NUTRITION

AND HEALTHY IMMUNE FUNCTION 2020

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POWERED BY PVM NUTRITIONAL SCIENCES

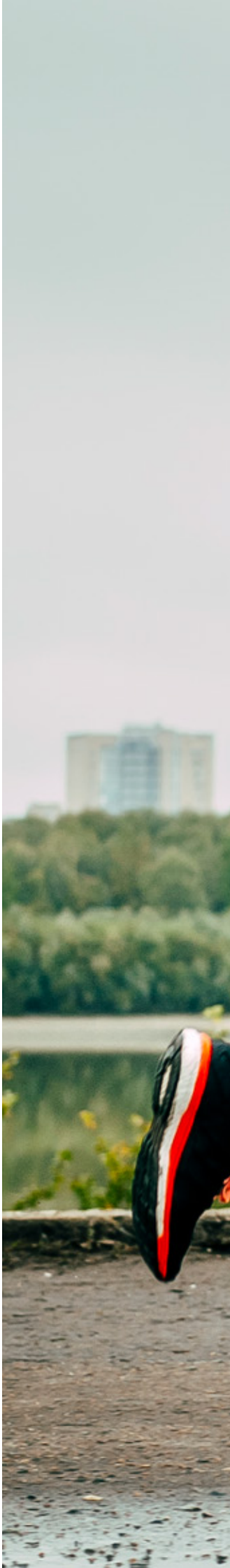
PVM HISTORY

A SHORT OVERVIEW

PVM stands for Proteins, Vitamins & Minerals.

The company was established in the late 1960's as a result of intensive scientific research undertaken by the National Institute of Food Research of the CSIR (Council for Scientific and Industrial Research). As a result, PVM Nutritional Sciences became one of the first companies to manufacture clinical nutritional products to combat severe malnutrition and produced the World's Original Energy Bar®, based on an earlier product devised to provide essential nutrition for military personnel in combat.

PVM Nutritional Sciences believes in a holistic approach and regard nutritional products as complementary to specific lifestyle requirements and good, balanced nutritional intake on a daily basis. Only within this context do nutritional products play a contributory, meaningful and scientifically valid role in health and performance.



FUELLING YOUR IMMUNE SYSTEM

Daily nutrition affects your immunity.

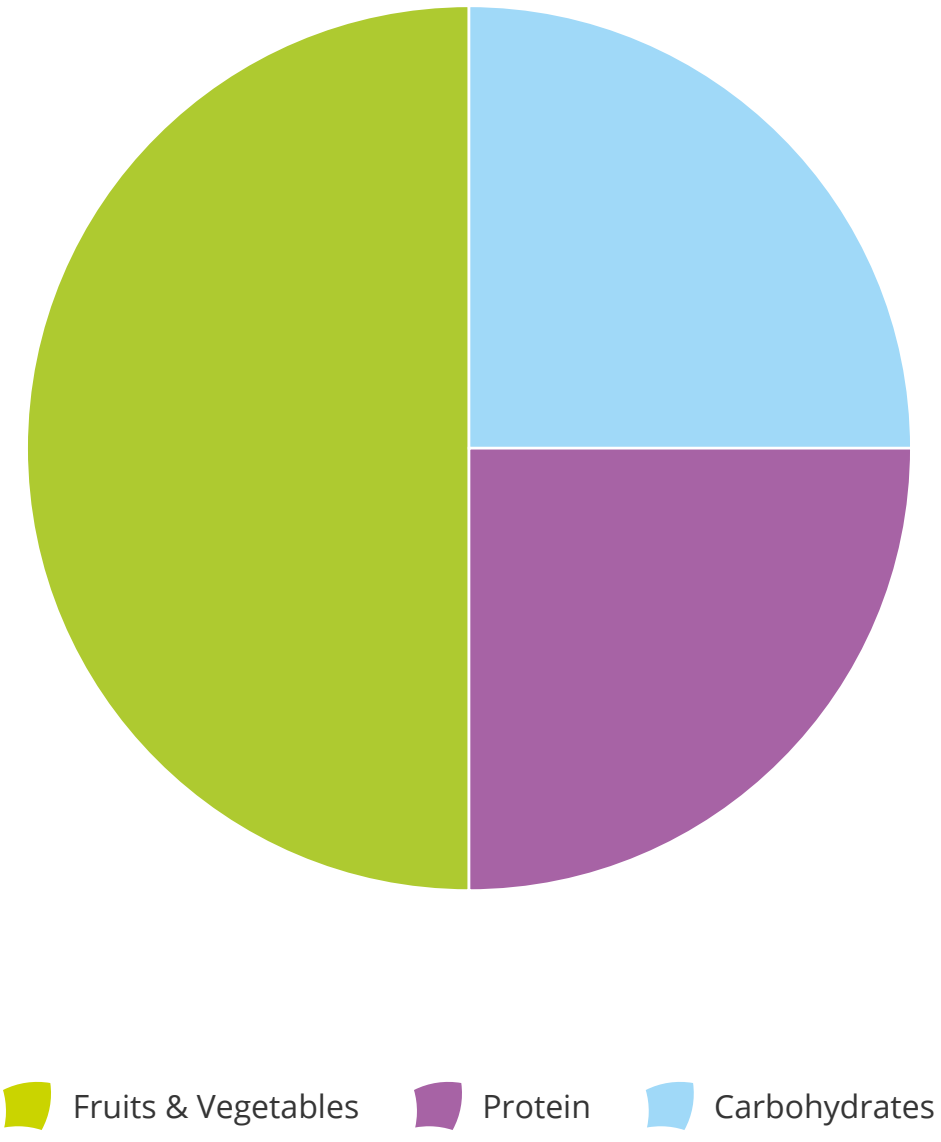
Your immune system is functioning at all times and can be divided into two general categories namely: the innate (natural) and adaptive (specific/acquired) immune system. Adaptive immunity becomes increasingly active during infections (pathogens).

