

AGRICULTURE, BIOTECHNOLOGY, BIOETHICS,
AND THE GLOBAL FDA - FOOD-DRUG & AGRICULTURE
COMPLEX

**POLJOPRIVREDA, BIOTEHNOLOGIJA, BIOETIKA
I GLOBALNA FDA-ZDRASTVENO SIGURNA HRANA
- POLJOPRIVREDNI KOMPLEKS**

Michael W. Fox

*“Who ever could make two ears of corn or two blades of grass
to grow up on a spot of ground where only one grew before
would deserve better of mankind and do more essential service
to his country than the whole race of politicians put together.”*

Jonathan Swift (1667.-1745.)

*“The significant problems of the world cannot be solved at the
same level of consciousness at which they were created.”*

Albert Einstein (1879.-1955.)

ABSTRACT

Food safety, quality and security are rising concerns both nationally and internationally. The hegemony of multinational agribusiness corporations promoting non-sustainable agricultural practices erodes both cultural and biological diversity; promotes cruel and environmentally damaging concentrated animal feeding operations (CAFOs or factory farms) supported by wholesale use of antibiotics, anabolic steroids, live vaccines, pesticides, and other veterinary drugs; and the planting of patented, genetically engineered/modified (GM) and hybrid crop varieties coupled with toxic agrichemical pesticides and fertilizers.

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The validity of these concerns will be documented from a holistic veterinary, public and environmental health perspective. The bioethical basis for the adoption of bioregionally appropriate, sustainable, traditional, innovative, community supported and supporting, humane, socially just, and organically certified farming practices and marketing cooperatives will be detailed. In the face of climate change, rising oil and food prices, dwindling food reserves, and increasing world hunger, finding and applying alternatives to conventional, petrochemical-based agribusiness is one of humanity's most urgent priorities.

Key words: bioethics, holistic approach, sustainable farming, food and environment safety

SAŽETAK

Kvaliteta i zdravstvena sigurnost hrane zabrinjava Svijet. Hegemonija multinacionalnih korporacija, koje neodrživom poljoprivrednom tehnologijom oštećuju kulturnu i biološku različitost; promiču okrutnu i za okoliš pogubnu hranidbu stoke (industrijske farme) uz podršku masovne uporabe antibiotika, anaboličnih stereoida, živih cjepiva, pesticide i drugih veterinarskih preparata; siju patentom zaštićene genetički modificirane (GM) i hibridne sorte uz primjenu toksičnih agrokemijskih pesticida i mineralnih hraniva.

Opravdanost ove zabrinutosti biti će sagledana iz perspektive cjelovitog pristupa veterini i zdravlju okoliša. Bioetička osnova za primjenu odgovarajuće bioregionalne, održive, tradicionalne, inovativne, humane, društveno pravedne i od društva podržane, ekološki certificirane poljoprivredne prakse i tržišne zajednice biti će pojašnjena. U vrijeme klimatskih promjena, rasta cijena goriva i hrane, nestanka rezervi hrane i porasta gladi u Svijetu, najhitnije je potrebno pronaći i primijeniti alternative konvencionalnoj, na petrokemiji temeljenoj poljoprivredi.

Ključne riječi: bioetika, cjelovit pristup, održiva poljoprivreda, sigurnost hrane i okoliša

THE TRANSNATIONAL FDA

The late President of the United States, Dwight Eisenhower cautioned, ‘Beware of the industrial-military complex.’ In today’s global context, the transnational FDA, (food, drug and agribusiness) industrial complex needs to be confronted and dismantled.

Poverty and hunger are exacerbated by the disenfranchisement of indigenous farmers and once sustainable communities by commodity crop developments and subsidized imports, including crops grown to feed livestock and poultry for the more affluent urban consumers. Landless ‘peasants’ become the urban poor, their indigenous wisdom, sustainable farming systems, and crop and livestock varieties being lost in the process. The harmful socioeconomic consequences of CAFOs (concentrated animal feeding operations, i.e. ‘factory farms’) in the US have been well documented. Once independent family farms have become extinct, either forced into bankruptcy or contracted into corporate serfdom by large, and increasingly transnational agribusiness conglomerates.

