Plantastic Discoveries

HOW PLANT BREEDING HAS MADE OUR CROPS SAFER TO EAT

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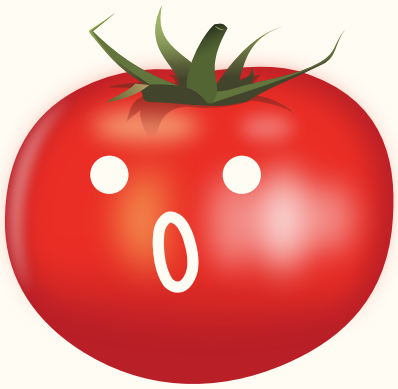
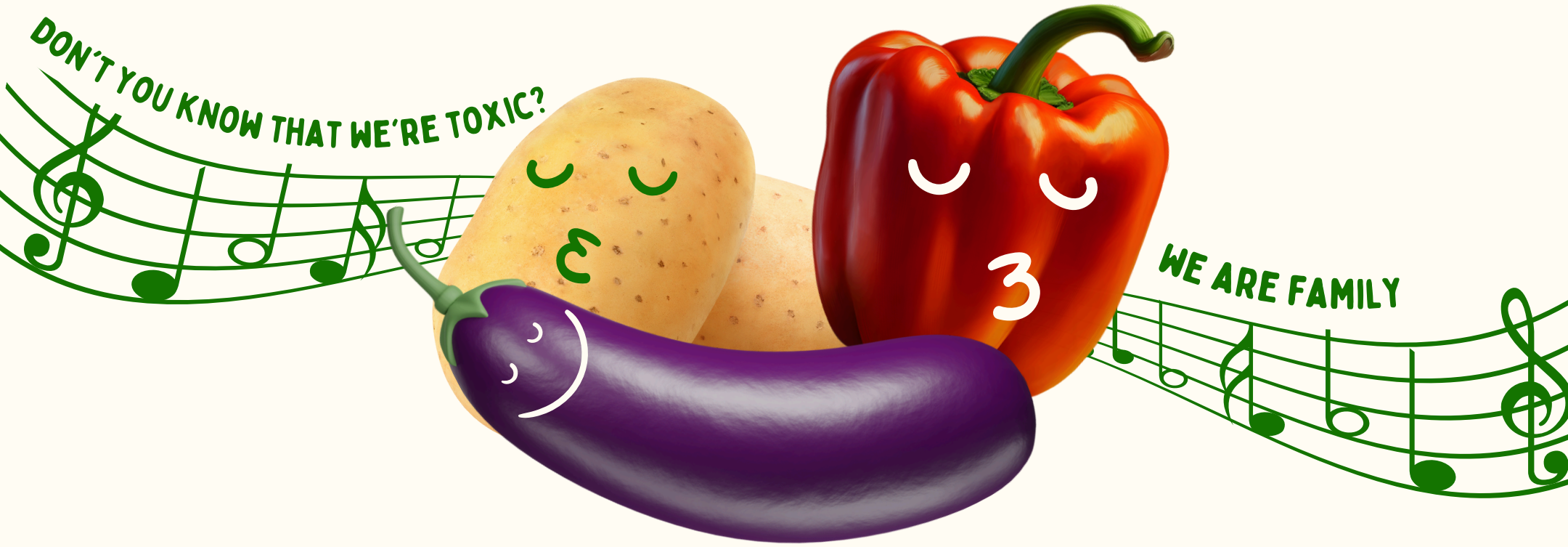
European Technology Platform

A BUNCH OF THE CROPS WE EAT TODAY, WERE ONCE PRETTY TOXIC!



Tomatoes, potatoes, eggplants and bell peppers, for example, are all part of the nightshade family, which typically contain natural toxics called **solanines** and **chaconine,** as well as **alkaloids.**



Although these toxics were typically found in low levels, they are more concentrated in some parts of the plant, like potato sprouts, bitter-tasting peels or green tomatoes.

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Did you know?...

Tomatoes made their way to Europe in the 16th century, and were mostly used as decorations rather than food because people thought they might be poisonous, due to their association with the nightshade family.

This fear persisted for over two hundred years. The fear was further exacerbated by the tomato's acidic juice interacting with the lead in common pewter plates at the time, which could have led to lead poisoning, but people attributed it to the tomato alone.

It wasn't until the mid-18th century that tomatoes became widely accepted as a food in Europe, and by the late 1800s, they were commonly consumed in various dishes.

PLANT BREEDING TO THE RESCUE...

Plant breeding has played a crucial role in transforming some crops into safer food sources by reducing toxic compounds. Hundreds of years of selection and cross breeding, has lead to the wide use and consumption of some crops that once were deemed as highly toxic!

Tomatoes, eggplants, potatoes and bell peppers, have been bred to have less solanines, chaconines and alkaloids.

Raw kidney beans contain a toxic compound called **phytohaemagglutinin**, which can cause severe gastrointestinal issues if not properly cooked. Plant breeders have worked to develop kidney bean varieties with reduced levels of this toxin, allowing them to be safely consumed after appropriate preparation, such as boiling or soaking.

AND PLANT BREEDING HAS ALSO HELPED REDUCE ANTINUTRIENTS IN CROPS!

Antinutrients are compounds found naturally in some crops that can interfere with the body's ability to absorb and use certain nutrients. Eating foods high in antinutrients can hinder the absorption of essential nutrients potentially leading to deficiencies, digestive issue and other health problems.

Rapeseed, for example, naturally contains antinutrients like **erucic acid** and **glucoinolates**, which are damaging to cardiac muscle and reduce the nutritional value of the plant. But through breeding efforts focused on reducing the level of antinutrients, rapeseed has been made a safe and nutritious crop!

Lentils have also been bred to have less antinutrients like **trypsin inhibitors**, **phytic acid**, and **tannins**, enhancing their nutritional quality and the ability of our body to absorbe them!

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AND HAS HELPED MADE MORE CONVENIENT CROPS... LIKE TEARLESS ONIONS!

Onions typically have enzymes that produce-eye irritating volatile compounds. By targeting the enzymes responsible for producing eye-irritating volatile compounds, plant breeders have selectively bred onions with reduced levels of these enzymes.

This concerted breeding effort has led to the development of a new strain of onions that either induce fewer tears or cause significantly less eye irritation when chopped.

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WHAT ABOUT ALLERGIES...?

While hypoallergenic crop varieties are not yet commercially available, plant breeding holds promise for addressing allergies in the future by potentially developing such varieties.

Conventional plant breeding, along with genetic techniques, can help make crops safer for people with allergies by modifying plant genes, and decreasing the proteins that cause allergic reactions. While completely removing allergens is hard, these methods offer hope for reducing allergen levels in crops, making food safer for everyone.

For example, research is already on the way trying to develop wheat varieties that people with celiac disease could eat - keeping the great backing properties of typical wheat!

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ASK US

🌱 Got questions about plant science & breeding? We've got answers!
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tinyurl.com/bdzhepr9

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