

# The Road to Health is Paved with Good Intestines



The gut is home to over 1000 different species of microbes, with an estimated 100 million to one trillion cells per millilitre located in the large intestine alone.

Sometimes referred to as the “hidden metabolic organ,” the gut microbiome is the largest, most dense, diverse and well-studied of all the human microbiomes.

Did you know that over 70% of your immune system lives in your gut? The health of your gut bacteria and the health of your immune system are intrinsically linked. When your gut bacteria are balanced, your immune system is also balanced.

With this in mind, it stands to reason that keeping your gut healthy is vital to overall health and well-being.

In fact, recent scientific studies have shown that gut microflora influences not only the immune system but also genetic expression, brain development, mental health and memory, weight and the risk of numerous chronic and acute diseases.

\*\*\*

## Nucleotides and the Gut

During the last three months of pregnancy, antibodies are passed from the mother to the child so when born, they are protected with an inherited immunity which typically lasts up to six months depending on the health of the mother. Crucially, through breastmilk, babies take on board nucleotides which are vital to help normalise microflora and therefore help the immune system thrive beyond that which has been passed from the parent.

Many infant formulas now contain nucleotides because studies have shown that babies fed nucleotide-supplemented infant formula experience better growth and development, maintain a healthier immune system and have increased levels of beneficial intestinal bacteria which reduce gastrointestinal distress.

Nucleotides exist in all living organisms.

In fact, every cell in your body contains them – over a billion per cell. Nucleotides are important for many biological functions, including their role as the building blocks of DNA and RNA.

The body has an on-going demand for new cell production. Adults must create new cells at a rate at least sufficient to replace the cells that die. To do this the cell and its DNA divides to form two new cells. This cell proliferation is a lengthy and complicated process, dependant on energy and the supply of all five specific nucleotide building blocks to build the DNA and the RNA molecules in the new cells

The rate of proliferation of cells found in the intestinal lining, known as the epithelial cells, are higher here than elsewhere in the body. That means that cells are constantly being created to replace damaged or lost cells, every three to five days to be precise.

This turnover of cells is so high, the body requires assistance via dietary intake as whilst the body can make nucleotides itself or salvage them from dying cells, certain types of cells require supplementary nucleotides provided in a person's diet.

Beyond breast milk, nucleotides are typically found in foods which are far less common in the modern diet. Meals containing tripe, liver and kidneys provide high levels of nucleotides but typically, these are not foods which are consumed today and especially not for vegetarians and vegans.

Unlike some vitamins and minerals, nucleotides are not yet considered essential nutrients for humans but poor diet, stress, chronic illness and the excessive use of antibiotics and alcohol all increase the body's need for nucleotides in order to facilitate regular and effective cell proliferation.

Both innate and acquired immunity need rapid and unhindered cell proliferation for proper functionality. Unfortunately, cells of the immune system lack the potential to synthesise nucleotides themselves. Importantly, nucleotides do not stimulate innate or acquired immunity but rather provide the resource for unhindered cell proliferation, gene expression and response to special environmental and physical challenges.

Their universal use and fundamental functionality and efficacy in every living organism make nucleotides a valuable management tool for many stress and health related conditions

## Nucleotides and Potential Benefits

For people with celiac disease supplementing with nucleotides could be highly beneficial to assist the small intestine repair from inflammation damage and promote villi growth.

For endurance and performance athletes, nucleotides are essential for muscle function. Besides protein synthesis, they improve oxygen transport and reduce the effects of lesions in the intestinal tract and muscles, potentially decreasing recovery time and the impact of high intensity activity. Indeed, much potential exists for the use of nucleotides in a sports person's supplement regime. By supporting a more rapid turnover of immune, digestive, muscle and blood cells, along with improving anabolic vs. catabolic drive, this "new" type of nutrient can be a real support to the training and recovery processes of a serious athlete.

For those susceptible to the flu virus, if the nucleotide supply is insufficient, the viruses will proliferate unhindered, which may lead to more severe symptoms and prolonged illness. Conversely, with enough nucleotides the infection can be quickly counteracted during its initial stages.

Studies have shown that nucleotides can help reduce cortisol accumulation and therefore reduce stress. Whilst in small quantities cortisol is helpful, continued stress raises cortisol levels beyond what is considered healthy and this slows the production of "good" prostaglandins. "Good" prostaglandins support immune function, dilate blood vessels, inhibit "thick" blood and are anti-inflammatory. (This is an area of research that Pro Bio Ltd, Switzerland, along with Nucleotide Nutrition Ltd, have been pioneering.)

New research suggests that a new way to prevent precancerous cells from developing could be to increase the amount of available DNA building blocks, nucleotides, so that the DNA could be synthesised properly and with fewer additional mutations.



in conjunction with