This leads to an increased need for nutrients / energy substrates.

Deficiencies of the nutrients that play an essential role in immunity should therefore be avoided and balanced nutritional intake is important.

Balanced nutritional intake includes:
Carbohydrates *(starch and sugar)*
Protein *(amino acids)*
Fat
Micronutrients *(vitamins & minerals obtained from a variety of fruit & vegetables)*

Although dietary requirements depend on various factors like, gender, age, weight, body composition, height and physical activity, the plate model can be used to depict general guidelines for a balanced meal.



01.

ENSURE YOU CONSUME ENOUGH **PROTEIN**

The immune system is dependent on rapid cell replication and the production of proteins with specific immune functions such as antibodies. Adequate protein and energy is therefore required to keep up with the high demand of immune component synthesis. Proteins are also required for effective recovery / wound healing of tissue injuries which could open the door for pathogenic invaders.

Practical tips:

1. Ensure you consume proteins with each meal (breakfast, lunch and dinner).

2. ¼ of your plate should be protein. Protein sources include dairy, eggs, beef, chicken, pork, mutton, legumes, whole grains (contains only small amounts of protein) and vegetables (contains only small amounts of protein).

3. Ensure you consume at least one protein source per day that's higher in essential amino acids (amino acids that cannot be synthesized by your body) such as dairy, eggs, beef, chicken, pork, mutton or soya.

DAILY INTAKE OF **CARBOHYDRATES**

Carbohydrates contribute to your daily energy intake. The role of carbohydrates in various immune responses differs. Although these mechanisms are not well understood yet, preliminary research indicates that the intake of glucose (sugar) improves the outcomes of viral infections and the body's response to inflammation. In contrast the results also indicate that a decreased glucose (sugar) intake is beneficial during bacterial infections and certain parasitic (malaria) infections.

Carbohydrate sources such as whole grains, fruits etc. are also higher in fibre which are beneficial for gut health. The immune system of the gut also plays an important role in preventing and fighting infections within the gut, by providing a physical barrier (intestinal wall, mucus and acid in the stomach) and components of both the innate and adaptive immune system.

02.

Practical tips:

1. ¼ of your plate should be carbohydrates. Choose whole wheat, unprocessed carbohydrate sources like oats, whole wheat bread, starchy vegetables like pumpkin/ butternut/potato/corn, basmati rice and whole wheat/durum wheat pasta.

2. COVID-19 is a viral infection thus ensuring a balanced diet (not cutting carbohydrates) may help improve your body's response to the stress of an infection.

03.

DON'T FORGET ABOUT **FAT**

Fat contributes to your daily energy intake and is essential for the absorption of fat-soluble vitamins (vitamin A, D, E and K) all of which play a role in immunity. Foods that contain certain essential fatty acids contribute to a healthy immune system. Fat is more energy dense, therefore smaller amounts are recommended.

Omega 6 plays a role in immunity in that it promotes inflammation which is an essential part of the response to harmful pathogens. Linoleic acid which is a precursor for omega 6 is found in plant oils, corn and soybean. Linoleic acid forms part of the immune cell membranes and act as precursors for substances that promote inflammation.

