

Corn's best use

Corn Based Ethanol: A Win For Health and the Economy

By: Bill Holmberg ... as in the Physicians for Social Responsibility publication

Asthma, \$16 billion. Premature births, \$26 billion. All cancers, \$227 billion. Autism, \$126 billion. Heart disease, \$272 billion. Obesity, incl. Type 2 diabetes, \$190 billion. These are government estimates of the annual costs to society of some of the nation's leading health disorders. Mounting scientific evidence suggests that they share a common linkage: they can be triggered by ubiquitous, nano-sized, particle-borne carcinogens known as PAHs (polycyclic aromatic hydrocarbons), the primary urban source of which is gasoline aromatic compounds used to enhance octane ratings. PAHs are not only carcinogenic and mutagenic, they are genotoxic, and one of the most pervasive and persistent endocrine disruptor compounds found in the urban environment. Experts worry that as advanced direct-injected, high compression/turbocharged engines are used to meet new fuel efficiency and carbon rules, urban PAH emissions will likely increase unless fuel quality is improved. When the medical costs associated with the PAHs' carcinogenic/mutagenic emissions are considered, higher quality ethanol gasoline blends could save Americans tens of billions per year in reduced health and energy costs, while also substantially reducing the transportation sector's carbon footprint and dramatically improving our quality of life, especially for urban youth and those who live near congested roadways.

Since the elimination of lead in the 1980s, petroleum refiners have synthesized gasoline aromatics from crude oil via an energy-intensive process. Aromatic compounds are frequently the most expensive components in gasoline, and their costs go up as crude oil prices rise. One piece of good news: recent research by Ford Motor Co. and other experts has found that partially replacing carcinogenic aromatics with higher blends of ethanol (E-30, which is 30% ethanol mixed with 70% gasoline), could reduce particle-borne toxics and black carbon emissions by as much as 45% or more. Motorists would benefit from higher octane (94-plus, compared to 87 with today's 10% ethanol blends), better performance, and cleaner-burning fuels. This would also save money since ethanol is less expensive than aromatics from crude oil. Even more good news: Congress instructed EPA to reduce gasoline aromatic levels to the greatest degree possible in the 1990 Clean Air Act Amendments, so new legislation is not needed. EPA could act to improve gasoline quality standards in the upcoming Tier 3 rulemaking early next year.

Now for the bad news: the vast financial resources of entrenched international oil and related interests are being mobilized to prevent ethanol from building upon its already significant contribution to U.S. health, fuel supplies and the economy. Multi-million dollar media attacks have inaccurately, but often successfully, portrayed ethanol as a threat to food supplies and the environment. Nothing could be further from the truth. First of all, 98% of U.S. corn is not directly consumed by people, but instead used as livestock feed and for other purposes. The use of corn for ethanol leaves much of the corn's protein available to serve as feed. When the starch portion of an acre of corn is converted to ethanol, the feed grain that remains has as much protein and other equivalent high-value feed products as contained in an acre of soybeans. Since corn yields are nearly four times greater than soybean yields, the

economically and environmentally smart thing to do is to first process the corn to ethanol. Doing so results in the same amount of protein and feed co-product equivalents offered by an acre of soybeans, but with the additional multi-billion dollar per year bonus of the corn ethanol industry's job creation, health cost savings, oil import reduction, reduced gasoline prices, and environmental benefits.

Corn is categorized as a C4 plant, meaning it has a superior structure in utilizing carbon fixation through photosynthesis. This provides corn with the extraordinary ability to operate better than other categories of plants in conditions of drought, high temperatures, and nitrogen or CO2 limitation. Additionally, corn's genetic makeup allows it move more fertilizer nutrients, such as nitrogen and phosphorous, to its root zone where it is used for growth rather than polluting ground and surface water. **A multi-year USDA research project recently confirmed that no-till corn equaled switchgrass in SOC (soil organic carbon) formation, and that over half the increase in SOC was below one foot depth. The researchers estimated that deep soil SOC sequestration benefits of corn have been understated by 60 – 100% in modeling done to date.**

So-called “food vs. fuel” attacks have been conjured up by big oil as well as processed food producers and animal feeders who want subsidized U.S. corn to boost their profits. The ethanol industry eliminated the need for corn subsidies, thereby raising the market value and making corn-growing profitable throughout the world. This led to slightly higher corn production in 2012 than 2011, even with the impact of the drought in America.

Even Michael Pollan, an American author, journalist, activist, and professor of journalism at the UC Berkeley Graduate School of Journalism as well as a frequent critic of the current agricultural system, has effusive praise for corn's efficiency as a crop. “Few plants can manufacture quite as much organic matter (and calories) from the same quantities of sunlight and water and basic elements as corn.” Pollan goes on to praise corn's ability to extract carbon from the air in his book, *The Omnivore's Dilemma: A Natural History Of Four Meals*, when he states, “The C-4 trick represents an important economy for a plant, giving it an advantage...By recruiting extra atoms of carbon during each instance of photosynthesis, the corn plant is able to limit its loss of water and ‘fix’—that is take from the atmosphere and link in a useful molecule—significantly more carbon than other plants.”

Substituting ethanol—derived from one of nature's most efficient converters of sunlight and water, most efficient carbon-fixing plants, and a highly efficient source of protein—for carcinogenic, oil-derived, carbon-intensive and costly aromatic hydrocarbons offers society a rare win – win – win proposition.

The views expressed in these essays are those of their respective authors and do not necessarily reflect the views of Physicians for Social Responsibility.

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Lynn Ringenberg, MD said ..

diversion of food (corn) to fuel...who suffers? As stated in an excellent article in Sundays New York Times, Jan 6, 2013, that land once devoted to growing food for human consumption is now making lots

of money as fuel for cars, which most people in the poor countries where this is changing the local- & farmer landscape, like Asia, Africa and Latin America, don't even have cars. The article says " roughly

50% of Guatemalan children are chronically malnourished, 4th highest rate in the world, according to the United Nations. More corn from developed countries, like the U.S., is now going to make biofuel and not being exported for food to poor countries and what is exported is too expensive to buy. Is this ethically acceptable? NO, says the United Nations World Food Program head. Perhaps once the worlds poor & starving are fed and out of danger of dying from lack of food, then we should consider biofuel production as a win.