and high street bakeries. Of course, you need organic wheat to produce organic flour. However, there's not enough organic wheat available in the UK to meet the current demand. UK flour millers therefore have to import some organic wheat. Organic wheat whether imported or home-grown, tends to be more expensive than its non-organic counterpart, which is one of the reasons why you may find organic bread and flour a little more expensive to buy.

#### \*\*\*\*\* **Wheat Hypersensitivity Report**

Dr Heather Mackenzie and Dr Carina Venter from the School of Health Sciences & Social Work at the University of Portsmouth are the authors of the 'Wheat Hypersensitivity Report' commissioned by the Flour Advisory Bureau in 2009.

#### **Federation of Bakers**

The Federation of Bakers represents the interests of the companies baking sliced and wrapped bread, bakery snacks and other bread products. It is a £3 billion industry at retail sales value employing 20,000 people supplying 80% of the nation's bread. It has eight company members running 47 bakeries in the United Kingdom.

[www.bakersfederation.org.uk](http://www.bakersfederation.org.uk)