Nutrition, Immunity and COVID 19

PLANT-BASED Health Professionals UK
Promoting Sustainable Health and Nutrition

Worldwide, the shadow of COVID has been lifting, however, it will likely never completely go away.
We outline **some of the factors** that contributed to its dramatic impact, offer insights into how we may **improve outcomes** from this disease as well as **look after our health and immune system.**

Diet

Large population studies have shown a link between diet and COVID

One study of almost **600,000** UK & US participants, showed a **9% lower risk** of contracting COVID, and a **41% lower risk** of severe COVID in those eating a **healthy plant-based diet**, with this effect especially strong in poorer communities[1].

A study from the UK Biobank of **500,000** participants showed **lower rates** of COVID in those consuming the **most vegetables and coffee**, and **higher rates** in those eating the **most processed meats**[2].

Chronic Health Conditions

A US study of over **900,000** patients hospitalised with COVID showed that, **63%** of their risk of hospital admission was due to **4 underlying conditions**; **obesity, hypertension, heart failure, type 2 diabetes**[3]. Similarly, UK, US and Canadian data have shown that up to **90%** of those who died of COVID had ***at least*** **one chronic health condition**[4,5,6].

Obesity[15], hypertension[16], high cholesterol[17], type II diabetes[18,19,20] are amongst the conditions best studied that can be *significantly improved* with a whole food plant-based diet.

- **Obesity** ***increases the risk*** of admission to the **intensive care unit**, and the risk of **dying** from COVID by up to **5 times**[7,8,9,10].
- **Type II diabetes** has been shown to be associated with ***more severe illness*** from COVID infection, including a ***higher risk*** of hospitalisation, ICU admission, and a **3 times higher mortality**[11].
- Cardiovascular disease increases the risk from COVID[12,13].
- A large Chinese analysis showed patients with **chronic kidney disease** have **2.22-fold** ***higher risk*** of developing severe COVID[14].

Microbiota

The *microbiota* refers to all of the microbes that live on or in us: bacteria, viruses, protozoa and fungi.

- The majority are found in our gut, and the type of bacteria we have ***depends on the food we eat***:
- The **good** bacteria that keep our gut healthy and ***support our immune system***, thrive on a diet rich in fibre, resistance starch and polyphenols. These nutrients are only found in plants. **Animal products** and **ultra-processed foods** *promote* growth of bacteria that contribute to **chronic inflammation**, the root cause of many **chronic diseases**.

- The health of the microbiota is ***integral*** to **overall health**[21], and to the **function** of the **immune system**[22].
- COVID has been associated with an **altered microbiota**[23, 24], which is associated with **severity of COVID**[25] and these effects may ***persist*** after infection, potentially playing a **role in long COVID**[26].

Immunity

- To support a well-functioning immune system, our bodies require sufficient **calories, protein,** a supply of **vitamins, minerals** and **antioxidants**, whilst ***avoiding*** **pro-inflammatory foods**[27].
- Important vitamins include: **A, B6, B9, B12, C, D, E.**
- Important minerals include: **zinc, copper, selenium, iron.**
- **Fibre**, ***only found in plant foods***, **supports the microbiota.**

- A **whole food plant-based diet** ***reduces sources of inflammation*** in the diet, while providing an abundance of anti-oxidants, vitamins, minerals and fibre, and ample calories and protein[28].
- Eating a ***varied*** and **plant-rich** diet gives your immune system the **best support**.It is important to supplement **vitamin B12**, and depending on your degree of sun exposure you may need to supplement **vitamin D.**

How does diet influence the risk of COVID severity?

Animal products contain **pro-inflammatory products** such as advanced glycation end products (AGEs), haem iron, nitrosamines, heterocyclic amines, polycyclic aromatic hydrocarbons, saturated fats.

Chronic exposure to **pro-inflammatory products** is associated with **inflammatory health conditions** such as cardiovascular disease, atherosclerosis, type II diabetes, obesity, hypercholesterolaemia, autoimmune conditions and some cancers.

Ultra-processed foods, often high in sugar, unhealthy fats and salt, also cause inflammation. They have usually had healthy nutrients removed[29].

Plant-based foods reduce inflammation and cellular stress, support vascular health, whilst reducing the risk of chronic conditions[30].

- **Plant foods** ***support*** bacteria that **ferment fibre**, which leads to the ***generation*** of **short chain fatty acids** (SCFAs). SCFAs ***maintain integrity*** of the gut (reduce leaky gut), support almost all aspects of immunity, and reduce colonic pH.
- Contain **phytochemicals, vitamins** and **minerals** that are all ***active*** in **Immune function.**

Societal effects

Zoonoses: diseases have ***spread from animals to humans*** as long as humans have been in contact with domesticated animals, and COVID is likely the latest virus to spread in this way[31], just as **MERS, Ebola, HIV, the Spanish flu, swine flu, bird flu, smallpox, tuberculosis** and many others have spread in the past[32].

Intensive animal agriculture ***increases*** the spread of such diseases, through ***dense*** animal populations, where the animals are ***stressed*** and therefore ***immunosuppressed***, the widespread use of **antibiotics**, and spreading of **animal waste** into the environment[33].

- Meatpacking plants emerged as epicentres of COVID outbreaks. In the ***first 7 months*** of the pandemic, they accounted for over **300,000** cases and **18,000** deaths in the US, and a total economic cost in the region of **11 billion**[34].

- The prevalence of ***chronic lifestyle-related illness*** has added to the ***huge*** strain on health services, and the worldwide economy.

- **Vaccines** may be ***less effective*** in certain conditions: **obesity, hypertension** and **smoking** have been shown to ***lower antibody response*** to COVID vaccines[35].

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More information with references can be found on our website www.pbhp.uk here.

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