

## IMMUNE

It was back in 2008 that I decided that I needed to formulate a powder that could help with immune enhancement, energy levels and overall protection.

I had been working with a number of cancer specialist helping their patients through the various forms of treatment especially Chemotherapy, but the problem that often occurs is the patient loses his or her appetite which results in weight loss and energy so often has to stop or halt the treatment. The other problem is the treatment kills the good cells as well as the cancer cells damaging the immune response.

So with this in mind, I developed a natural dairy based food formula that is easy to take and tolerated, tastes pleasant and contains no added sugars, artificial ingredients or fillers. I also found that as a formula for recovery after illness the benefits were in its immune enhancing properties and full nutritional profile. Not only as a daily powder for older people to gain the benefits of added protein in their diets, which is very beneficial after the age of 50 years to help maintain optimal health but also the health benefits are for the entire family.

I based my formula on whey protein concentrate as many studies cited show the benefits this has on immune enhancement. I also included casein and pea protein to balance the whey and completing the amino acid profile as well as oats in the form of rolled oat powder, with its own natural source of Beta Glucan which has shown to greatly benefit the pre and pro biotic effect in the internal gut biome and flora where over 40% of the immune systems response is made.

**IMMUNE** contains Whey Protein Concentrate, Whole Milk Powder, Casein, Pea Protein, Oats, Inulin, Coconut Oil, Natural Vanilla Flavour, Guar Gum, Luo Han Guo (Monk Fruit)

Over the last decade, natural health products have been the subject of immense infatuation in the scientific community, in particular with immunologists. Numerous recent studies have demonstrated important effects on all facets of immunity – from the stimulation of innate and adaptive immunity, to an anti-inflammatory effect of these products. In many of these enhancing health products, whey proteins and whey peptides are present, which, for many years, have been well known for their benefits on energy, sport endurance, protection against cancers, and serum lipid-lowering effect. Recently, this class of product has gained interest from immunologists who support the ever increasing body of evidence regarding their beneficial effects on the immune system.

Our South Australian pure Whey Protein has a balanced amount of proteins, carbs, and fats to supply energy. With a very high nutritional value, it is one of the best dietary sources of high-quality protein, highly digestible, and absorbed quickly and effectively at moderating blood sugar levels.

In a review, I noted (Patel) et al<sup>1</sup> looked at the nutraceutical benefits of whey proteins on human immune response. Continuing in the same vein (Sharma and Sharma) et al<sup>2</sup> went further into the overall nutritional benefits of whey proteins and casein on human health as well as overall immunity.

(Yalcin) et al<sup>3</sup> in his 2007 review looked at the overall benefits of whey protein which contain all the essential amino acids and have the highest protein quality rating among other proteins, with scientific evidence and recent findings related to the therapeutic potential of whey proteins and peptides to the overall benefit of the immune system.

One of the largest immune suppressing virus and infections in recent years has been HIV (P. Micke, K. M. Beeh, R. Buhl) and I. (J. F. Schlaak) et al<sup>4</sup> which is characterised by an enhanced oxidant burden and a systemic deficiency of the tripeptide glutathione (GSH), a major antioxidant.

The study had very positive results showing that Oral supplementation with whey proteins increases plasma glutathione levels of HIV-infected patients. While on the nutraceutical benefits (Causey, J. Fulcher, RG) et al<sup>5</sup> focused on the overall benefits of Beta Glucan as per rolled oats and its beneficial effects on the immune system and the enhancement as well as a reduction in the risk of Type 2 Diabetes, increasing the satiety response to assist in weight loss and improvement in good cholesterol (HDL).

(Thakur Abhimanyu Joshi V.K., Thakur N.S.)<sup>6</sup> in their conclusive and exhaustive study showed the benefits of whey proteins, casein and the full spectrum on amino acids gained from such foods in the maintenance and improvement of the human immune system. Casein is a protein powder that is slowly absorbed (up to 12 hours) and releases amino acids slowly, so can be taken before bed to help with recovery and reduce muscle breakdown. Several studies have shown it helps boost muscle growth, fat loss and many other health benefits. It is naturally rich in Branch Chain Amino Acids and Essential Amino Acids.

