

## Science in Your Shopping Cart

### Episode 1: Tomatoes, Potatoes, and Spinach

#### Transcript

NARRATOR: What do the Roma tomato, red spinach and Huckleberry gold potato all have in common?

Guest: They're vegetables?

Guest: They're all round?

Guest: (laughing) I don't know.

NARRATOR: Don't know the answer? Well, listen further and find out.

NARRATOR: This is Science in Your Shopping Cart, and I'm Todd Silver

NARRATOR: Tomatoes, spinach, and potatoes. These three vegetables that have been part of the human diet for hundreds, if not, thousands, of years. Okay, so technically, tomatoes are fruits, but we treat them as very close cousins in the vegetable family.

These three vegetables, or two vegetables and a fruit if you will, they are loaded with healthy good stuff that make them tasty as well as great for our bodies. And they are versatile. The tomato alone has over 100 different varieties.

So, what do these three items have in common, the Roma tomato, the red spinach, and the huckleberry gold potato?

To find out, we'll have to travel to potato country Idaho and then to sunny California, but first, let's explore the origins of the Roma tomato, and head to Italy.

NARRATOR: Ah Rome, truly one of the great cities on earth. Rome is home to around 3 million residents, and millions more visit each year – walking their streets, churches, and amazing historical sites...from the Coliseum to the Spanish Steps.

Rome is also home to some of the most amazing food and wine in the world. So, it's no surprise that the hearty Roma tomato was invented in the Eternal City.

Wait, it says here the Roma tomato wasn't invented in Rome, it was developed in Beltsville, Maryland? Can this be right?

So you started in this building here?

AM: This is where I was, yes. Actually I started in building 2, then we went to building 50 (fade out)

NARRATOR: I visited Dr. Autar Matoo, a researcher in Beltsville's Sustainable Agricultural Systems Laboratory. He showed me one of their greenhouses where different varieties of tomatoes are developed.

NARRATOR: Okay so what are we looking at here?

AM: Here we have about 5 different ways of transforming tomatoes, and for different purposes--- actually, one is high yield, better nutrition, high lycopene in tomatoes, and also a couple of them for resistance to abiotic stresses.

NARRATOR: Dr. Matoo explained that the Roma tomato was developed here in Beltsville in 1955 by ARS scientist William Porte. The elongated Italian red tomato was bred from the San Marzano and Red Top varieties. The Roma was developed to be highly resistant to wilt, to be grown in a variety of climates, and with its heavy fleshy outer and inner walls give it protection against pests. Researchers later found out the Roma was also a reasonable source of lycopene.

NARRATOR: You mention lycopene and the advantage of a tomato that's rich in that source is..

AM: Anti-cancer, it's known that the lycopene is anticancerous; it's really good for health actually. It's a carotenoid, and there are different kinds of carotenoids such as beta-carotene but lycopene particularly is a special one that has been shown to be anti-cancerous.

NARRATOR: Today, ARS researchers are cultivating new varieties that have a brighter appearance, are tastier, more disease resistant, and are more suited to handle climate stressors.

AM: We are trying to figure out certain cultivars that we have developed resistance to drought and to heat and to cold. You see tomatoes cannot be kept at 4 degrees too long because they get destroyed. But we have some genes in these that allow them to stay at 4 for a little longer. If you want to, they have built a tolerance, these tomatoes. Same thing here we have done for the heat, (with) very high heat they get destroyed so in our case they recognize the heat, but there are genes they take care of it and this plant keeps going in the high heat. (fade out)

NARRATOR: The tomato research done here in Beltsville has attracted industry members such as Heinz Ketchup, as well as scientists from all over the world.

AM: A lot of people around the world have come here seeing this tomatoes for many years and that becomes a good thing because people want to see what we are doing at the USDA and this is really one of the productive pieces we have here, so people get excited, and also tomatoes are bred (fade out)

NARRATOR: Other previously bred tomatoes produced here in Beltsville can be found in ketchups, canned goods, and of course, in the produce section of your grocery market. They can also be grown just about anywhere, including in Rome. Now that's amore!

NARRATOR: Here's a riddle for ya, what's purple on the outside but gold on the inside? Los Angeles Lakers road jerseys? Barney the Dinosaur?

Try the huckleberry gold potato, which has a deep purple jacket but inside the flesh is golden.

Unlike the Roma tomato, the huckleberry gold potato was invented where you'd think, Idaho. That's where I traveled, by phone, to learn more about the origins of this unique potato.

JW: We're always looking for eye catching specialty varieties. Purple skin yellow flesh variety we thought would be very appealing to customers. So, a nice dark purple with a yellow inside, and one that will stay that way through cooking, really has we think a lot of appeal.

RN: It's a unique specialty because of its purple skin and yellow flesh, and it's also rated quite highly for very good culinary attributes.

NARRATOR: That's Drs. Jonathan Whitworth and Richard Novy, two researchers at ARS who developed this potato variety. They work at the Small Grains and Potato Germplasm Research Unit in Aberdeen, Idaho, and they're part of the Tristate potato breeding and variety development program, which comprises researchers in Idaho, Oregon, and Washington.

NARRATOR: They explained that the huckleberry gold has many attributes, including that it's packed with antioxidants. It also has a low starch content, which keeps the potato together when boiling, and gives it a more waxy texture.

