



Food for Health - CLA the essential fatty acid

Conjugated linoleic acid (CLA) is a beneficial fatty acid found in milk fat and meat from ruminant animals (cattle, goats, sheep etc). It is a unique fatty acid as it has proven positive effects on many aspects of human health, including anticancer and immune stimulating activities. In addition, CLA has been shown to reduce markers of atherosclerosis (hardening of the arteries) and diabetes and furthermore it has a positive effect on obesity, which is an increasing problem worldwide. In obese animals, CLA has been reported to reduce body fat and increase lean body mass. Beef and dairy fats are the main sources of CLA due to the production of CLA by rumen bacteria, which converts linoleic acid into CLA. Interestingly, some bacteria from the human gut produce low levels of CLA, such as bifidobacteria. Bifidobacteria are commonly found in probiotic foods and have anti-inflammatory and anti-cancer effects. However the level of CLA production by human commensal bacteria is so low, that the main source of CLA in human tissue is from dietary intake. Consequently in order to increase CLA in human tissues, it has to be ingested in food, or alternatively synthesized by the intestinal bacteria, or by any ingested probiotic that could use dietary linoleic acid to generate CLA. The best source of CLA is fat from ruminants, however since consumption of fat from ruminants is usually not recommended by nutritionists (due to its high concentration of saturated fatty acids) the ingestion of a CLA-producing bacteria could be an option for maintaining and supplementing levels of CLA in the gut and thereby positively influence health. Our research investigates the degree to which bacterial CLA production contributes to the anti-inflammatory and anti-cancer probiotic properties associated with Bifidobacteria. Furthermore we investigate the mechanism of the actions underlying bacterial-produced CLA on human gut cells for the purposes of scientifically validating health claims associated with CLA.

By Rebecca Wall,
APC, Teagasc, Moorepark Food Research Centre



Understanding Coeliac Disease

Coeliac disease is a condition of the digestive system that affects the small intestine, which results in varying degrees of malabsorption and diarrhoea.

Coeliac disease occurs when the body reacts abnormally to gluten, a protein found in wheat, rye, barley and oats. When someone with coeliac disease eats foods containing gluten, their immune system causes an inflammatory response, which damages the lining of the small intestine, and thereby reducing the person's ability to absorb certain nutrients. Coeliac disease is classified as an "autoimmune" disorder, as the body's own immune system causes the damage.

Coeliac disease is more common in the Irish and in those of Irish descent. It has been proposed that the present day prevalence of coeliac disease across Europe is related to the interaction between genetics and environment, e.g. advances of agriculture and historical patterns of cereal ingestion.

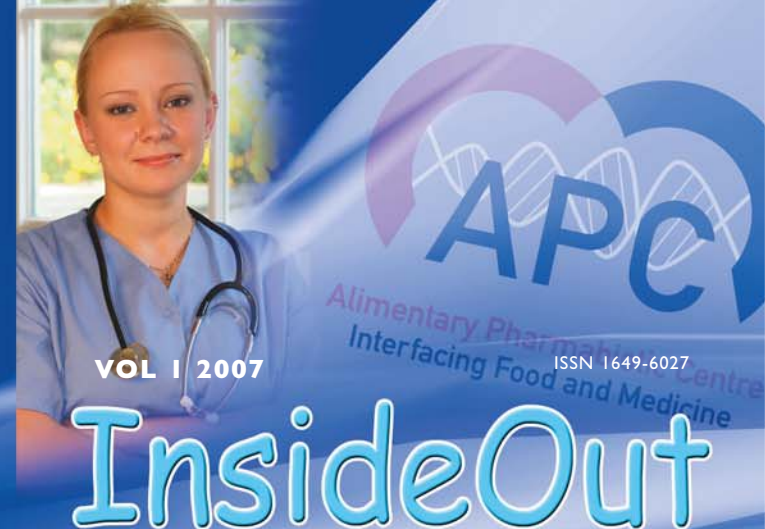
Approximately 1% of the population suffer from coeliac disease, experiencing symptoms such as diarrhoea, excessive gas, bloated abdomen, weight loss, weakness, irritability or depression. Many people remain undiagnosed because they may have been advised to stop eating wheat. This may improve their symptoms, but as a result they may never be diagnosed with the condition. Because coeliac disease has a hereditary influence, close relatives have about a 10% higher risk of being affected with the condition.

The only treatment for coeliac disease is a gluten-free diet. For most people, avoiding foods like breads, cereals, and pasta will stop symptoms and prevent damage to the intestines. Damaged villi can be functional again in three to six months.

**IF YOU WOULD LIKE TO RECEIVE FUTURE COPIES OF
INSIDEOUT, OR HAVE ANY COMMENTS, PLEASE CONTACT**
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InsideOut

Welcome to our third newsletter for patients and the medical professional community. We aim to give you a general overview of some of the research being conducted at the Alimentary Pharmabiotic Centre (APC). This issue is packed with interesting and informative articles and a profile of Dr Siobhan O'Mahony's work in the area of Irritable Bowel Syndrome.

Also, meet a sufferer of Crohn's disease and learn how she is living and managing her disease, through diet, exercise and a positive attitude.

To celebrate World Digestive Health Day, 2007, the APC will be running a Public Forum. Professor Eamonn Quigley, UCC will chair and will be joined by Mr Peter Cartwright and Dr Mary Rea, who will be speaking about Diverticular Disease & Clostridium difficile respectively. A special word of thanks to our sponsor, Yakult, for their generous support in funding all of our World Digestive Health Day activities. See <http://apc.ucc.ie> for more details.