The choosing of a plant based protein was used and without doubt the humble pea met all my requirements it has a nearly complete peptide and amino acid profile as well as high levels of protein. (Huan Li†Rotimi E. Aluko) et al<sup>7</sup>. Pea Protein is rich in the amino acid Lysine and it's essential for building connective tissue like skin, cartilage, and bones. It has also been shown to help absorb calcium, another must for strong bones which has been shown for its ability to help balance blood glucose, as well as its ability to increase muscle strength, reduce anxiety and strengthen the immune system. Pea Protein contains 39% daily value of iron and easy to digest.

With the inclusion of South Australian natural oats to gain the maximum benefits and health giving qualities of Beta Glucan as shown in Physiological effects of beta-D-glucan rich fractions from oats (Anderson, J.W. Braaten, J.T. Cave, N.A.) et al<sup>8</sup>. Oat bran is particularly rich in beta-glucan. This article reviews studies which measure the physiological effects of the beta-glucan rich fraction of oats. The method of preparation of the beta-glucans is described and the physicochemical and analytical data are provided. The effect of oat gum on serum cholesterol levels and on blood glucose and insulin levels are given for rats and humans. Oat Beta-Glucan: Its Role in Health Promotion and Prevention of Diseases as shown by (Cheickna Daou and Hui Zhang) et al<sup>9</sup> in their 2012 review conducted an overview of the recent advances into the health promoting potentials. Oats have been used medicinally to help strengthen and soothe nerves, balance the endocrine function, and nourish the immune system.

The good fats in coconut oil (in small amounts) may prevent blood sugar spikes and help you sleep peacefully as blood sugar/insulin spikes can disturb the sleep. Plus the nutrients in coconut oil help the body to produce good amounts of sleep hormones, treat insomnia and help the immune system. The Lauric acid in coconut oil is used by the body to make the same disease fighting fatty acids monolaurin which is a monoglyceride, a substance that assists (especially infants) from getting viral or bacterial or protozoal infections. Coconut oil also has antimicrobial properties all of which has been shown by (Enig, M. G)<sup>10</sup>

Sweetened with Luo Han Guo (Monk Fruit) a small fruit that has been used for centuries to help relieve sore throats and reduce phlegm. The fruit's mogrosides are said to be anti-inflammatory, and may help prevent cancer and keep blood sugar levels stable so safe for anyone with diabetes. High in antioxidants, Luo Han Guo may also protect against the "breaking down" of the body as you age, assist in preventing cholesterol oxidation, potentially reducing your risk for heart attacks and strokes, and preventing development of atherosclerosis, plus it also contains some vitamin C, which can stimulate production of white blood cells and collagen, helping the body's cells, muscle tissue and blood vessels. Rong Di, Mou-Tuan Huang and Chi-Tang Ho<sup>11</sup> have shown that reducing inflammation allows a greater affect and protection formed by the immune system and a greater ability for macrophage activity being large white blood cells that play a vital role in our immune system, having the ability to locate and eat particles such as bacteria and viruses.

Having a compromised immune system has a detrimental effect on human cognition and greatly increases stress and anxiety plus people who have a compromised immune system tend to get sick more often (Rob C Markus, Berend Olivier, Edward HF de Haan) et al<sup>12</sup> showed in the cognitive field of research that Whey protein improves cognitive performance in stress-vulnerable subjects. The negative effect of chronic stress on performance may be mediated by reduced brain serotonin function. A diet-induced increase in tryptophan may increase brain serotonergic activity levels and improve cognitive performance, particularly in high stress-vulnerable subjects.

**Table 1. Specific properties of whey proteins.**

Protein	MW (g/mol)	IP	Concentration			Other structural properties
			Milk (g/l)	Whey(g/l)	Whey (%)	
β-lactoglobulin	18,400	5.35–5.49	2.0–4.0	3.3	55–65	Presence of a hydrophobic region capable of binding to vitamin A and helping its absorption.
α-lactalbumin	14,200	4.2–4.5	1.0–1.5	1.2	15–25	Presence of a hydrophobic region that binds galactosyltransferase and aids lactose biosynthesis.
Lactoferrin	80,000	8.4–9.0	0.2	0.2	1–2	Presence of ferric ion binding sites, which permits Lf binding and the transport of iron – an important role in iron assimilation.
Immunoglobulin	80–900,000	5.5–8.3	0.4–1.0	0.5	10–15	Five categories of Igs: IgG1 (0.3–0.6 g/l), IgG2 (0.05–0.1 g/l), IgA (0.05–0.15 g/l), IgM (0.05–0.1 g/l) and IgE.
BSA	69,000	4.7–4.9	0.1–0.4	0.3	5–10	Important capabilities to bind fatty acids.

