

The Story of Glyconutrients

Your Key to Optimal Health

Do you know that a deficiency in certain sugars could be causing illness? How can that be true? We all know that too much sugar is bad for us. It is only quite recently that scientists discovered a family of 'nutritional' sugars. Sugars that are found in plants, sugars that play an important part in the functioning of our immune systems, that boost kidney function and help prevent disease.

Scientists recognise that there is a direct link between disease and diet. The human body is an amazing machine that can heal itself of disease if it is given the proper nutrition that it requires. Conversely, the lack of appropriate nutrition in the diet can leave the body defenceless and susceptible to disease.

Our modern day lifestyle means we spend more money than ever before, on fast foods that have little or no nutritional value. Dietary deficiencies contribute to obesity and a myriad of other problems that have never been more prevalent.

Many of our foods are so processed that they contain no essential nutrients to feed the body's immune system. As a result our immune systems get weaker and lose the ability to combat disease. Our bodies are not designed to ingest and assimilate foods that have been irradiated and devitalised. Also, processed foods can be deficient in vitamins, enzymes, fibre, and essential nutrients. Packaged foods tend to be loaded with additives designed to give them an eternal shelf life. Fruit and vegetables are mostly picked too early and often gassed to ripen.

But, let's step back in time a little. It had long been recognised that the aloe vera plant was one of the world's most popular and well-known plants used for healing. It was evident, however, that commercially processed aloe did not produce the same level of health benefits that was achieved with the fresh aloe vera gel.

In the early 1980s, a group attempting to isolate the medically active ingredient from the aloe vera plant, hired a research pharmacologist, Dr Bill McAnalley, to find what caused the unique benefits of fresh aloe vera gel and why after processing, these benefits were no longer evident.

Dr McAnalley discovered, after lengthy research, that the active ingredient in the aloe vera gel was a long chain carbohydrate made up predominately of a sugar called Mannose. He also discovered that within a day or two after the aloe leaf is picked, this long-chain sugar molecule rapidly begins to disintegrate, causing the gel to lose much of its effectiveness. Dr. McAnalley then developed and patented a new way of processing the aloe vera gel that protected this long-chain sugar from being destroyed. This new stabilized aloe extract was then made available to the public in the form of a juice, and the testimonies began to flow.

People with all kinds of health problems began reporting their improvement after taking the new product, and scientists could see they had their hands on something significant.

Carbohydrate structuring was a brand new science at that time and was only being taught at one or two universities in the world. Soon, however, researchers the world over began to study carbohydrates and by 1990 there had been around 4000 papers published about Glycobiology. An article appeared identifying carbohydrates as essential for immune function, and glycobiology as one of the 'hottest' new fields of medical research. Harper's Biochemistry, 1996, devoted a chapter to reviewing the sugars necessary for cell-to-cell communication.

It was found that of the 200 carbohydrate monosaccharides, or sugars, found in nature, there were eight biologically active sugars (glyconutrients) that gave our cells their structural support network and were critical for cellular communication. These glyco or sugar forms work to keep our hormones in balance, fight off disease invaders, enable blood to clot and create a complex cellular messaging system.

The eight sugars that make such a huge difference to our cellular framework but which are mostly missing from our diets are:

GLUCOSE, which **is** readily available in our diets (converted from white sugar, fructose, & starchy foods), is the one we are most familiar with. It is also the worst for our health. This refined white sugar offers empty calories and in most cases is oversupplied in the form of sugar cane, rice, corn, potatoes, wheat etc.

Glucose is the ubiquitous saccharide. Table sugar is composed of glucose and another saccharide, fructose. Both saccharides reside in candy bars and cupcakes, ice cream and soft drinks. Bread, rice, pasta, vegetables, cereal, honey, corn syrup, and fruit also supply the sugar. A potent fast-energy source that can be released directly into the bloodstream, glucose also enhances memory, stimulates calcium absorption, and enhances cellular communication. Too much of it can raise insulin levels, leading to obesity and diabetes. Too little glucose can be problematic as well. Elderly Alzheimer's patients, for instance, register much lower glucose levels than those with organic brain disease from stroke or other vascular disease. In addition, glucose metabolism is disturbed in depression, manic-depression, anorexia, and bulimia.

GALACTOSE **is** also readily available in our diets. It is obtained from the conversion of lactose (milk sugar) & is also easily obtained from dairy products UNLESS you suffer from lactose intolerance.

Galactose is abundant in dairy products, where it coexists with glucose in a disaccharide called lactose. In animal studies, galactose inhibits tumour growth and its spread, or metastasis, particularly to the liver. The sugar also enhances wound healing, decreases inflammation, enhances cellular communication, and increases calcium absorption. Galactose supplementation helps protect mice exposed to X-ray radiation, from developing cataracts. Galactose levels are usually lower in people with adult and juvenile arthritis and in those with lupus. Studies also indicate that the saccharide triggers long-term memory formation.

FUCOSE **is not** readily available in our diets but is found readily in breast milk and several medicinal mushrooms. It has numerous well-documented benefits for the immune system.