Omega 3 on the other hand is known to have anti-inflammatory properties. The intake of omega 3 fatty acids may be warranted in people that follow a typical western diet which is poor in omega 3 fatty acids such as oily fish, flax seeds, walnuts, etc. A diet that is however very rich or excessively supplemented with omega 3 can decrease the normal inflammatory response. Balance is therefore the key, not too much and not too little.

Practical tips:

1. You can add small amounts of vegetable oils, peanut butter, nuts, seeds and avocado to prepare your meal or as a snack.

2. An optimal ratio of omega 6 to omega 3 fatty acids will support a healthy immune system. It is generally not recommended that people supplement their diets with omega 6 fatty acids because daily intake is mostly optimal.

3. Omega 3 can be supplemented if the diet contains very little omega 3 from oily fish such as mackerel, sardines, salmon or other oily fish.

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04. FRUITS AND VEGETABLES

Fruit and vegetables are vital sources of vitamins, minerals and fibre. Several vitamins are essential for normal immune function. Deficiencies of fat-soluble vitamin A, D and E and water-soluble vitamins folic acid, B6, B12 and C impair immune function and decrease the body's resistance to infections. Several minerals are known to exert modulatory effects on immune function and include Zinc, Iron, Magnesium, Manganese, Selenium and Copper.

VITAMIN	IMMUNE FUNCTION	DAILY INTAKE	MAJOR FOOD SOURCES
Vitamin A	Anti-infective vitamin which is required for both innate and adaptive immunity. Vitamin A is essential to maintain normal anti-body production to take care of pathogenic invaders.	900 µg /2500 IU/d	Liver, whole milk, cheese, carrots, green leafy vegetables, sweet potatoes, carrots, paw-paw, spinach
B-complex Vitamins	Needed for optimal total amounts of immune cells, and activation of these cells.	1.2-1.7 mg/d for each individual B-vitamin. 400 µg for Folic acid 2.4 µg/d for B12	Liver, lean meats, fish, poultry, legumes, green leafy vegetables, baked potatoes, bananas, lean meat, fish, poultry, whole grains, beans, broccoli, cabbage and oranges
Vitamin C	It protects the body against various infectious pathogens by acting as a potent anti-oxidant and improving the function of the immune system.	100 mg/d	Citrus fruits, green leafy vegetables, broccoli, peppers, strawberries, potatoes, all kinds of berries and kiwi fruit
Vitamin D	Immune cells have many receptors for vitamin D which indicates that it plays an important role in immune action/ activation. Vitamin D3 regulates the differentiation, growth and function of a broad range of immune cells such as monocytes, T and B cells.	15 µg/d OR 200-400 IU/d	Sunlight exposure, fish liver oils, sardines, herring, salmon and mackerel, eggs, meat, milk and butter
Vitamin E	Anti-oxidant vitamin that protects against free radical attack. It is responsible to stimulate natural killer cells.	15-30mg/d	Vegetable oils, margarine, green leafy vegetables, whole grains, egg yolks
Iron	Iron deficiency also impairs immunity as it is involved in chemical production. During the acute phase reaction, lowering of blood-iron levels is important to slow down the growth of iron loving bacteria. Chronic low iron levels are however not recommended.	15-18mg/d	Animal products, egg yolk, spinach and other dark green veggies, Liver, meat, fish, poultry, dried beans and peas, whole grains, broccoli, almonds, prunes, olives
Zinc	Zinc is an important mineral for keeping immune function intact. Deficiency causes increased susceptibility to a variety of pathogens.	15-45mg/d	Baked beans, peanuts, organ meats, meat, fish, poultry, dairy products, nuts, whole grains, vegetables, spinach, asparagus, pumpkin seeds and oats
Selenium	Selenium has a potent anti-oxidant activity and improves the immune defence of the body to fight against various microbes.	55-75 µg/d	Brazil nuts, oats, bran, barley, orange juice, turnips

VITAMIN	IMMUNE FUNCTION	DAILY INTAKE	MAJOR FOOD SOURCES
Copper	Copper is essential for secretion of chemicals that are involved in the proliferation of T-cells.	1.5-3.0 mg/d	Brazil nuts, walnuts, butter, barley, olive oil, coconut, garlic, papaya, apples
Iodine	Responsible for presentation of antigens to immune cells.	150-200 µg/d	Iodated salt, seafood, kelp
Magnesium	Deficiency is associated with reduced overall immune response.	350 mg/d	Almonds, whole-wheats, rye, soybeans, apricots, avocado, cheese, potato, sweet potato

Practical tips:

1. Do not supplement unnecessarily. Ensure getting adequate amounts from your diet (whole foods) by consuming at least 5 portions fruit and vegetables, as well as whole grains and dairy daily. Consume fruit during the day as a snack and add vegetables to 2 of your main meals per day.