BSA: Bovine serum albumin; Ig: Immunoglobulin; IP: Isoelectric point; Lf: Lactoferrin; MW: Molecular weight. Adapted from [90–92].

**Table 2. Immunologic effects of whey proteins and peptides.**

Whey fraction	Reported effect
β-lactoglobulin (proteins)	Stimulatory effect on splenocytes Increase GSH
β-lactoglobulin (peptides)	Carrier of retinoic acid Contraction of ileum muscle Increase oral tolerance to whey
α-lactalbumin (proteins)	Increase IL-1α production by macrophages Induce apoptosis in tumor and immature cells
α-lactalbumin (peptides)	Modulation of B- and T-lymphocyte activities Stimulation of adherence and phagocytosis of macrophages Stimulation of oxidative burst response
Lactoferrin (proteins)	Inhibition of cytokines TNF-α, IL-1α and IFN-γ Anti-inflammatory effect on animal model Upregulation of cytokine IL-10 Stimulatory effect on lymphocyte proliferation Regulatory effect on myelopoiesis Promote the differentiation of T- and B-lymphocytes Increase NK cells, CD8+ cells, CD4+ cells Bind to CpG and prevent stimulatory effect on B-cells Stimulation of mucosal immunity through Peyer's patches Increase phagocytosis activity of neutrophils as well as IL-8
Lactoferrin (peptides)	Increase phagocytosis activity of neutrophils as well as IL-8 Bind to CpG and prevent stimulatory effect on B-cells Inhibition of IL-6 production by LPS Increase of apoptosis in leukemic cells lines via production of ROS by phagocytic cells
Immunoglobulins	Increase of GSH Activation of complement, increase of phagocytosis, prevent adhesion of microbes, neutralize viruses and toxins
BSAs	Increase of GSH Stimulatory effect on splenocytes
GMPs	Suppress proliferation of cells upon mitogens stimulation Stimulation of macrophages proliferation and phagocytosis

BSA: Bovine serum albumin; GSH: Glutathione; GMP: Glycomacropeptide; Ig: Immunoglobulin; IL: Interleukin; IFN: Interferon; LPS: Lipopolysaccharide; NK: Natural killer cell; ROS: Reactive oxygen species; TNF: Tumor necrosis factor.

Optimal Essentials IMMUNE can be made into a delicious smoothie hot or cold added to milk, soy milk or water or added to porridge and yogurt or baked into cakes and muffins.

As the name suggests, it is a natural fully Australian made food product using only the very best South Australian dairy foods and oats, carefully blended with no sugar, artificial sweeteners, flavours or preservatives.

We also added monk fruit powder for its therapeutic benefits such as its anti-inflammatory effects, reduction in Type 2 Diabetes and rich in vitamins and minerals, promoted by hundreds of years as natural sweetener and remedy to increase longevity benefits and its delicious richness of taste. With the inclusion of coconut oil - full of MTC's (good fats) and its overall benefits on health including lowering LDL cholesterol and raising the good cholesterol HDL, anti-fungal benefits, and also helps improve skin and hair and the immune system.

Added to that, pure South Australian milk powder, you will understand why Optimal Essentials IMMUNE is very good for the whole family, not only to help recover after illness but to protect your family's overall health every day.

From children to the elderly, it is as its name suggests - for the whole family. A complete family shake.

## HIGHLIGHTS

The most important immune effect reported for the majority of whey proteins and peptides is the stimulation of innate immunity via an increase in macrophage activity and interleukin-8 production.

Lactoferrin is the most studied of the whey proteins and its immune effects are diverse and dependent on the conditions for which it is used. For example, lactoferrin stimulates innate immunity in some conditions and could also exert anti-inflammatory effects in others.

Lactoferrin also exhibits effect on mucosal immunity via stimulation of Peyer's patches. This mucosal immunomodulation could be responsible for multiple reported systemic effects.

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Many studies demonstrated that whey plays a protective role against diseases such as gastritis, asthma, colitis, arthritis and atopic contact dermatitis.

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