

# IMMUNE HEALTH; A FUTURE FOCUS FOR FOOD AND BEVERAGES



## Tirlán

Tirlán is an ingredient solutions partner to some of the world's leading companies and brands. At the forefront of ingredient technology, we offer a range of solutions to match the ever-changing demands of the food and nutrition industry and its consumers.

With quality dairy and grains sourced from 5,000 Irish family farms, combined with advanced market research and insights, our unique platform offers fully traceable and sustainably produced natural solutions to help our customers stay ahead of the curve.

[www.tirlaningredients.com](http://www.tirlaningredients.com)



## What consumers want

The presence of the pandemic has, obviously, made consumers increasingly concerned about their health and the proactive measures they can take in order to stay safe and healthy, meaning that products that support the immune system are attractive beyond cold and flu season.

Prior to the pandemic consumer priorities for food and beverages were health and wellness, convenience and value. Since the pandemic consumer priorities around food and beverages have shifted, health & wellness and value have increased in terms of importance with trust & safety also becoming more important.

Consumers' health priorities have shifted from lifestyle to life protection and they now seek to improve their diets to boost immunity.

Immunity is becoming a key area of interest and consumers are actively looking for food and drinks that improve immune function. Consumers are taking a proactive approach to improving immune system functionality.



35% of US consumers think claims that support immune health would motivate them to purchase a nutrition or meal replacement drink.



47% of Thai consumers find immunity-improving functional benefits appealing when choosing food and beverages.



38% of Canadian consumers are interested in vitamins, minerals or supplements that help improve the immune system.

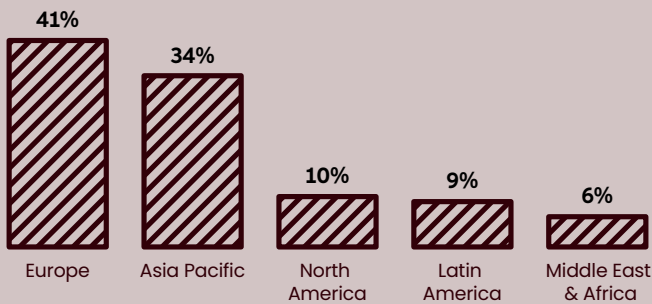


In Europe, a majority of individuals take vitamins, minerals or supplements to improve immune function, France 52% and Germany 67%.



The trend towards immunity boosting products has been growing and the European market has the most immunity-enhancing product launches in the last five years.

Global: % of food, drink & healthcare launches featuring immunity-enhancing functional claims, by region, Apr 2015–Mar 2020



# Dairy nutrition in support of immunity

## Dairy contains key nutrients which may influence the immune system

Dairy is a unique blend of nutrients that may include calcium, phosphorus, iodine, Vitamin B2 and B12, fermented cultures (yoghurt and cheese), bioactive peptides and high-quality protein containing all of the essential amino acids. 'The Dairy Matrix' hypothesis suggests that the nutrients in dairy can interact with one another in ways that are beneficial for health. This also includes some of the nutrients that support the immune system, such as vitamin B12 and folate, found in milk, cheese and yogurt, and vitamin A and zinc specifically for hard cheeses like cheddar.

## Nutrients and immunity

It is well established that nutrition plays a key role in supporting the health of the immune system; this is highlighted by the broad range of nutrients that have a role in optimising the health of the immune system.

Nutrients can be divided into 2 categories: macronutrients, and micronutrients.

**Macronutrients** are those nutrients that the body needs in large amounts. These provide the body with energy (calories).

**Micronutrients** are those nutrients that the body needs in smaller amounts.

# Micronutrients

Micronutrients are made up of minerals, vitamins and trace elements. Vitamins and minerals are required for a number of bodily functions including energy production, blood clotting bone health, fluid balance and immune function. Dairy is rich in a number of micronutrients which play a crucial role in maintaining a healthy immune system.



- ✓ Protein
- ✓ Zinc
- ✓ Vitamin A
- ✓ Vitamin B6
- ✓ Vitamin B12
- ✓ Vitamin D
- ✓ Folate
- ✓ Lactoferrin
- ✓ Immunoglobulin
- ✓ α-lactalbumin
- ✓ β-lactoglobulin

# Macronutrients

Macronutrients are nutrients that provide calories or energy and are required in large amounts to maintain body functions and carry out the activities of daily life. There are three broad classes of macronutrient: proteins, carbohydrates and fats.

## Protein

Milk naturally contains 3.5% protein (80% casein, 20% whey). Protein plays an important role in the immune response in that it provides amino acids and energy to make immune cells and other immune factors or components. Dairy proteins are complete protein sources, meaning that they contain all essential amino acids. These are nutrients that the human body cannot make, so are required to be sourced from the diet.