The global imperialism of such monopolists is assured when tax payer’s moneys go to heavily subsidize commodity crops and animal feedstuffs. These farm subsidies help this agribusiness sector gain an advantage in the competitive world market place, but much to the detriment of America’s once vibrant and productive nexus of family farms and rural communities, now decimated by this juggernaut of economism that is called progress and necessity. Trade agreements through NAFTA and the WTO, (the North American Free Trade Association and the World Trade Organization), with their transnational laws and regulations set up to facilitate the fixing of prices, supply, and demand, violate the sovereignty of nation states and the viability of farming communities world-wide.

CONDITIONED CHEMICAL & DRUG ADDICTIONS

We are all conditioned as children to take our medicine, and as adults to trust the good doctor and not question Aesculapian authority. In science we all trust. Anything that is called ‘scientific’ or ‘science-based’ is acceptable. But Aesculapian authority needs to be questioned, and the pharmaceutical industry held accountable for violating public trust with its rush to fast-track new drugs

and vaccines for government approval, patent protection and world-market profits. Agribusiness' petrochemical industry claims scientific authority over the 'safe and effective' application of pesticides---agricidal poisons--- to the land as well as to the food-chains of man and beast. This same industry lobbies against any restrictions on the use of antibiotics in livestock feed, and other food-animal veterinary biologics/drugs that substitute for more humane, disease-preventing methods of livestock and poultry production; putting both humans and animals at risk in the process.

The food and drug industry complex with its pharmaceutical and petrochemical and 'life science' agribiotechnology components is not to be trusted. The public trust has been violated in countless ways in the rush for corporate profits and market monopolies. How can we trust the medical profession that condones the wholesale medication of even kindergarten children, with psychotropic, mood and behavior-altering pharmaceuticals? Or organized veterinary medicine that never opposed the use of antibiotics as feed-additive growth-stimulants for poultry and livestock? Neither the American Medical nor Veterinary Medical Associations opposed government approval BGH---genetically engineered bovine growth hormone, ---the first product of animal production biotechnology to be rushed to market, before the rash of genetically modified live virus vaccines. (BGH is prohibited in Canada and the UK for cow heath and public heath reasons). Who can trust the food industry when it is public knowledge that the 'life science' biotechnology industry-government alliance allowed the planting and consumption of never-tested or authorized, yet patented (even by the US government) varieties of genetically engineered food and feed crops? (See Addendum for documented concerns). The enduring government alliance with the petrochemical pesticide and fertilizer companies that continue to poison our food and water, and contaminate our oceans and amniotic fluids, along with all the drugs consumed that we and livestock excrete, is a matter of fact.

Profits and pestilence aside, the veterinary and human medical advocates of conventional vaccines and drugs for a sickening society and sickly, stressed factory farmed livestock and poultry, can no longer ignore the price of success: Nor can the agribusiness food industry, squandering land, water and oil/fossil fuels to boost production and profits with its toxic petrochemical fertilizers and pesticides.

DRUGS AND FARM ANIMAL HEALTH

CAFOs (concentrated animal feeding operations, or ‘factory’ farms) are a bad investment in the long-term. Notably, they are pathogenic, spreading agrilogenic and domestogenic diseases---new crop and animal pathogens and the chronic human diseases associated with the Western diet. They are also a major source of diseases of food-born origin, often epidemic in scale, and other diseases like Avian and Swine ‘flu. New zoonotic diseases, and more virulent strains of existing zoonotic pathogens, are likely to evolve because of the pathogenic environments and condition of the animals incarcerated in CAFOs.

Like agrichemicals, not all vaccines are bad. But like many drugs they stimulate populations of pathogens and harmless organisms to mutate and become more harmful. So we need new, more costly---and highly profitable---mutation and serovar-specific vaccines and ever stronger antibiotics and other drugs. The same is true with the application of agricultural, food industry pesticides, a global industry, along with genetically engineered crops, that stimulate populations of resistant weeds, insect pests, and crop diseases. And both human and veterinary drugs and agrichemicals cause serious water contamination.

