

BIOFORTIFIED TOMATOES

TO COMBAT VITAMIN D DEFICIENCY



THE CHALLENGE

Vitamin D is a fat-soluble vitamin which protects bone health and is also important for immune function. Deficiency can cause rickets in children, bone pain and an elevated risk of cancer and dementia in adults. In the UK, almost 20% of children and one in six adults have vitamin D levels lower than government recommendations.

Vitamin D can be produced by the body when our skin is exposed to ultraviolet B (UVB) light from the sun. In the UK, 80 – 90% of our vitamin D can come from exposure to light with the remainder being derived from food. During the winter and particularly at higher latitudes the sun is not strong enough for vitamin D production and therefore supplementation is required to prevent deficiency.

The UK government recommends that everyone takes a daily 10µg vitamin D supplement between October and March. However, there is no mandatory food supplementation in the UK, as in other parts of the world such as the USA.

MORE THAN
20%
OF THE UK
POPULATION ARE
DEFICIENT IN
VITAMIN D

*How can the
biofortified
tomatoes help?*



OUR SCIENCE

Research by Professor Cathie Martin's group found an enzyme, which converts the vitamin D precursor, 7-dehydrocholesterol, (7-DHC), to other compounds.

By switching off the gene encoding this enzyme, using gene editing, researchers have been able to produce plants which accumulate 7-DHC. It has also been shown that exposing the leaves and fruit to UVB light for one hour, resulted in the conversion of 7-DHC to vitamin D3.

NEW PLANT BASED SOURCE OF VITAMIN D₃

Our research has identified a potential solution to vitamin D deficiency through biofortification of tomatoes to produce fruit containing high levels of vitamin D3 with the potential to be developed as a plant-based, sustainable source of the vitamin.

Tomato leaves, usually considered waste, also have the potential to be used as a source of vegan-friendly vitamin D3 for supplements.

- One ripe tomato fruit grown from gene edited plants produce 20% of the RDA of vitamin D, a similar amount to recommended food sources such as two medium sized eggs or 28g tuna.
- Leaves of edited plants contained up to 600 ug of provitamin D3 per gram of dry weight and could be used to produce a vegan-friendly source of vitamin D supplements, while reducing waste.
- A patent for methods has been filed and licenced.

SCAN FOR
MORE INFO



THE UK SPENDS
£100m
EACH YEAR
PRESCRIBING
VITAMIN D
SUPPLEMENTS

ONGOING RESEARCH

Working with collaborators at the UKRI-BBSRC funded Quadram Institute and the University of Surrey, we are now investigating whether consuming biofortified tomatoes, enriched in vitamin D, can supplement vitamin D levels in the UK population during the winter months.



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