JW: and that's a really good mouth feel for when you quarter something and season it and roast it in the oven. A little crisp on the outside but a nice waxy texture and mouth feel in it.

NARRATOR: The huckleberry gold potato is available in stores, and for growers it can be grown in a variety of climates across the United States.

RN: It's a very vigorous potato and I believe any home gardener if they're interested in growing it would have really good results from it. And also it bulks. And what I mean by that is the potato will get rather large under the vine rather quickly, so you can keep track as a home gardener as of at what stage you want to cut the vine back, let the potatoes cure underneath the ground and harvest them. If you want larger potatoes and a higher yield you would just leave them out in your garden longer. If you decide you want more small mini-potatoes then you would cut the vine back at an earlier stage.

NARRATOR: And where did the name come from?

RN: Well we have a lot of huckleberries in Idaho. If you come out to Idaho you'll see a lot of products made from Huckleberry. So that was sort of the origin.

NARRATOR: You're talking to someone whose never had a huckleberry.

JW: The huckleberry taste is really nice. It's about the size of between a wild blueberry and these great big blueberries that you see that are domesticated. And its got a nice, redish purple skin on it, and they're very delicious. And so they have a high value.

NARRATOR: OK, we're getting off track here. Back to potatoes. Huckleberry gold is just one of many potatoes developed here. Some of the names may not sound familiar to you, such as the Clearwater Russet. But if you've ever eaten at the golden arches, then you've likely had one of these varieties.

RN: In north America there only seven potato varieties that meet the stringent sensory specifications that McDonalds looks for. These varieties are called gold standard varieties. And with Clearwater becoming a gold standard variety in 2016. When you go to McDonalds or even other restaurant and have fries you're very likely that those fries will have come from Clearwater Russet.

NARRATOR: So, whether you're looking to sink your teeth into some crispy fries or roast a unique looking potato for a nice dinner, ARS has developed a potato for you.

NARRATOR: Spinach. The superhero of foods – boasting an impressive list of vitamins and minerals such as folate, beta-carotene, vitamin C, iron, calcium, and potassium. Spinach has been known to improve

eye health, lower oxidative stress, reduce blood pressure levels, and may even help prevent certain types of cancer.

NARRATOR: But the bitter, sometimes gritty, taste of some spinach varieties has turned off some shoppers. And the e-coli outbreak and subsequent massive recalls in 2006 caused consumers to shy away from this vitamin-packed superfood.

NARRATOR: Researchers at ARS's Crop Improvement and Protection Research Unit in Salinas, California, are banking on a bounce-back for the once-heralded spinach by introducing a new variety.

BM: This USDA red variety we just released is the worlds first true red spinach.

BM: Most spinach variety taste harsh taste, a little bit of bittery taste because of all of the oxalic acid it has. But this new red spinach variety that we developed has a little bit of sweet to the taste, so it tastes really great. I joke to people that maybe I should call have called it red delicious. It really tastes delicious.

NARRATOR: Dr. Beiqan Mou was the lead researcher in developing the world's first true red spinach variety in 2019, called USDA Red.

BM: The red color comes from betacyanin you like multiple plants have anthocyanin but a small number of plants like spinach have betacyanin that are more common than anthocyanin.

NARRATOR: Betacyanin and anthocyanin are both antioxidants, but Betacyanin is a more potent antioxidant. It's been shown to significantly reduce oxidative stress in patients and may even help in preventing chronic pathologies, inflammation, and cancer, according to the scientific literature.

NARRATOR: In addition to its power punch of health benefits, USDA Red is appealing to the eye, with its spade shaped leaves and blended shades of purple. It also has a moderate amount of sweetness, making it an attractive addition to specialty salads, center of plate items and mixes.

NARRATOR: Even though it was just recently released, growers, retailers, and researchers are already requesting seeds to grow the new USDA Red.

BM: Tremendous interest and demand for this red spinach produce. I've received emails and phone calls from all over the world.

BM: I hope the red spinach can bring some excitement and interest to the market and attract more consumers to eat more spinach. Spinach it's really loaded with nutrients. It's really a superfood.

NARRATOR: It may take 2-3 years for USDA red spinach to reach your grocery store or appear at your favorite restaurant, but once it arrives it may become your favorite green, or should I say, red-green.

NARRATOR: Bigger, stronger, faster, that may be ideal for cars or athletes, but when it comes to food, tastier, safer, and more reliable are the key traits to a winning variety. When ARS scientists create new varieties, such as the Roma tomato, huckleberry gold potato, or the red spinach, the goal is not just to add a new variety to the long line of fruits and vegetables, but make them tastier, make them more resistant to bugs and diseases so they have a long lifespan.

Be on the lookout for these varieties the next time you're at the grocery store, and decide for yourself.

NARRATOR: For Science in Your Shopping Cart, I'm Todd Silver, thanks for listening.

NARRATOR: Science in Your Shopping Cart is produced by the Office of Communications, Agricultural Research Agency at the U.S. Department of Agriculture. For more information, visit [www.ars.usda.gov](http://www.ars.usda.gov). Follow us on Twitter, LinkedIn, and Instagram, like us on Facebook, and watch us on YouTube.