Human and veterinary vaccines and drugs give us a false sense of security and put us on the treadmill of addiction/dependency to prevent and treat diseases in essentially pathogenic environments, notably those where there is human over-crowding, poverty and malnutrition, and where virtually genetically homozygous farmed animals are crowded together in CAFOs, mirroring the genetic uniformity of commodity crops grown in disease-promoting monocultures.

Ideal substrates/environments for the proliferation of pathogens have been created in CAFOs with the commercial hybrid livestock and poultry lines being virtually homozygous---and now even being cloned---. This calls for more drugs and vaccines, -what I call domestogenic diseases of animal production--- that mirror the agrilogenic pest and blight problems of crops that are also raised in homozygotic monocultures on nutrient-and micro-organism deficient, agrichemically intoxicated soils.

Factory farmed animals are made genetically as uniform as possible in terms of growth rates/productivity, in order to maximize profits. The more so

when they have been cloned, a biogenetic engineering process now in full swing. Genetically similar lines of pigs for example, make similar weight gains and reach slaughter weight at the same time. This uniformity mirrors that of commodity food and feed crops grown in monocultures. Both provide ideal substrates/environments for the proliferation and evolution of increasingly virulent and highly infectious and contagious organisms. Coupled with husbandry factors such as over-crowding stress, soil nutrient deficiencies etc; this lack of genetic diversity increases the virulence of organisms, even making harmless ones, (so called commensals and symbiotes) into pathogens and pests. Those pathogens that can rapidly mutate or acquire genetic material from other organisms can soon develop resistance to antibiotics, pesticides, and other drugs, in some instances even thriving on them.

Deliberately infecting already immuno-compromised animals in CAFOs with modified /attenuated, yet still live viral vaccines is problematic and counter-intuitive considering the zoonotic, public health risks, manufacturers' profits notwithstanding. The various antibiotics, antihelminthics, and other veterinary drug residues, including anabolic steroids and growth hormone implants, and feed additives and contaminants like copper, arsenic, cadmium, lead and dioxin that go into the environment in animals' nitrogenous and phosphate-loaded excrement, pose a challenging management and containment problem, (especially to surface and ground water) that few if any CAFOs effectively address.

Recycling slaughtered livestock and poultry remains, and food and beverage industry by-products, into livestock and poultry feeds that are not organically certified and therefore can contain pesticide residues, dioxins and heavy metals, and various pathogens, compromise animal health and welfare. Manufactured livestock and poultry diets can be deficient in essential nutrients, and being formulated to increase growth/productivity at the lowest possible ingredient cost to maximize profits, can result in production-related diseases, notably metabolic and liver diseases in cattle, arthritis/lameness in pigs, and lameness, obesity and heart attacks in broiler chickens. . Feeding livestock and poultry GM herbicide and insect resistant crops and byproducts containing endogenous toxins like Bt, and absorbed herbicides, and conventional feed from nutrient deficient soils and hybrid 'Green Revolution' crop varieties, pose further animal and consumer health issues.

One of the most limiting factors in establishing CAFOs is the diminishing supply of water world-wide, and the vast quantities demanded by such operations. The amount of land and resources used to raise feed and fodder for intensively raised, confined livestock and poultry has a major impact on biodiversity. The negative impact on wildlife habitat is compounded by the adverse wildlife and habitat impacts of extensive livestock husbandry systems of grazing/ ranching/ pastoralism where there is over-stocking/over-grazing, and indiscriminate predator control. The adoption of sustainable livestock production systems linked with organic food, feed and fodder production appropriate to the natural resource availability in given bioregions would do much to help advance the conservation-based agriculture approach to wildlife protection and habitat restoration.