2. Fruit and vegetables also contain non-nutritive compounds like phytonutrients that contribute to healthy immune function and various other health benefits. Each colour has their own benefits. Choose a variety of colours (eat your rainbow) to ensure you get various phytonutrients.

3. Supplementation should only be considered if you suspect that your diet contains inadequate amounts or you have a deficiency. Supplementation can further be considered during states of long-term immunity depression. The key is to correct deficiencies and/or ensure an optimal intake per day. When you do supplement, take care not to overdose (see 'too much of a good thing' discussed below).

4. If supplemented, vitamin C and E should be supplemented together since they act in a synergistic way to protect and enhance immunity.

5. When you choose a supplement like a multi-vitamin, ensure that vitamin D occurs in its active form which is vitamin D3.

6. Vegans can consider supplementing vitamin B12, as vegetable sources of B12 is not as bio-available as animal sources.

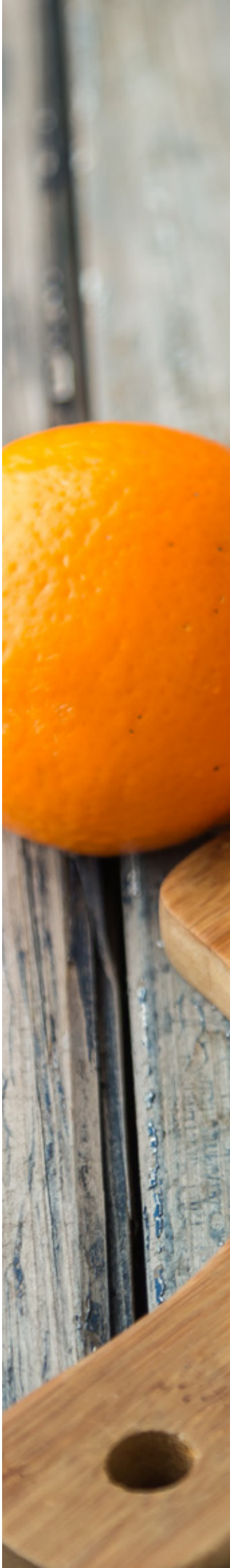
VITAMINS AND MINERALS

TOO MUCH OF A GOOD THING?

Consuming mega-dosages of individual vitamins or minerals, which appears to be a common practice, can however impair immune function and have other toxic effects (for e.g. iron, zinc, vitamin E). Convincing evidence for the consumption of mega doses of antioxidants to prevent common infections is limited.

Large doses of vitamin C can cause beneficial antioxidants to become harmful pro-oxidants. It is thus recommended not to consume more than 1000 mg Vitamin C per day in total (from supplements and food).

DO NOT use mega-doses of vitamins and minerals as far as possible.



05.

FLUID INTAKE

Water intake is important for the functioning of the body and allows all the defence systems such as the skin, blood, mucous and saliva to function smoothly, discouraging viral and other infections. Water also plays an important role in immune cell function and it carries oxygen to immune cells. Drinking adequate water will also assist the kidneys to function properly and remove toxins from the body.

Practical tips:

1. Dehydration is very common in infections. Avoid dehydration as far as possible.

2. Replace nutrients/electrolytes lost during dehydration. Important electrolytes include potassium, magnesium, sodium chloride, and phosphor.

3. Increase fluid intake during infections. Fluid guidelines differ between individuals, focus on drinking at least 1.5 - 2 litres fluid/day.

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06. PRE- AND PROBIOTICS

The balance of microflora in the gut is crucial to keep gastro-intestinal integrity intact and subsequently the absorption of vitamin, mineral and other micronutrients.

Probiotics are healthy gut bacteria that restore imbalances in the gut.

Prebiotics are non-digestible food components, typically carbohydrates (though not exclusively), which are selectively fermented by gut microbiota and has a proven beneficial effect on the body by selectively stimulating the growth and metabolic activities of probiotics.

Furthermore, beneficial microbiota found in the gut:

- Are responsible for the synthesis of some vitamins.
- The fermentation of fibres and other carbohydrates which are not digested in the upper gastro-intestinal tract. During this fermentation process, fatty acids produced help to maintain a healthy gut barrier.
- Compete with harmful bacteria for receptor sites along the intestinal wall.
- Lactobacilli (abbreviated as L.) can convert sugars to lactic acid that inhibits the growth of certain bacteria, while also lowering the pH of the gut.
- Bifidobacteria (abbreviated as B.) converts dietary fibre (prebiotics) to lactic acid that may help those suffering from lactose intolerance.