### Whey Protein




The efficacy of whey in supporting immunity has been shown in numerous cell and animal studies. There is some emerging evidence in human studies – although further research is required.<sup>12</sup>

## Dairy protein is also a rich source of bioactive components including α-lactalbumin, immunoglobulin, and Lactoferrin.

### Lactoferrin

Lactoferrin is one of the largest proteins found in milk. Lactoferrin has many roles in the body including having strong antioxidant, antibacterial and antiviral properties which can provide protection against certain fungal, viral or bacterial infections.<sup>4</sup>

It does this by binding with harmful molecules or micro-organisms to:

-  Damage them, e.g. break down their cell walls
-  "Starve" them of essential nutrients
-  Send signals to trigger an immune response

## Vitamin A

Vitamin A is required to maintain integrity of skin, eye, respiratory, gastrointestinal and genitourinary tracts. It is also required for anti-body producing immune cells.

## Zinc

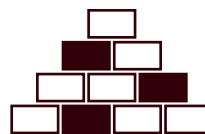
Zinc is required to promote the growth, maturation and activity of both innate and adaptive immune cells, such as NKC's and B and T lymphocytes.

## B6, B12, Biotin & Riboflavin

B vitamins are most widely known for their key role in energy metabolism, Proliferation is a key step in the immune response which requires energy to produce immune cells to protect against a foreign substance. Those following a diet, which minimises or removes dairy fully from the diet e.g. vegan, are unable to receive sufficient levels of Vitamin B12 through diet alone. As dairy is the main food source for Vitamin B12 and is not present in any plant-based foods it is recommended for this cohort to take a Vitamin B12 supplement to ensure sufficient levels.

Vitamin B6 & B12 contributes to normal function of the immune system. Riboflavin protects cells from oxidative stress. Biotin contributes to energy.

Whey proteins best-known immunomodulatory action is through stimulation of glutathione and glutamine production. Whey is a good source of the amino acids required for Glutathione production which contains glutamate, cysteine and glycine. Glutathione is a molecule which plays a role in protecting cells against oxidative stress. Oxidative stress is defined as an imbalance between the production of free radicals (that can cause illness) and the antioxidant system, which is in charge of keeping our bodies healthy. Having an adequate supply of Glutathione is essential to support immunity. The production of Glutathione depends on certain amino acids of which Cysteine is a particularly important one. Whey is one of the richest sources of Cysteine, so can help support adequate Glutathione production.<sup>3</sup> Tirlán's Avolon 625 WPC contains 2.3g of Cysteine per 100g Protein.



Essential Amino Acids, which are the building blocks of Protein, are needed to create immune cells.

### α-lactalbumin

α-lactalbumin is a natural whey protein containing a naturally high content of all essential and branched-chain amino acids (BCAA), making it a unique protein source. It may play a role in the infant gut development and therefore on the immune system.<sup>5</sup>

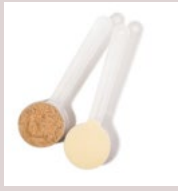
### Immunoglobulins (Ig)

Immunoglobulins (Ig) are antibodies that are created in the body in response to antigenic or immunogenic stimuli such as bacteria and viruses, and thus provide protection against microbial infections. Some research has shown that Ig can bind to pathogens and allergens limiting gastrointestinal inflammation suggesting it can reduce or prevent gastrointestinal infection.<sup>6</sup> Further clinical trials are required to confirm Ig's role in gastrointestinal infection.

## Conclusion

There are many different factors that can impact an individual's immunity, including underlying genetics, environmental factors, lifestyle, and nutrition. Although dietary factors may not be able to address all specific diseases or conditions, good nutrition can go a long way to help support and maintain overall immunity. Tirlán has a wide range of proteins, powders and knowledge which can help you with the development of your specific food and beverage solutions.

## Our portfolio



### Proteins

- Solmiko & Solago Milk Protein Concentrates & Isolates
- Provon Whey Protein Concentrates & Isolates
- Avolon
- Caseins



### Powders

- Skimmed Milk Powder
- Whole Milk Powder
- Butter Milk Powder
- Millac Fat Filled Milk Powder
- Lactose

# OUR UNIQUE DAIRY SYSTEM



### Grass fed cows

Outdoor grazing on nutritious grass for most of the year



### Cleanest air in Europe

Urban outdoor air pollution index



### Island location

On the edge of the Atlantic Ocean with plentiful rain



### Product quality

Multiple checkpoints from farm to factory



### Food authenticity

Produced honestly by safe family farms



### Clean label

Non-GMO, hormone-free, Kosher & Halal



### Cow & milk traceability

From grassland to customer



### Trusted Partner

Supporting leading global brands

# OUR R&D FUNCTION



### The Innovation Hub

Our Innovation Hub houses world class facilities enabling us to bring our concepts to life.



### Leading the way in process and technology

Functionalising and developing ingredients whilst always maintaining nutritional integrity.



### Our external ecosystem

Our extensive network of external partners ensures we are agile.



### Developed by our experts

Our team of experts passionately researching the worlds of dairy and plant.



### Providing superior nutrition

At Tirlán the foundations of nutrition are built on dairy and plant. Our ethos: "Good for You, Good for the Planet".

## References

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## Get in Touch

To find out more about how Tirlán can support you in developing your solutions, please contact us directly.

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