POPULATION AND CONSUMPTION ISSUES

The price of success in maintaining and promoting human population growth with decreased mortality rates and arguably longer life expectancies means more hungry mouths to feed and potential disease outbreaks to fend off. In more affluent and consumptive socioeconomic sectors around the world the diseases of affluence like obesity-diabetes/metabolic syndrome, and cancer, are part of the price of success. But the ever more impoverished and landless survivors of averted epidemics and famines, and the more affluent but disenchanting, together make the kindling of inter-tribal conflicts, war and acts of terrorism inevitable.

Uncoupled from any family planning and concerted population control, effective resource management and conservation, pollution control, sustainable agricultural practices and economies local and global, poverty, sickness and famine will be the legacy of the human condition, passed on with increasing virulence from one generation to the next. Look at our history since the beginning of the Industrial Revolution, the Age of Reason, and the epoch of colonial imperialism, once nationalistic, now corporate and transnational. The fear-based progress and the success of the modern age envisioned by the military-industrial technocracy generations ago, to essentially find ways to profit in the name of fighting famine and pestilence, two of our primal fears, by selling more drugs to save more people---for what? And by selling more toxic chemicals to produce more food—for why, but mainly to fatten the cattle of the

rich as Gandhi observed, now mean that there are ever more moths to feed and souls to suffer.

The price of success in maintaining unhealthy concentrations of animals for human consumption and for other commercial purposes, made possible by the use of veterinary vaccines, antibiotics and other drugs, has meant more resistant and harmful pathogens, more and more being harmful to humans, the so called zoonotic diseases. When computed along with the environmental impact of extensive livestock herding and grazing, CAFOs are the number one contributor to climate change; and a leader of the pack in ground and surface water pollution and topsoil waste. Corporate profits notwithstanding, the misguided altruism of philanthropic agencies and individuals playing into the FDA system, giving \$ billions in drugs, food aid, and seed and livestock varieties unsuited for sustainable farming, is a major impediment to real progress in the human condition that is inseparable from environmental health and quality, and from the protection and restoration of both cultural and biological diversity.

WESTERN DIET AND HEALTH

It is argued that without the use of the petrochemical industry's fuel, pesticides and fertilizers, and the genetically engineered commodity crops of its agribiotechnology affiliates, commercial, high-volume crops like cotton, corn and soy could never be produced in the amount that is needed to clothe and to feed people ever more beef and cheese, rather than whole wheat and organic rye, and more pork and chicken rather than lentils and beans. The Western economy, and the middle class in particular that has been raised on this diet (of the affluent), rather than on the healthier, high cereal/grain, legume, fruit and vegetable-based diets of the materially poorer indigenous peoples around much of the world, are being crushed by the rising drug and health care costs, primarily arising from a meat and processed 'junk' food-based diet. While informed Westerners adopt some of the more healthful diets of indigenous peoples, their own governments, and donor, 'philanthropic' agencies, like the UN's World Bank, are working to implant their own industrial agriculture and the Western diet in developing countries to sate the rising demands of the affluent, and the tourist industry, for beef, chicken, cheese, ice cream, and in non-Muslim countries, more pork instead of lentils, chick peas and beans.

The irony that the Western diet is now being associated with not only such epidemic problems as obesity, stroke, heart attack, diabetes and chronic degenerative diseases like arthritis as well as a range of cancers and birth defects and brain damage, but also with behavioral changes in the consumer populace. Most notable is the epidemic incidence of anxiety and obsessive compulsive, addictive, and depressive disorders, and various psychoses, violent and delusional. These behavioral abnormalities are associated with disrupted brain, neuroendocrine system chemistry, like the neurochemicals serotonin and nor-adrenaline. While social and emotional stress contribute to these complex and widespread mental health problems, radical dietary changes that are the antithesis of the Western diet and that embrace some of the nutritional wisdom of earlier times and indigenous traditions, have been shown to greatly help many of these neurobehavioral, psychological, and psychosomatic disorders, especially in children.

