In cystic fibrosis a number of vitamins and minerals are important to help optimise health. These include calcium, iron and zinc as well as vitamins A, D, E and K.

**Calcium**

Calcium is essential to the body for maintaining strong and healthy bones. PWCF (people with cystic fibrosis) may have low bone mineral density (osteopenia or osteoporosis) due to some of the following factors:

- Chronic inflammation (due to the cycle of chest infections)
- Low body weight
- Not absorbing calcium properly in the bowel
- Poor dietary intake due to poor appetite

**Where do I get Calcium from?**

- The best sources of calcium are from dairy products e.g. milk, cheese, yoghurts, ice cream, rice pudding and custard.
- Some of these products have even more calcium added to them, e.g. Supermilk, Yoplait Cal-in+, Activia natural regular, “Glenisk organic yoghurt” or Alpro soya + calcium yoghurt.
- Low fat milk and milk products have the same amount of calcium as normal fat milk and milk products.
- If you don’t like these types of foods, non dairy calcium sources can be just as good: Orange juice with added calcium, fortified breakfast cereals, tinned salmon or sardines, baked beans and white bread.
- Generally non dairy foods contain less calcium and therefore will need to be eaten in larger amounts to make sure enough calcium is taken in.

- Getting enough vitamin D is essential to absorb calcium.
- Weight-bearing exercise (including walking and jogging) are very important for good bone health.
Iron

Iron is essential for blood production (and carrying oxygen in the blood) as well as many metabolic processes. PWCF may have low iron due to

- Chronic inflammation (due to the cycle of chest infections)
- Malabsorption in the gut
- Blood loss
- Poor dietary intake due to poor appetite.

Where do I get iron from?

- The best sources are meat and meat products, chicken, turkey and fish (including tinned fish) the yolk of the egg. This type of iron (haem iron) is most easily absorbed by the body.
- Other good sources include: dark green leafy vegetables (cabbage, spinach, and broccoli), pulses (peas, beans & lentils) and fortified breakfast cereals, cocoa, chocolate and dried fruit. These sources are not as easily absorbed by the body (non haem iron).
- Taking a food that is high in vitamin C (e.g. citrus fruits, strawberries, kiwis, tomatoes) with these iron rich foods helps improve the iron absorption.

Zinc

Zinc is essential for the healthy immune system, to make proteins and DNA, for wound healing and for a proper sense of taste and smell.

Where do I get zinc from?

- The best sources are oysters, red meat and meat products, chicken, crab, lobster. Fortified breakfast cereals, beans, nuts and whole grains also contain some zinc.
Vitamins

PWCF often need a higher intake of the vitamins A, D, E and K, probably due to malabsorption of these vitamins and/or higher requirements.

Vitamin A

Vitamin A helps to build normal tissues and cells in our body. It helps our immune system to work properly and is also very important to our eye sight, helping us see in dim light.

Where do I get vitamin A from?

Vitamin A is broken into two types; retinol and beta carotene.

- Retinol is found in foods such as liver, dairy products, oily fish such as salmon, mackerel or herring, eggs and some meats.
- Beta carotene is found in coloured fruit and vegetables especially carrots, red peppers, dark green leafy vegetables, tomatoes and yellow fruits including peaches, apricots and mangoes.

Vitamin A supplements should only be taken under the supervision of your CF doctor or dietitian, for some individuals too much vitamin A can be dangerous.

Vitamin D

Vitamin D is important for maintaining healthy strong bones and teeth. It helps calcium be absorbed from food into the body. Often PWCF don’t absorb enough vitamin D, this can have a long term effect on your bones, weakening them and possibly causing osteoporosis.

Where do I get vitamin D from?

Vitamin D can be gotten from food or the sun. In direct sunlight when our skin is exposed we can make vitamin D ourselves. However in Ireland getting enough sunlight throughout the whole year can be a challenge. Individuals with CF can have low sunlight exposure due to illness, being in hospital or recommendations to reduce
sunlight when using some antibiotics, for this reason extra food sources of vitamin D may be required.

- The richest food sources of vitamin D are oily fish (fresh or tinned), e.g. mackerel, herring, sardines, salmon, trout, cod liver oil and fish liver oils.
- Other sources include: eggs, dairy products and fortified foods e.g. margarines, milk and breakfast cereals.

In some cases PWCF may require extra vitamin D tablets. In CF, vitamin levels are measured at least every year, in some cases individuals may be recommended to take extra vitamin D tablets as decided by their CF care team.

**Vitamin E**

Vitamin E can help limit the effects of toxins, which can cause damage to your cells in the body. Low levels of vitamin E have been shown to affect brain function especially in young children.

**Where do I get vitamin E from?**

Vitamin E can be found in foods such as nuts, oils, spreads, olives and some breakfast cereals.

**Vitamin K**

Vitamin K is important for correct blood flow and blood clotting as well as bone health.

**Where do I get vitamin K from?**

Vitamin K is found in vegetables, especially greens such as cabbage and Brussels sprouts. It is also made within the body by good bacteria in the gut. In CF the use of antibiotics can reduce the number of good bacteria in the gut and thus the amount of vitamin K in the body.
A healthy diet alone is **not** enough to meet the vitamin and mineral needs for the majority of PWCF, therefore a CF-specific multi-vitamin and mineral preparation is **usually** needed. Please discuss with your dietitian or doctor.

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