*Abundant in human breast milk and certain mushrooms, **fucose** influences brain development. Animal studies using fucose indicate that the saccharide may also help improve the brain's ability to create long-term memories. Fucose is an immune modulator as well, inhibiting tumour growth and its spread and enhancing cellular communication. High concentrations of fucose are found at the junctions between nerves, in the kidney and testes, and in the outer layer of skin. Fucose metabolism is abnormal in cystic fibrosis, diabetes, and cancer and during episodes of shingles, which is caused by a herpes virus. (Shingles is a reactivation of dormant chicken pox virus.) Studies suggest the sugar is active against other herpes viruses, including herpes and cytomegalovirus. The saccharide also guards against respiratory tract infections and inhibits allergic reactions*

MANNOSE is not readily available in our diets. It plays a profound role in cellular interactions and has been known to lower blood sugar levels. It is absolutely vital for proper immune defences against microbial invaders, and it has a natural anti-inflammatory effect.

Mannose is a major player in tissue remodelling and intelligent interactions between cells. The addition of mannose to your diet can accelerate the processes of cellular communication and healing; inhibit tumour growth and spread; and prevent bacterial, viral, parasitic, and fungal infections. It's necessary for the production of cytokines (the chemicals that make us feel achy when we're sick, which the body produces to fight invaders). Research suggests that mannose also eases inflammation in rheumatoid arthritis, and studies on lupus patients indicate a deficiency in this saccharide. Mannose also lowers blood sugar and triglyceride levels in diabetics.

XYLOSE is not readily available in our diets. It is often seen in sugarless gums, candies, etc because it has a sweet taste but does not cause tooth decay. It has recently been added to nasal sprays and appears to discourage the binding of allergens and pathogens to mucous membranes. It also has known anti-bacterial and anti-fungal properties and may help prevent certain cancers.

*An antibacterial and antifungal, **xylose** also fosters cellular communication. Research suggests that xylose may help prevent cancer of the digestive tract. Xylose absorption is decreased in some patients with intestinal disorders, including colitis. For diabetics and others watching their sugar intake, manufacturers often substitute xylose for sucrose and corn sweeteners in chewing gum and toothpaste. Unlike these sweeteners, xylose does not cause dental cavities.*

N-ACETYL-NEURAMINIC ACID is not readily available in our diets but is another sugar that abounds in breast milk and dramatically impacts brain function and growth. It, too, boosts immune function and has documented anti-viral actions. Interestingly, in certain disease states, the ability to digest this sugar is impaired.

*Particularly important for brain development and learning, **N-acetylneuraminic acid** is, not surprisingly, abundant in breast milk. Animal studies indicate that the essential saccharide also improves both memory and performance. In addition, it's an immune modulator that affects the viscosity of mucus, which in turn repels bacteria, viruses, and other pathogens. In several in vitro (Latin for "test tube") and animal studies, the saccharide has been shown to inhibit strains of influenza A and B viruses more*

effectively than such prescription antivirals as amantadine and ribavirin. It also influences blood coagulation, brain development, and cholesterol levels, lowering LDL, the so-called bad cholesterol. The processing of this sugar is disturbed in Sjogren's syndrome and in alcoholics. In general, levels of this saccharide decrease as we age.

N-ACETYL-GLUCOSAMINE **is not** readily available in our diets. It is particularly beneficial for cartilage regeneration and joint inflammation. Glucosamine, a well-known natural medicine for arthritic conditions, comes from this sugar compound. It has many additional therapeutic effects, and deficiencies or malfunction of this sugar have been linked to diseases of the bowel.

N-acetylglucosamine is an immune modulator with antitumor properties and activity against HIV. Glucosamine, a metabolic product of N-acetylglucosamine, helps repair cartilage, decreases pain and inflammation, and increases range of motion in osteoarthritis. In addition, the saccharide is vital to learning. In one study, researchers found that after two groups of mice received glucosamine injections, the group given fifteen minutes' worth of avoidance-conditioning training (in which they were punished by electric shock for responding to some stimuli and rewarded with food for responding to others) incorporated nearly double the amount of glucosamine into their brains as the mice that were not trained and were kept quietly in a cage. Glucosamine may also help repair the nmcosal-lining defensive barrier called the glycosaminoglycan layer, or GAG layer for short. Defects in the GAG layer have been implicated in Crohn's disease, ulcerative colitis, and interstitial cystitis.

N-ACETYL-GALACTOSAMINE **is not** readily available in our diets. It is the least known of the essential sugars although it appears to inhibit the growth of some tumours, and like the other sugars, plays an individual role in keeping cell communiqués clear and promptly delivered.

Although research on N-acetylgalactosamine has been limited, we do know that the saccharide inhibits tumour spread and enhances cellular communication. Lower-than-normal levels of this sugar have been found in patients with heart disease.

From "Miracle Sugars" by Rita Elkins,
"Sugars That Heal" by Emil Mondoa M.D.

Glyconutrients are an exciting scientific discovery. Drug companies are now spending BIG money trying to synthesize saccharides and create new saccharide molecules that they hope will become the drugs/medicines of the future.

