

## ***Gluten free guarantee?***

Do people sigh and roll their eyes when you say 'its gluten free!' as if you have decided to join some weird cult? They say 'gluten free? You mean taste free!' or 'that's just a fad' and then when the newspapers have a headline grabber such as 'Gluten free diet increases your risk of heart disease' they smile gleefully and say ' I told you so' without bothering to discover what the research really says?

It is widely acknowledged that people with coeliac disease need to avoid gluten but what if you have what is known as non-coeliac gluten sensitivity? You *know* that somehow, in some way, that when you eat gluten it just doesn't agree with you. It may be digestive issues or it may affect you mentally such as making you more emotional or even mildly depressed or perhaps aggressive. Research is beginning to prove that you are right and it is not all in your imagination.

What is gluten anyway? And why all the fuss?! You know you probably shouldn't eat it, right? But you have no idea why not! That's why we are here- to pore over the research for you and try to make sense of the thing... because our whole ethos is based around how the food we eat is not only handled by our body but the consequences of this. There are consequences of eating gluten and we want to share them :)

Let's begin the story with a molecule present in our digestive system with the very weird name of zonulin (not quite sure how these names are arrived at but at least it's memorable!). Zonulin has a starring role in this narrative but we might need to digress a little before understanding its significance... bear with!

### ***Zonulin***

Our digestive system is actually one of our main contacts with the outside world (skin being another) and so they need to have a protective role as well as a digestive one. The gut lining, while helping us to absorb nutrients into our bloodstream, needs to be able to protect us from any nasty invaders that might make their way in via what we eat. Alessio Fasano, who discovered zonulin, describes the intestine, or gut, as a large tube lined with a single layer of cells - like a wall- with little gates between the cells that open and close, on command, to bring in the nutrients and keep out the bad guys. This has to be a very quick manoeuvre and zonulin is the guy that manages this tightly controlled process. The only problem is -zonulin is a great guy- in small doses - we all know someone like that! Too much zonulin and things get out of control; this results in the gates getting stuck in the open position! Yikes! End result- the gut becomes 'leaky' and can't control its borders. Hence the term 'leaky gut'! With access to all areas, potential enemies enter the bloodstream and our immune systems put their troops on alert.

Now all this sounds pretty nasty and no one likes to think of their gut leaking and a war breaking out but it is potentially this process that is the source of most auto immune and inflammatory conditions, perhaps even as far as most health conditions, we experience today.

Two of the biggest triggers of zonulin are bacteria and..... yes you guessed it: gluten! Let's be clear, this affects all of us - not just the chosen few...

### ***Non Celiac Gluten Sensitivity (NCGS)***

How can gluten make you feel emotional, moody, anxious or even aggressive?

Some people with NCGS suffer digestive problems (without the damage experienced by celiac sufferers) but some people find that eating gluten makes them anxious, depressed, moody or even emotional - but how?

We need to go back to zonulin at this point. Remember how he left the doors open which resulted in the immune system going on attack? Well sometimes some of the troops can get a bit over zealous, start creating mayhem (inflammation) which results in genes getting switched on that shouldn't - ones that affect our mental health.

Sometimes the gluten might affect our serotonin levels; you know the feel good hormone - the one that makes us feel happy.

Recent research found that gluten may influence mood by interfering with the serotonin pathway (just the way something is made in our bodies). Serotonin needs tryptophan (an essential amino acid that the body can't make itself that you get from eggs, salmon, turkey and bananas - to name but a few foods) in order to be produced. In another piece of research participants started the study with low levels of tryptophan before following a gluten free diet. After 1 year on a gluten free diet their tryptophan levels along with their serotonin levels had increased substantially. Glyphosate (remember?) has also been found to deplete levels of tryptophan.

Now stay with us as there is a bit more science to come!

When there is uncontrolled inflammation in the body sustained over a period of time, the body will instruct the adrenal glands (those guys who manage our fight or flight response) to release cortisol (which has many jobs but one of them is putting out fires!) to try to reduce it. High levels of cortisol can *also* divert tryptophan from making serotonin and rather divert it towards what is known as the 'kynurenine' pathway. It's complicated we know.. This is then metabolised (changed) into something called quinolinic acid; now this acid is neurotoxic (damaging to the brain and nervous system) and has been closely linked to brain and other neurodegenerative disorders such as Alzheimers.

Yes but surely not eating gluten is bad - what about that scary headline in the newspaper recently?