Living with Crohn's Disease

- a patient's perspective

At the age of seventeen, weeks after completing my Leaving Certificate, I was diagnosed with Crohn's Disease. I began to feel unwell in the weeks leading up to the Leaving Cert, yet was adamant that I was going to continue and complete my exams. Initially, it was a huge shock to realise that I would have to live with Crohn's for the rest of my life and have it controlled with medication. However, I quickly learned to cope and adopted a positive attitude towards it, which I believe is crucial. The following September I started college and qualified three years later as a Primary School Teacher. There were times during these three years when I suffered flare-ups of the disease but I was determined not to let the Crohn's dictate the path I took in life.

Flare-ups can be quite debilitating and can make everyday life difficult. Personally, I find dealing with abdominal pain the most difficult. This tends to leave me quite tired and generally lacking in energy. At times such as this, I find it difficult to focus or concentrate on normal everyday activities. The simplest of tasks, that otherwise I would take for granted, seem to require a huge effort. After a day in the classroom, I sometimes need to spend time resting in order to replenish energy levels.

Learning to cope with Crohn's Disease has meant I've made some adaptations to my lifestyle. With regard to diet, I tend to eat small meals regularly as I find this easier than sitting down to a large meal. Although I have not eliminated red meat and dairy products from my diet, I have reduced my intake of these. They can be difficult to digest and I have found an improvement in my management of Crohn's since implementing this. I tend to eat fish regularly and plenty of fresh fruit and vegetables. I also would drink water often throughout the day. Obviously, these would benefit general health also.

From malabsorption of vitamins and minerals due to Crohn's Disease and also from the use of steroids to treat the disease in the past, I have developed Osteopenia. Therefore, weight-bearing exercises have been recommended to help improve bone density. For me, I find walking the most enjoyable form of weight-bearing exercise.

While in remission, life for me continues quite normally. Crohn's, however, is never far from my mind. The location of toilet facilities is something I have to consider when going to events, booking holidays etc. Food is another factor I have to consider to ensure I do not encounter difficulties in finding what is suitable for me.



Living with Crohn's Disease can be challenging, to say the least, but vital to coping with it is a positive approach and outlook.

For anyone recently diagnosed with Crohn's, I realise that it may all appear quite alarming but it need not be viewed as a 'life sentence'. I can honestly say that I have achieved everything I've set out to achieve so far and never found Crohn's Disease to be a stumbling block. Extra planning may be required before some decisions are made but this becomes a way of life after a while and I don't consider it to be an obstacle.

For those close to a Crohn's sufferer, it is important to understand the nature of the disease and how it affects the patient, both physically and mentally. Their help and support is invaluable on 'bad' days, even with trivial matters.

On June 4th, I intend to take part in the 25th Women's Mini-Marathon in Dublin to raise awareness of IBD and also to raise money for the APC, who carry out

fantastic work in this field. I also took part in 2005, and the APC team came to my school to give a presentation on the immune system to my 5th class students. For me personally, partaking in the Mini-Marathon gives me something positive to focus on with regards to my illness and I would encourage anyone who would like to help, to get running/ jogging/walking !!!!



Alimentary Pharmabiotic Centre
Interfacing Food and Medicine

The Alimentary Pharmabiotic Centre (APC)
in association with Yakult
celebrate

WORLD DIGESTIVE HEALTH DAY

Focus on Health - straight from the gut

Lecture Theatre G02

Brookfield Health Sciences Complex
College Road, University College Cork
Tuesday, May 29th 2007, 6.00pm – 7.30pm

- Topics include New Concepts in Digestive Health, Diverticular Disease, and *Clostridium difficile*
- Question & answer session

Admission Free • Everyone Welcome
See <http://apc.ucc.ie> for more details

Is Irritable Bowel Syndrome a miscommunication between the brain and the gut?

Irritable bowel syndrome (IBS) is a gastrointestinal (GI) disorder that affects approximately 20% of the population and is characterised by chronic abdominal pain and disordered bowel movement. Research has revealed that IBS symptoms arise through the miscommunication between the brain and the gut. The stress response system is one pathway by which the brain and the gut communicate. Stress is known to be involved in the onset and worsening of the symptoms of IBS.



There is evidence that IBS patients have a bacterial imbalance in the gut. Gut bacteria help the digestion and absorption of nutrients, produce much needed vitamins, participate in gut sensory and motor function and form an essential protective barrier in the gut. A disruption in the bacterial balance can affect the overall well-being of an individual and increase susceptibility to disease. Therefore, it is of benefit to the host to maintain increased levels of good bacteria such as bifidobacteria and lactobacilli, which have protective functions, at the expense of more harmful organisms. This justifies the use of probiotics as protection against intestinal disorders and diseases.

Stress plays an important role in the exacerbation of symptoms in IBS. Stress influences the amount and acidity of secretions in the gut and the motility of the gut. These physiological changes may be less favourable to the survival of bacteria such as lactobacilli. The aim of my research in the APC is to investigate the effects of early life stress on aspects of the brain-gut axis and to see if probiotic treatment can alleviate IBS symptoms. Probiotics have been found to relieve the symptoms of IBS. Studies have shown that the bacteria in the gut can influence the stress system and the correct balance of GI bacteria is necessary for the appropriate development of the stress system. Therefore, the impact of a balanced bacterial population in the gut may be farther reaching than the GI tract. Of course, further research into this area is necessary.

As there is no current satisfactory treatment for IBS, probiotics offer a safe and exciting potential new therapy for patients with this disorder.

By Dr Siobhan O'Mahony, APC