There are a number of companies that offer supplements containing glyconutrients, which include some or all of the eight essential glyconutrients. To date there is only one supplement, called **Ambrotose** that includes all eight of the essential saccharides. Ambrotose has been patented by a publicly listed US company called Mannatech. Mannatech produces several vitamin/mineral supplements containing Ambrotose. The glyconutrients in Ambrotose are all extracted and stabilized from natural sources and their products are all manufactured to the highest standard, using only the best quality ingredients available.

More and more people are now taking control of their own health and wanting to avoid the use of pharmaceutical drugs where possible. They realize the important link between proper dietary supplementation and creating optimal health. People also, are beginning to understand that not all natural health supplements are created equal.

Many people already supplement with vitamin pills with the hope of improving health, but this is not always enough to satisfy our nutrition needs. This is a widespread problem within the health supplement industry. The challenge has been getting the right combination of vitamins, minerals and herbal pills to give your body exactly what it needs. In addition most vitamin pills do not dissolve easily in the body and the active ingredient is often not stable upon manufacturing. This renders the product ineffective and useless by the time it reaches the consumer.

The answer is to have a natural food supplement which can be readily utilised by the body and contains the nutrients the body requires to maintain optimal health.

Glyconutritional products will play a leading role in the 21st century's emerging wellness industry. The driving determinant will be the growing realization that optimal cell-to-cell communication is one of the most critical functions of the life process and is fundamental to immune system health.

It is worth remembering that Glyconutrients are not drugs and are not a cure for any particular illness. All they do is help the body to function normally (as it should) so *the body can heal itself*. Accurate communication between cells is VITAL for proper health and to synchronize many bodily functions. The absence of one or more of the eight essential saccharides can manifest in the body in the form of illness or immune system malfunction.

It should be noted here that the body **is** capable of producing those sugars that are lacking if all is balanced and well with the cellular structure. If, however, the body is compromised in any way, then it would seem prudent to add the eight vital sugars in supplement form.

Including glyconutrients in our diets and/or taking glyconutrient supplements (just like we take vitamin and mineral supplements) is a way **of helping to maintain proper health and longevity by boosting and assisting the immune system to fight bacteria, viruses and parasites** and to **overcome and recover from many illnesses**.

There are many excellent books available about Glyconutrients and a myriad of papers have been written and clinical trials are continually being conducted. In the meantime there are many thousands of people who are using Glyconutrients with amazing results.

It is important to remember that Glyconutrients are extracted from natural food sources. Mannatech was one of the first companies in the world to recognise the importance of natural, food-based sugars in the diet, to provide these sugars in the form of easy-to-take, cost-effective supplements and to apply for (and be granted) international patents based on the results of glyconutritional research.

Mannatech's number-one commitment has always been to deliver a quality product consisting of the richest plant sources necessary for the body to perform at its peak. They have invested more than US\$1.5 million in a state of the art research and development laboratory, have developed assays designed to assess the components of tested materials ensuring that only the best raw materials are used and have always followed the Good Manufacturing Practices that are now demanded by new regulations.

Many Doctors and Health Professionals agree that Glyconutrients are changing the way we think about health and wellness. I'll close this report with a few comments from just some of these Professionals.

Dr John Axford, MD has been a member of the Faculty at St. George's Hospital Medical School, University of London, first as Senior Lecturer in Rheumatology and, since 1998, as a Consultant and Reader in Rheumatology & Clinical Immunology. Currently, Dr. Axford is the principal investigator for two three-year clinical trials funded by Mannatech at St. George's Hospital. He is quoted as saying *"Sugars are going to be the molecules of the next decade. Glycobiology is one of the last frontiers of science to be conquered and it's going to be at the cutting edge of a large number of discoveries and therapies over the next decade...."*

Dr Rob Ortmann, MD Immunologist and Research Scientist. *"I really believe that glyconutrients are something that will become mandatory for overall health, and the reason I have come to this conclusion is because I have spent the past several months doing what I call research on research. And when I would do searches on glyconutrients, and especially on a lot of different disease processes, I was floored by the number of quality studies that are out there that have shown such benefit and promise in a myriad of diseases ranging from diabetes to arthritis."*

Dr Michael Schlachter, MD Board Certified Internal Medicine and Pulmonary Disease Clinical Instructor says *"The biggest revolutionary change in the war against disease is represented by glyconutrients. If you do not want to become a patient (and therefore a statistic) you need to answer in your own mind and heart if what you are doing for your health is optimal, and if not what else can you do."*

Dr Walther W. Meyer, MD, CMD *"Most doctors, like me, have had little training in nutrition. Even though we frequently suggest a good diet – good nutrition – we really have not done a good job of defining what that term means"*.

Noni Kaufman, DSHEA certified Nutrition Consultant says *"The most important discovery of this century for the immune system may be something called glyconutrients. Glyconutrients, available in a food nutrient complex called Ambrotose, are at the forefront of nutritional science and biochemistry research. They are not vitamins, minerals, herbals, homeopathics or enzymes. They are a class all to themselves."*

Jane Aslett

<http://www.wellness-decisions.com>