### ***Scary headlines***

We are all influenced by newspaper headlines, which generally misreport the findings of the latest research just to grab our attention. We may suddenly fear that a gluten free diet could damage our health. There was a study in the news recently which claimed that eating a gluten free diet put you at risk of cardiovascular disease (CVD). Typically the media had opted for a sensationalist headline instead of reporting it accurately.

The conclusion of the research was actually that 'a long term dietary intake of gluten was not associated with risk of coronary heart disease'. The link between a gluten free diet and risk of heart disease was then made under the assumption that if you are avoiding gluten you potentially have a reduced consumption of whole grains which *may* then affect cardiovascular risk; consumption of whole grains being associated with reduced heart disease. This is association and not causation. There is a difference. Basically the study did not say that a gluten free diet causes CVD. Celiac disease is associated with an *increased* risk of CVD but that risk is reduced once a gluten free diet is adopted. The reasoning for this is that inflammation is reduced in celiac disease by removing gluten; inflammation plays a major part in the development of CVD.

But what actually *is* gluten and haven't we been eating it for thousands of years without any problem? Why should it affect us all of a sudden? These are valid questions and that's why we like to research on your behalf and come up with answers for you but you need to keep reading to find out!

We know it's a long haul but do it in bite size pieces - you don't need to read it all in one go; take a break and come back!

### ***What is gluten then?***

Imagine a wheat grain or, if you can't, just google image it! It's actually a tiny seed and wow you wouldn't believe what is packed in that seed. Gluten is the landlord protein in that tiny wheat grain; he provides housing for gliadin and glutenin and a myriad of other proteins but they are the two main trouble makers; gliadin is thought to create more problems than glutenin. Other grains like rye, barley and oats have similar proteins but they all like to give themselves the same surname; 'Gluten'. Wheat as we know is made into flour for all sorts of foods like pasta, bread, cakes and oh so many other things - check ingredients lists to see how often it appears! There is a lot of gluten about..

Wheat has been around for eons and a lot of people are turning to ancient grains like spelt, Kamut®, emmer(also known as farro) and einkorn, which all still contain gluten, to avoid experiencing the problems that they experience with modern wheat, so what is going on.....

### ***Think we need to go back in time....***

For thousands of years man has been eating wheat grains but it seems that only in the last 50 years or so we have been having increasing tummy troubles. Let's have a look at some of the history..... stay with us, it's actually quite interesting!

Way back in the late 1800's, when Queen Victoria was still on the throne and the industrial revolution was in full swing, the modern steel roller was invented. This meant that grain milling was revolutionised. This was fantastic news, for the Victorians; it meant the parts of the grain could be separated to produce pure white flour which was affordable to all and could be shipped long distances and stored for longer. The only problem was that this process stripped all of the nutrients from the grain. Wholefoods have a combination of nutrients to complement each other and by extracting and transforming them it can have an adverse effect on the body.

The ability to make large quantities of flour and store it for long periods of time was thought to herald a new age. Industrial food processing had begun! Hurrah! We'll see later why this creates a problem.

### ***Let's fast forward to 1944; time travel is fun!***

In 1944 a man called Norman Borlaug (who was given the Nobel peace prize in 1970 for his efforts) was set the task of improving wheat yield and agriculture in a bid to end hunger, famine and misery around the world. He developed generations of wheat that were

resistant to disease, were able to withstand differing environments and provided a high yield. This was the advent of dwarf wheat varieties which we know today. The dilemmas of man- solve a major problem only to create a different insidious one later on.

### ***30 years later....***

The commercial introduction of glyphosate as a selective herbicide (which just means it kills specific weeds but keeps the crop unharmed) in 1974, to be able to produce even higher yields, has further changed the picture. It was thought to be the perfect herbicide because of its broad spectrum qualities and that it was toxicologically and environmentally safe (bit of a paradox there!). However, some research is pointing to its contribution towards obesity, Alzheimers, Parkinsons and possibly celiac disease; it has been found to affect the digestive system of fish in a similar way to the effect of gluten on the small intestine of celiac sufferers. Funnily enough since 1990 the incidence of celiac disease has risen exponentially in relation to the use of glyphosate on wheat crops.

Glyphosate also has an effect on our digestion; changing the delicate balance of those oh so famous gut bacteria.

