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England approves first marketing notice for gene-edited Vitamin D tomato

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Gene-edited tomato accumulates high levels of pro-vitamin D3 and could offer a plant-based source of vitamin D as developers pursue FSA approval

England has approved the first marketing notice for a precision-bred tomato, taking the biofortified ‘Sunshine’ tomato developed at the John Innes Centre a step closer to commercialisation and marking a significant milestone for gene-edited crops in the country.

Developed in the laboratory of Professor Cathie Martin FRS, the tomato has been engineered to accumulate high levels of pro-vitamin D3 in its fruit and leaves. The development has also recently been evaluated in a landmark bioavailability study at the Quadram Institute, adding to the evidence base around its potential nutritional application.

Martin said the project reflects her interest in using plant science to address public-health challenges, particularly vitamin D deficiency. “With vitamin D deficiency a widespread problem, our biofortified tomato could one day be a low-cost, simple, plant-based solution that can improve diets across the world,” she said.

The marketing notice represents an important step towards bringing the tomato to market in England. It is also the first crop at the John Innes Centre to receive PBO marketing approval, making the development a milestone for the research institute’s precision-breeding programme.

The science behind the tomato builds on a natural pathway already present in tomatoes. Tomato plants produce pro-vitamin D3 as an intermediate compound before converting it into other substances used in plant defence. Using gene editing, Martin and her team modified the relevant genes so that the plants accumulate substantially higher levels of pro-vitamin D3 in their

fruit and leaves.

The compound can subsequently be converted into vitamin D3 through exposure to sunlight or UVB light. Vitamin D3 is the more stable form relevant to human nutrition. According to the researchers, the genetic changes do not alter the plant's appearance, growth characteristics or yield.

The nutritional potential is central to the tomato's commercial proposition. Each tomato could contain a quantity of vitamin D equivalent to that found in two eggs or 28 grams of tuna, based on the researchers' assessment.

The next stage will involve crossing the plants with sweeter-tasting and striped tomato varieties, with the resulting product intended to be marketed under the 'Sunshine' name, reflecting its enhanced vitamin D potential. The developers also plan to submit an application for approval to the UK Food Standards Agency.

The development comes as precision breeding moves from laboratory research towards regulatory and commercial applications in England. For the John Innes Centre, the Sunshine tomato provides a test case for how targeted genetic changes can be used to develop crops with specific nutritional traits while retaining conventional agronomic characteristics.