Millions of consumers believe that organics are more nutritious than conventionally grown foods. But this defies basic plant physiology.

Plants are autotrophic, utilizing the basic elements of minerals, carbon dioxide, water, energized by sunlight through photosynthesis, to create the wide gamut of molecules they need to support their growth, including all vitamins. A crop's vitamin content is based upon the plant's genetics and the conditions it is grown in. If the growing conditions are the same, and soil composition equivalent, a tomato's nutrient content will be the same whether grown "organically" or conventionally.

Crop production specialists have several tools at their disposal to make sure that the soil is appropriately managed and the growing conditions are optimal. This management process includes soil testing and fertilization when necessary to ensure the soil has adequate minerals to grow a crop and obtain sufficient yields per acre and quality of produce. Farming operations routinely conduct a soil test to evaluate soil conditions and to amend whatever is needed. Additionally, they perform a plant tissue petiole test, which examines the plant's tissue to make sure the plant is healthy and taking up the appropriate nutrients from the soil. In the absence of adequate minerals, there would be very noticeable changes in both the plant and the produce's physical structure. As an example, below is an image of a tomato grown in calcium-deficient soil and cauliflower grown in boron deficient soil.
Appropriate mineral composition of the soil can be readily achieved; there is nothing magical about the organic methods. The tomato plant's root system will just as readily absorb and utilize synthetic minerals from fertilizers as it would minerals from manure or other forms of compost. An easily understood analogy would be an individual with iron deficiency anemia – a low red blood count because of iron deficiency in their diet. Does the treating physician prescribe large amounts of red meat, an organic source of iron, or a synthetic source of iron in the form of a supplement? Our small intestines will not differentiate between the two sources of iron. The absorptive surface area of the small intestine, as the absorptive surface area of the tomato's roots, will readily absorb either source because the structure of the needed molecule, in this case, iron, is the same. The tomato root system is looking for a specified structure, not its source.

This basic plant physiology is why all well-controlled studies, utilizing identical growing conditions, will never find any significant nutrient differences that would contribute to one's health between organics and conventionally grown crops. As an example, some organics may have slightly higher levels of various antioxidant phytochemicals. This results from the organic crops' higher stress levels during growth, initiating greater antioxidant protection from oxidizing molecules due to less crop protection methods used by conventional farming. However, does this slightly higher antioxidant level equate to better health for the consumer? For a brief review of this point, see the past article on this issue [2].

Let's say theoretically that an organically grown orange contained 10% more vitamin C than a conventionally grown one. A large orange contains roughly 97 mg of vitamin C, more than enough to maintain the maximum storage capacity of vitamin C of 1500 mg. Our theoretical organic orange would have 10% more than this, roughly 107mg. However, as pointed out here [3], vitamin C intake above 100mg would result in an enhanced secretion due to the body's inability to utilize it or store it. Even if, theoretically, the organic orange contained more vitamin C than the conventionally grown one, would it make any impact on your health? The obvious answer is no. It would be analogous to having a full fuel tank and then continuing to attempt to add more. More is not better; it's just more. Just as your vehicle normally runs on a quarter tank of fuel, your physiological needs for any nutrient are met from far below maximum storage levels. Maximum storage only reflects what the body can safely store and draw upon during periods of lower intakes, prior to the nutrient being excreted or potentially toxic. Maximum storage is not equivalent to maximum health.

"From a systematic review of the currently available published literature, evidence is lacking for nutrition-related health effects that result from the consumption of organically produced foodstuffs." American Journal of Clinical Nutrition [1]
The Danish Research Centre for Organic Farming funded a study to determine the nutritional value of organics versus conventional foods by the Department of Human Nutrition at the University of Copenhagen. The study's purpose was to determine if there were any differentiation between the resulting major and trace element content of the two cultivation methods. They studied five different crops, carrots, kale, mature peas, apples, and potatoes. All were cultivated organically and conventionally under the same conditions. As the study leader, Dr. Susanne Bugel, states, they were "No systematic differences between the crops." [2] The study did not support the belief that organically grown produce is nutritionally superior.