### ***Incidence of Celiac disease***

We can't ignore Celiac disease in all of this so it's important first to understand what it is and the major part that gluten plays in its development. The symptoms may overlap with a wheat allergy but they are both quite different and so it is important to get an accurate diagnosis. A wheat allergy (like other allergies) can result in immediate life threatening symptoms.

Celiac disease is defined as a chronic auto-immune condition (chronic just meaning that it is an illness that persists for a long time- auto immune where the body attacks a part of itself) which is triggered by eating gluten (flour and flour products such as pasta and bread etc). The risk of developing the disease increases if we have the specific genes that predispose us to it. For those who like detail - the genes are called HLA DQ2 and DQ8. Environmental factors (which can be external such as foods, stress, air quality, and clean water - to name a few- or internal such as excess inflammation or hormones) can switch genes on or off. In this case gluten is the environmental factor that switches on these genes and celiac disease develops.

The auto immune response that takes place in celiac disease creates inflammation which damages something called the villi or brush border, which are tiny little finger-like projections (almost look like a sea anemone) in our small intestines, which are designed to help our body absorb nutrients (once the food has been broken down). This damage is only seen in celiac disease; the villi shorten and eventually flatten leaving the sufferer with intestinal damage. This then stops the body absorbing nutrients properly and can result in symptoms such as diarrhoea, abdominal pain and food intolerances. Further health problems such as anaemia, osteoporosis and other problems can develop due to the lack of available nutrients. Because it is known that gluten is the culprit, celiac sufferers must adhere to a strict gluten free diet. It is thought that celiac disease may be on the increase but the reasons are not clear especially if specific genes are involved.

### ***An interesting study***

A study conducted on the frozen blood of air force recruits between 1948 and 1954 was compared with blood in a similar demographic in today's time regarding the incidence of celiac disease and the conclusion was that in the last 50 years the incidence of celiac disease has risen dramatically. Because changes in human genetics take an extremely long time to respond to environmental challenges the researchers decided that the result was most likely to be a change in how the food industry processes cereal; changes in the genetics of wheat and how bread is processed.

So clearly something is amiss in our food today.

### ***Vital (?) Wheat Gluten***

Wait a minute, isn't gluten a problem? How can it then be vital?

Vital wheat gluten (which can be found as just **wheat gluten** in the ingredients list of a product) is created by washing wheat flour dough with water until all the starch granules have been removed, leaving just the sticky insoluble gluten. This is then used as an additive in baking because it adds elasticity to flour and improves the rise of the new dough. It effectively improves the texture and the chewiness. This makes it more of a robust mixture that can withstand the brutal process of commercial mixing. It increases the shelf life and also acts as a binder in foods. Modern food processing at its best! The ubiquity of gluten in the food processing industry can be found in some pastas, snacks, cereals, crackers, thickeners in food and of course bread and other bakery items. So potentially, exposure to gluten on a daily basis could be tenfold especially if a predominantly processed food diet is eaten. No wonder zonulin can't cope and has left all the doors wide open!

What is the alternative then?

### ***Gluten free grains***

As part of a healthy diet grains provide fibre, complex carbohydrate and essential B vitamins and minerals. If we can't eat gluten then what is the alternative?

Visiting the gluten free aisle is where most people head to but most of the 'gluten free' foods available in supermarkets have been highly processed and contain added sugars, fillers and Trans fats.

The best thing we can do is to avoid processed food.

Amaranth, quinoa, rice and buckwheat are all gluten free grains. Buckwheat sounds like wheat but is not. There are also various gluten free pastas and noodles available as the food industry attempts to cater for the gluten free market.

But what about those ancient grains mentioned earlier?

### ***Ancient grains***

By definition ancient grains are grains which have largely remained unchanged for the last several hundred years and have not gone through the changes that modern wheat has. They are also usually grown organically by low input farming. Wheat varieties of ancient grains, of which gluten is still a component part, include spelt, emmer, einkorn, farro and Kamut®.

Kamut® in particular has been the focus of research and in being compared to modern day wheat has been found to have an **anti-inflammatory** effect whereas inflammatory markers were increased by modern day wheat.

Some sufferers of NSGS have reported that they can eat ancient grains without suffering the symptoms experienced with modern wheat.

More research needs to be done though to determine how exactly ancient grains differ from modern day wheat.

So, no more science .....for now.....

We've shared our reasons why we champion gluten free eating. Here at ApresFood Co we don't want to fight with food- we want to show you how you can eat delicious food that's good for your health too! Stop by and start your gluten free journey today!

If you want to dig a little deeper all the research we used is here .....

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