

# The Postmodern Disconnect: Food Fetishism and Agricultural Reality

By ACSH Staff — April 8, 2003

There seems to be some disconnect from reality when one hears strident voices dogmatically proclaiming that our food system has "failed" and must be entirely transformed, or that the "Green Revolution" (which boosted crop yields through improved fertilizer use) is a failure. People who say that must think, as Tertullian (and later St. Augustine) would say, *Credo Quia Absurdum Est* "I believe it because it is absurd." That it is absurd can quickly be seen if one simply glances at the produce section of a modern supermarket and the cornucopia it offers to an increasing number of the world's population. It is absurd because though world population has doubled in the last forty years the absolute number of people in poverty and hunger has been falling steadily. Such absurd statements are made possibly because being absurd is the only way that some people can find to be different. One could legitimately argue that the number of those experiencing poverty and hunger is too large and should be declining faster, but to do so requires improving upon the agronomy that has taken us this far, not destroying it.

Absurdists tend to be oblivious to facts but some of their fellow travelers, at least, hunger for facts. The hardcore believers are probably beyond redemption, but they must traffic in back-up factoids to strengthen the resolve of the marginal believers. So, the obvious abundance and cheapness of food is countered by the assertion that it is less nutritious than "organic" food. Just add in a bit of spiritualism about immeasurable mystic potencies in "organic" food, and you can even get people to ignore or discount important evidence such as the nutrition-related increase in height and health of humans in developed countries and in a growing number of developing countries.

## **But What About the Planet?**

When the belief that "organic" food is in some inchoate manner better cannot be sustained, there is the ever-present claim that modern food production is bad for the environment. But to compare modern agriculture performance with that of some utopian past or some putative alternative, one ought to compare the environmental impacts in each case from output sufficient to feed the world's current population at the impressive per capita caloric intake that is now possible. By this reasonable criterion, the evidence is overwhelmingly in favor of modern agriculture. A brief review of this evidence is order. The peer-reviewed literature on these issues is clear and substantial:

1. Yield increases have meant that we are producing about 2.7 times as much food to feed a doubled population on virtually the same land area under cultivation as in 1960. For grains, the staple of the Green Revolution, it has meant a mere 4% increase in land under cultivation. Stated simply, 1960 yields would require virtually all of the land not yet being used for crops or taken out of cultivation for habitat and wildlife conservation to be cultivated.

2. Green Revolution crops are more efficient in using nitrogen, requiring less nitrogen input for each unit of output. As Norman Borlaug stated in his Nobel acceptance speech: "The old tall-stawed varieties would produce only ten kilos of additional grains for each kilogram of nitrogen applied, while the new varieties can produce twenty to twenty-five kilograms or more of additional grain per kilogram of nitrogen applied." Synthetic nitrogen fertilizer costs money, so farmers attempt to become more efficient in its use. The best measure of this is the ratio of nitrogen in the fertilizer applied to the nitrogen in the crop. This ratio fell for American farmers by 2% per year from 1986 to 1995. Another measure of increasing efficiency in nitrogen use is the feed-to-meat ratio. Waggoner and Ausubel (2002) report that the "calculated feed to produce a unit of meat fell at an annual rate of 0.9%" from 1967 to 1992 and that with increasing crop yields per acre, "cropland for grain-fed animals to produce meat for Americans shrank 2.2% annually."

3. Modern conservation tillage (or reduced, minimum, or no-tillage) agriculture using pesticides for weed and pest control conserves water, soil, and biodiversity better than its "organic" competitors and better than any previous forms of tillage (DeGregori 1985, 111-112). Conservation tillage is building up soil and soil quality. Planting with a drill preserves soil structure and vegetative cover (and the diversity of life therein) and preserves the earthworms and other lifeforms that are often destroyed by the deep plowing used in "organic" and older forms of conventional agriculture. These gentler modern practices have been expanded in recent years with crops genetically engineered for pest resistance or for herbicide tolerance, allowing forms of conservation tillage in which a less toxic, broad-spectrum pesticide is substituted for multiple sprayings of an array of targeted pesticides and herbicides, thereby reducing overall pesticide use. "Precision agriculture," using computers and GPS to monitor inputs and outputs over a farmer's entire cropland, creates still more efficiency, as does software advising farmers on the most efficient input use.

### **Where Will Get Water, Though?**

The environmental resource that is generally considered most threatened is water, and many worry about its sufficiency for sustaining a growing world population. Vandana Shiva has an unverified belief that "food crops for local needs" are "water prudent" (Shiva 2000). The claim is often made that modern agronomy has some "voracious" need for water, much as claims were made about the Green Revolution crops requiring huge amounts of synthetic fertilizer.

FAO (Food and Agriculture Organization of the United Nations) has just released a study that brings together the literature on water use in agriculture, once again challenging the absurdist claims of those opposed to modern agronomy (FAO 2003). Contrary to the claims of Shiva and others about the Green Revolution's voracious water use, in agriculture "water productivity increased by at least 100% between 1961 and 2001" (FAO 2003, 25). "The major factor behind this growth has been yield increase. For many crops, the yield increase has occurred without increased water consumption, and sometimes with even less water given the increase in the harvesting index" (FAO 2003, 25). For wheat and rice, two major crops of the Green Revolution, "water consumption experienced little if any variation during these years" as per capita water use in food production fell by half (FAO 2003, 25). FAO argues that genetically engineered crops can contribute to increased "water use efficiency" (2003, 28). A 100% growth in efficiency means that "water needs for food per capita halved between 1961 and 2001" (FAO 2003, 26).

FAO does not stop with merely reviewing past performance but lays out an agenda, including genetic engineering, for sustaining growth in output without destroying the environment. "Plant-level options rely mainly on germplasm improvements, e.g. improving seedling vigor, increasing rooting depth, increasing the harvest index (the marketable part of the plant as part of its total biomass), and enhancing photosynthetic efficiency...The modern rice varieties have about a threefold increase in water productivity compared with traditional varieties. Progress in extending these achievements to other crops has been considerable and will probably accelerate following identification of underlying genes" (FAO 2003, 27-28).

The FAO study brings together data from literature in journals on water use that many of us working on issues of agriculture do not always follow as closely as we should. The FAO study is a must read.

The question remains as to how our intrepid "organic" *aficionados* will respond to it. Undoubtedly they will ignore it until they can conjure yet another specious reason that all of modern agriculture is a failure. This does not mean that modern agriculture cannot be improved or that it does not merit constructive criticism all human endeavors warrant and benefit from criticism but as the FAO water study shows, the path to a sustainable future requires that we continue the research in science and technology that brought us this far. I believe it because it is *not* absurd. There is massive evidence supporting it.

## References:

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<http://www.fao.org/ag/AGL/aglw/aquastat/kyoto/index.stm> [1].

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