# Researchers design folate-packed tomato

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Leafy greens and beans now aren't the only foods that pack a punch of folate, the vitamin essential for a healthy start to pregnancy. Researchers at the University of Florida's Institute of Food and Agricultural Sciences have developed a tomato with a full day's worth of the nutrient in a single serving.

"This is a technology that could potentially be beneficial worldwide," said Andrew Hanson, the plant biochemist who developed the tomato along with fellow folate expert Jesse Gregory, doctoral degree student Rocío Díaz de la Garza and with funding from the National Science Foundation. "Now that we've shown it works in tomatoes, we can work on applying it to cereals and crops for less developed countries where folate deficiencies are a very serious problem."

The researchers' work to develop the genetically engineered tomato was published online Monday by the *Proceedings of the National Academy of Sciences*.

Folate is one of the most vital nutrients for the human body's growth and development, which is why folate-rich diets are typically suggested for women who are planning a pregnancy or pregnant. Without it, cell division would not be possible because the nutrient plays an essential role in both the production of nucleotides — the building blocks of DNA — and many other essential metabolic processes.

Deficiencies of the nutrient have been linked to birth defects, slow growth rates and other developmental problems in children, as well as

health issues in adults, such as anemia.

The vitamin is commonly found in leafy green vegetables like spinach, but few people eat enough of this type of produce to get the suggested amount. So, in 1998, the Food and Drug Administration mandated that many grain products such as rice, flour and cornmeal be enriched with a synthetic form of folate known as folic acid.

However, folate deficiencies remain a problem in many underdeveloped countries where adding folic acid is impractical or simply too expensive.

“There are even folate deficiency issues in Europe, where addition of folic acid to foods has not been very widely practiced,” Gregory said. “Theoretically, you could bypass this whole problem by ensuring that the folate is already present in the food.”

So, will doctors be recommending a serving of tomato — one half of a cup — for would-be pregnant women anytime soon? Probably not, the researchers say.

“It can take years to get an engineered food plant approved by the FDA,” Hanson said. “But before that is even a question, there are many more studies to be done — including a better look at how the overall product is affected by this alteration.”

And there is another hurdle the researchers must clear. As the published paper notes, boosting the production of folate in the tomatoes involved increasing the level of naturally occurring molecules in the plant, known as pteridines. Little is known about these substances, which are found in all fruits and vegetables. Some vegetables contain many times more pteridines than the biofortified tomatoes. For example, the velvet bean — used in traditional Ayurvedic Indian medicine for centuries and found in some body-building supplements — contains 25 times the amount.

Source: University of Florida