

Zespri health bulletin

Nutrition and Immunity 101

How Nutrition Can Influence Your Natural Protection

An important part of being healthy is our ability to fight off illness and for the body to protect itself internally against the ordinary stresses and strains of life. This is what our immune system does and there is a direct link between how well our immune system functions and the food we eat.

Nutrients such as vitamins, minerals and antioxidants are required by the body to activate protective processes against external threats (e.g. infection and the effects of environmental toxins) or internal threats (damage caused by natural body processes like exercise and aging).

Kiwifruit are a superfruit and an excellent fruit source of vitamins, nutrients and phytochemicals. Kiwifruit, and some other fruits, have been shown to affect our immune system.

Our immune system is highly complex. It can be divided into nonspecific innate immunity and adaptive immunity.

Innate immunity (what we are born with) is our first line of defence and provides immediate defence against infection. It includes both cells and structures which have this function. For example, the skin and the lining of the digestive tract are part of the innate immune system, as each provides a barrier to infection.

Adaptive (or acquired) immunity includes a component of memory. Certain specialised cells in our body learn to recognise and remember specific threats and mount stronger resistance each time the same threat is encountered. The generation of adaptive or acquired immunity prepares 'defence' for any threats that may be encountered in the future. Vaccination is a good example of how the adaptive immune

system responds – by providing enough of a dose of disease for the immune system to learn how to respond, should the body be exposed to the same infective agents at a later date it can react more quickly and effectively to minimise the infection.

Some common terms you may come across when reading scientific studies on immune responses are defined below:

Antibodies or Immunoglobulins: Components on the surface of every cell which recognise other substances outside of the cell. Generally they recognise substances foreign to the body, and can launch an attack if the foreign substance is deemed harmful (pathogens). Generally they are tolerant to substances produced by the body, however in the case of autoimmune disease (such as rheumatoid arthritis), they can launch attack on the body itself.

In mammals there are five types of immunoglobulins: *IgA, IgD, IgE, IgG* and *IgM*. They differ in their properties, the location of their action and ability to deal with different antigens (eg, *IgE* levels are raised during an allergic reaction).

Antigens or Immunogens: Names for the substances recognised by antibodies. Possible antigens include pathogens, allergens and tolerogens.

Antigen-specific proliferation: A way of measuring the degree of immune response mounted in response to a particular antigen being introduced to a system.

Pathogen: An infectious biological agent (threat), (more commonly called germs), that can cause disease or illness.

Phagocytes: Cells which ingest and destroy

foreign matter using a process called *phagocytosis*.

White blood cells (also called *leukocytes*): Cells of the immune system, found in the blood and lymphatic system. They include:

- *Lymphocytes (B cells, T cells and natural killer cells):* *B cells* make antibodies that bind to pathogens to enable their destruction. *T cells* coordinate the immune response and are able to kill virus-infected cells. *Natural killer cells* are able to kill cells infected by a virus or cancer
- *Neutrophils:* Act against bacteria and fungi by ingesting them (phagocytosis)
- *Monocytes:* Like neutrophils, they ingest and destroy pathogens, but they also present pieces of the pathogen to T cells, so that the pathogen may be recognised again and killed
- *Macrophages:* Monocytes that have moved out from the bloodstream into the body tissues
- *Basophils:* Chiefly responsible for the allergic and antigen response by releasing the chemical histamine, causing inflammation
- *Eosinophils:* Deal with parasitic infections and are involved in allergic reactions.

Defensins: Small proteins present on the surface of many immune cells which are active against bacteria, fungi and some viruses.

Cytokines: Substances often released by immune cells (which have encountered a harmful substance or pathogen), as a way to activate and recruit more immune cells and increase the system's response to the pathogen. This process is also called *inflammation*.



For the love of your body.