

What are micronutrients, and why are they important for our bodies?

Micronutrients are dietary components including vitamins or minerals, which are needed by the human body in small amounts and are essential for optimal physical and mental health.^{1,2} They have been described as ‘magic wands’ that help the body to produce enzymes and hormones needed for development and growth.²

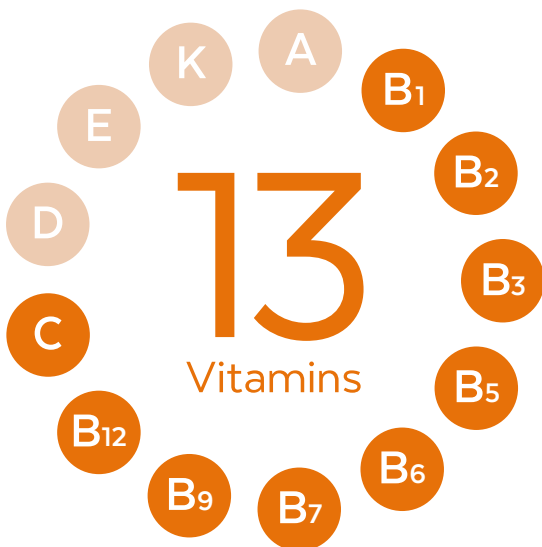
Various micronutrients including vitamins A, C, D, E, B2, B6, B12, folic acid, iron, zinc and selenium are essential for healthy immune function throughout the life cycle, and especially when we age as immunity tends to decline.³

Unfortunately, micronutrient insufficiencies are not a thing of the past, even in the developed world in the 21st century. An increasing number of people consume nutrient-poor food on a regular basis, which means that insufficiencies continue to exist^{1,4}



Healthy eating habits, providing an array of micronutrients alongside physical activity, can help to maintain health and reduce or prevent age-related chronic diseases.

Vitamins: what role do they play?



There are 13 essential vitamins that our bodies need. Four of these are ‘fat soluble’ and include vitamins A, D, E and K. Nine are ‘water soluble’ which includes eight B vitamins and vitamin C.

Every day we produce bone, muscle and skin, heal wounds, free energy from the food that we eat, and regulate our immune

systems. We also produce new red blood cells to carry nutrients and oxygen around our bodies.⁵ It is the vitamins that we consume daily that help with such processes.

Minerals: what role do they play?

There are 16 minerals that tend to be regarded as essential to health and wellbeing. They are: calcium, iron, zinc, phosphorus, magnesium, potassium, sulphur, sodium, chloride, copper, manganese, iodine, selenium, molybdenum, chromium and fluoride.

Sodium, chloride and potassium help to maintain the proper balance of water in the body, whereas calcium, phosphorus and magnesium are important for healthy bones. Sulphur helps stabilise proteins, including in our hair, skin and nails.⁵

Iron transports oxygen around our bodies; fluoride strengthens our bones and teeth; zinc aids blood clotting and enhances our immune response whilst copper aids iron metabolism and the creation of haemoglobin required for the transport of oxygen.⁴

Micronutrient profile: how does Quorn mycoprotein compare?

Quorn mycoprotein is a meat-free protein that can be consumed as part of a balanced diet.⁶ It is high in protein, low in saturated fat and high in fibre.^{7,8} Quorn mycoprotein also contains no trans-fat. It is a source of riboflavin, folate, vitamin B12, phosphorous, zinc, choline and manganese. It is also low in sodium and is free from cholesterol.

Quorn mycoprotein is a nutritious, sustainable protein source that can be consumed as part of a balanced diet.

The nutritional profile of different protein sources (per 100g)¹⁰

	Quorn mycoprotein*	Chicken breast: Meat only, casseroled	Beef burger: 98-99.5% beef, grilled	Pizza: Retail, cheese & tomato
Energy (kcal)	85	160	326	272
Protein (g)	11	28.4	26.5	12.2
Carbohydrate (g)	3	0.0	0.1	36.1
Fat (g)	2.9	5.2	24.4	9.8
Of which saturates (g)	0.7	1.5	10.9	4.1
Fibre (AOAC) (g)	6	0.9	0.7	2.9
Riboflavin (mg)	0.26	0.13	0.20	0.15
Vitamin B6 (mg)	0.1	0.36	0.31	NR
Vitamin B9 (folate) (µg)	114	6.0	10	4
Vitamin B12 (µg)	0.71	NR	3.0	0.4
Calcium (mg)	48	9	10	217
Phosphorous (mg)	290	210	210	179
Iron (mg)	0.39	0.5	2.5	1.09
Magnesium (mg)	49	25	22	24
Zinc (mg)	7.6	1.1	6.1	1.3
Potassium (mg)	71	270	380	223
Chromium (µg)	0.45	NR	NR	NR
Choline (µg)	180	NR	NR	NR
Manganese (mg)	4.9	0.01	0.02	0.40
Sodium (mg)	5	60	400	397

*Data provided by Marlow Foods (wet weight); NR, not reported

Micronutrient absorption: how does it take place and what are factors that influence it?

Fat-soluble vitamins enter the bloodstream via channels in the intestinal wall, which occurs after the fat-soluble vitamin-containing food has been digested in the stomach and small intestine. Many fat-soluble vitamins need proteins as carriers to be transported around our body. Fat-soluble vitamins can be stored in our liver and fat cells, being released when needed.¹¹

Water-soluble vitamins are absorbed directly into the bloodstream as food is digested and are easily transported around our body. Our kidneys regulate the level of these vitamins and remove excesses in urine.¹⁴

Where to find Quorn mycoprotein

Quorn mycoprotein is the unique whole food at the heart of every single Quorn product. There is a huge range of great tasting Quorn® products and ingredients available, all of which can easily be used to recreate your favourite recipes with a nutritious and sustainable twist.

Visit www.quornnutrition.com and www.quorn.com for more information about Quorn mycoprotein, products and recipes.

References:

1. Derbyshire EJ. *Front Nutr.* 2018;5:55.
2. World Health Organization. Micronutrients.
Available online at: <http://www.who.int/nutrition/topics/micronutrients/en/>. Accessed January 2020.
3. Maggini S, et al. *Nutrients.* 2018;10(10): pii: E1531.
4. Peter S, et al. *Nutrients.* 2014;6:6076–94.
5. HelpGuide. Vitamins and minerals.
Available at: <https://www.helpguide.org/harvard/vitamins-and-minerals.htm>. Accessed January 2020.
6. Derbyshire EJ, Ayoob KT. *Nutrition Today.* 2019;54(1): 1–9.
7. EC (2008) Commission Directive 2008/100/EC of 28 October 2008 amending Council Directive 90/496/EEC on nutrition labelling for food stuffs as regards recommended daily allowances, energy conversion factors and definitions. *Official Journal of the European Union.* L 285/9.
8. EFSA (2006) Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. *Official Journal of the European Union.* L 404/9.
9. Finnigan TJA, et al. *Curr Dev Nutr.* 2019;3(6):nzz021.
10. Public Health England. McCance and Widdowson's composition of foods integrated dataset on the nutrient content of the UK food supply.
Available at: <https://www.gov.uk/government/publications/composition-of-foods-integrated-dataset-cofid>. Accessed January 2020.
11. Medical News Today. Vitamin A.
Available at: <https://www.medicalnewstoday.com/articles/320310.php#vitamin-a>. Accessed January 2020.