The benefits of probiotics have been marketed to range from lowering the risk of constipation, irritable bowel syndrome and diarrhoea to fighting general intestinal viruses and supporting the immune system.

Benefits of probiotics are however strain specific, in other words, certain strains need to be used under certain conditions.

Probiotics might be useful to help people recover from diarrhoea or constipation, especially if they used antibiotics.

Practical tips:

1. Prebiotics can be consumed on a daily basis and can be used to keep general immunity intact. Foods containing pre-biotics include bananas, onions, garlic, artichokes, asparagus, soya beans, chicory root and unrefined cereals (oats, wheat, barley).

2. Prebiotic fibre supplements containing inulin or b-glucan can also be consumed daily (within the recommended dosage).

3. Probiotic supplements aren't regulated in South Africa, thus you may not necessarily get the benefits you are paying for. If you choose to use a supplement, consult the label for its specific function and choose the correct one according to your present condition. Any one or more of the strains recommended below should occur in your supplement, preferably in levels above 10^8 CFU.

KEEPING HEALTHY

L. reuteri ATCC 55730;
L. casei DN-114001

IMMUNE SUPPORT

B. lactis HN019; B. lactis Bb12;
Lactobacillus casei DN-114001;
L. rhamnosus GG; L. plantarum;
L. acidophilus; B. lactis;
L. johnsonii;
Bifidobacterium animales

07. OTHER **GENERAL TIPS**

1. When taking penicillin, avoid use of caffeine, sodas and fruit juice as some drug-nutrient interactions occur.
2. In some cases, small meals and snacks may be better tolerated than three large meals.
3. Reduce life stressors as far as possible. Psychological and environmental stress like heat, cold, altitude, climate, pollution, physical stress like over-training, sleep deprivation etc., lead to impairment of immune cell function and can result in occurrence of disease.
4. Maintain good hygiene. Wash your hands especially after using public bathroom facilities.
5. Obtain adequate rest as it promotes rapid recovery. Don't sleep less than 6 hours or more than 10.
6. Exercise regularly and avoid overtraining. Exercise and breathing decreases stress hormone production. Exercise further increases sweating which is helpful in removing toxins from the body and improves general metabolism.
7. Zinc nasal gel and lozenges can reduce the duration and severity of symptoms of the common cold.
8. Avoid excessive consumption of alcohol as it inhibits the bone marrow's ability to regenerate blood cells, depletes B-vitamins and dehydrates the body – thereby suppressing the immune system.

PVM PRODUCTS

PVM ENERGY BARS – THE WORLD'S ORIGINAL ENERGY BAR

PVM launched the World's Original Energy Bar in the 1970's, based on an earlier product devised to provide essential energy and nutrition for military personnel in combat. Over 50 years, PVM has produced hundreds of millions of high quality PVM Energy Bars.

PVM produced the World's Original Energy Bar®, based on an earlier product devised to provide essential nutrition and energy for military personnel in combat. The PVM Energy bar is formulated according to the dietary guidelines of the institute of medicine (IOM) to provide a balanced nutritional energy snack. It's an ideal compact source of energy and nutrition, high in quality protein, anti-oxidants vitamin C & E and a minimum of 19% of the nutrient reference values for all other vitamins.

How does is it work?

- Provides **Energy & Nutrition**
- Supplies **Instant & Sustained Energy**
- Maintains **Blood Glucose Levels**
- Supports **Energy Metabolism**
- Improves **Focus & Concentration**
- Supports the **Immune System**
- Promotes **Recovery:**
  - Assist glycogen recovery
  - Support growth & maintenance
  - Anti-oxidants help repair oxidative damage induced by training

PERFORMANCE TRAINING AND NUTRITION

PVM PRODUCTS

PVM PTN RANGE

- All PVM products contain protein which supports the immune system as described above. The products are formulated with proteins of high biological value (whey, casein) that are naturally high in glutamine and branched chain amino acids (BCAAs). In addition, some products **(FUSION, FUSION MASS, OCTANE 4.0, OCTANE XTR and REIGNITE)** contain added L-glutamine.

- All PVM products (except for **PROTEIN XTR)** are fortified with additional vitamins and minerals, especially the anti-oxidants vitamin A, C and E.

- **FUSION DRINK** and **FUSION MASS** can be taken as a meal replacement as they closely mimic a balanced meal

- **FUSION MASS** contains added prebiotics in the form of inulin.

Please note that this is only approximate guidelines. For more individualised information or any other nutritional enquiries, please contact our Registered Dietitian for assistance or discuss this with your doctor.