

Here's how the GMO purple tomato soon to be in US grocery stores came to fruition

Norfolk Healthy Produce's purple tomato first appeared in [The New York Times Magazine](#) eight months ago. Genetically engineered to naturally produce higher levels of healthy antioxidants, this purple tomato is supposed to make the longed-for world of garden-to-table quality and scrumptious taste available from the grocery shelf — offering individuals the choice of a healthier tomato by challenging trends of GMOs as flashpoints for health concerns, Big Ag, and risk offloaded to the consumer and benefit to recouped only the producer.

“Tomatoes are the second-most consumed vegetable in the United States, and while there are many options with types of tomatoes, there is huge consumer dissatisfaction with what you can actually find when shopping,” says Nathan Pumpin, President and CEO of Norfolk. “Everyone loves fresh heirloom tomatoes from their garden for a caprese salad or BLT, and that's what people want but can't find at the grocery store. And so we see a big opportunity to reach unmet needs of consumers through better tomato products as a starting point.”



Credit: Norfolk

But how and why a purple tomato, and what has transpired (no pun intended) since? The story starts in the United Kingdom with Professor Cathie Martin at the plant sciences-focused John Innes Centre. Her research was focused on how to make food healthier, more nutritious, and hopefully more attractive for people to want to eat — starting with a nature-based approach to engineer a high-antioxidant tomato. Incidentally, these key nutrients are pigmented purple and usually can make their way into the skin of a tomato based on traditional plant-breeding methods, but Martin's key breakthrough was to activate that pathway in the very fruit of a tomato by taking two genes discovered in the snapdragon flower. Once inserted, these two genes are activated during fruit ripening, when the tomato would usually turn red, and instead lead to the production of the same purple-pigmented antioxidants that are emblematic of blueberries, blackberries, and even eggplants. In 2008, Martin started Norfolk Plant Sciences to commercialize the technology she had developed — and in 2022, the US-based counterpart Norfolk Healthy Produce was founded to finally take the purple tomato the final steps closer to a market launch.

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Pumplin and Jessica Louie, Norfolk Healthy Produce's CTO, describe the purple tomato as a healthy, fresh, snacker tomato for the American market. In the months since the wave-making *New York Times Magazine* piece, the company has received (as of September 2022) approval from the USDA to grow and handle the purple tomato like a "normal tomato" — a major breakthrough for the company and the field of synthetic biology and agriculture, by their account — and they envision it to be initially priced comparably to premium cherry tomatoes.

Yet the fact that the purple tomato is the product of bioengineering and another example of genetically modified food means that its reception by consumers cannot be as simple as taste, nutrition, and pricing — even as Norfolk has received extensive early attention across environmentally and health-conscious consumers alike. "We're really excited by the individual person-to-person responses we've been experiencing when sharing purple tomatoes with them. We've received a lot of interest not only from liberal coastal early adopters but also from more of our agricultural centers not on the coast. And so to us, these groups of people who are fine with genetically engineered food and those who care about healthy eating have tons of overlap — it just hasn't been shown because there haven't been enough products on the market that demonstrate that, and this is one of the exciting pieces for our company to show," says Louie. In some ways, Norfolk recognizes that conversations around GMOs are not just about "science," but rather strike closer to the heart of deep questions about desired ways of life. "Our specialty is really in developing innovative new products in the produce space, and our hope is that these are the types of conversations and products that get people more excited about fresh, healthy food and change some of the purchase decisions and what's offered," adds Pumplin.

Reflecting on the long and complicated history of public trust, uptake, and desire for GMOs, Louie and Pumplin underscore Norfolk's commitment to reaching non-scientists and scientists alike to work on early adoption and greatest possible uptake while changing perceptions and conversations to focus more on the health potential and benefits of such food. "There's surveys mostly done by the Pew Research Center

that have been done asking the public, do you think that GMO foods are more or less healthy than conventional foods? It's about a 50-50 split, and really, especially the younger generations say that they don't care about whether it's biotechnology or not — they care about the product and how it was produced,” explains Pumplin. “Was it done equitably? Was it done locally? Is it going to be better for me? These are the questions that people care about, and nobody has really asked the question in a meaningful way of whether people would like to buy a better product that's enabled with biotechnology.”



Credit: Norfolk

While Norfolk looks ahead to the purple tomato reaching grocery shelves in 2023, it's a step forward that they feel perhaps could have materialized ten years ago in a different regulatory landscape. Pointing to the White House's recent Executive Order on the bioeconomy and an increasing emphasis on problems in areas such as the UN's Sustainable Development Goals as bellwethers of turning tide, Pumplin points to how existing regulatory guidelines “held back a lot of products like ours — it has made it almost impossible for small and medium-sized companies to compete and innovate in the space to develop and launch new products.”

The USDA updated their regulations in 2022 such that it became possible for a small company like Norfolk

to obtain regulatory approval for their purple tomato; meanwhile, approval processes at the FDA are also being reviewed “to try and improve those timelines and costs and especially the level of uncertainty,” Pumplin explains. “If that’s successful, then there will be a very clear, science-based regulatory process that does not favor large established incumbent companies. It will allow innovative, creative researchers like Cathie Martin to take groundbreaking discoveries, develop those into products, and get them out onto the market in front of consumers. And that’s what’s really needed.”

While Norfolk looks ahead in the long-term to everything from purple tomato juice to purple tomato salsa as future nutritious, processed products on a global market, they’re most excited about the purple tomato itself becoming available in due course. Pumplin’s closing pitch put it in the very farm-to-table spirit that the company is trying to espouse with their vividly colorful flagship product. “If there’s one takeaway we could leave you with,” he says, “we hope that once this product is available that people will be excited to try it and tell their friends and family about it!”

Thank you to [Aishani Aatresh](#) for additional research and reporting on this article.

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