We may never know to what degree we have harmed ourselves, even for ever, genetically, with petrochemical pesticides that are lipophilic, being selectively absorbed by fatty tissues, as in the skin of oranges, the breasts of women, and the brains of all. More and more people, along with their pets, make dramatic recoveries from a variety of health problems following a change in diet that includes the exclusion of almost all the conventional human and companion animal (cat and dog) prepared and processed foods.

That highly refined, denatured, and bleached wheat flour was sold as ‘Wonder Bread’ for decades in the US, while the more nutritious ingredients were either put into livestock feed, or used by other food industry sectors, including the ‘health food’ industry that sold at premium prices the bran, gluten and vitamins that was taken out of Wonder Bread, as essential dietary supplements. Wonder Bread is the Asian and Middle and Far Eastern equivalent of polished white rice, the essentially denatured, nutritionally deficient staple food of billions of uninformed people.

Much of the food we consume today and that goes in to pet foods and livestock feed are from ‘high performance’ patented hybrid seed varieties that were developed in the 1960’s and ‘70’s as part of the much hyped ‘Green Revolution’ to feed the hungry world and end famine and malnutrition around the globe.

‘GREEN REVOLUTION’ HARMS AND COSTS

In the 1990 declaration by the International Movement for Ecological Agriculture meeting in Penang, Malaysia, the following critical comments were made on the Green Revolution:

‘Modern intensive agriculture has conspicuously failed to increase food production and to meet global food and nutrition needs. The claim that the Green Revolution has led to higher crop yields is highly exaggerated and does not reflect a fair and complex comparison with more ecologically sound systems:

These claims are usually based on the measurement of yield as defined per acre or hectare of land. However, if one takes into account the hidden costs on input subsidies and nonrenewable resources, and the costs of ecological damage (leading to lower yields after some time) and furthermore, measure yield against high fertilizer and water costs, then the Green Revolution techniques are highly inefficient. In contrast, the economic soundness is striking of traditional and ecologically better varieties.

Even more seriously, the Green Revolution measurement of output is flawed because it only accounts for a single crop (e.g., rice) and even then only a single component of that crop (e.g., grain) whilst neglecting the uses of straw for fodder and fertilizer. Thus, it neglects to take into account that there were many other biological resources (e.g., other crops, other no-grain uses of the measured crop and fish) within the same land in the traditional system that were reduced or wiped out with the Green Revolution. If output is measured in terms of total biomass, a more realistic picture of the performance of the Green Revolution will emerge.

Although yields of food crops in total have increased, less food is available to local populations. There are several reasons for this:

- There has been an increase in a few cereals (a large volume of which is fed to cattle in the North) at the expense of pulses and other crops;
- The increased dependency of Third World farmers and countries on intensive inputs has led to indebtedness and the breakdown of self-sufficiency;
- Much of the increased food production is exported, thus denying the food to local people;

Many areas planted with high-yielding varieties (which are actually high-response varieties to the applied inputs, including chemical fertilizers and pesticides) are now experiencing diminishing returns; Ecological degradation is leading to reduced yields and to the abandonment of many areas of agricultural land; Losses during storage have increased markedly in many areas; The low prices paid for farm produce and the high prices charged for food in the shops, combined with increased levels of indebtedness, ensure that many farmers cannot afford to buy sufficient food for their families.'

(End of Declaration)

The failure of the Green Revolution was underscored in a report from the UK's Global Environmental Change Programme, funded by Britain's Economic and Research Council, and published in April 2000. Green Revolution crops, introduced in the late 1960's and early 1970's increased agricultural output and profits, and provided much needed and affordable calories for the poor. But these crops failed to take up minerals such as iron and zinc from the soil. The report states: "High yielding Green Revolution crops were introduced in poor countries to overcome famine. But these are now blamed for causing intellectual deficits, because they do not take up essential micronutrients." Iron deficiency disease contributes to increased infant mortality, impaired brain development and learning ability, affecting an estimated 1.5 billion people in one quarter of the earth's population, according to the author of this report, Dr. Christopher Williams.

It should also be added that micronutrient deficiencies, also a nutritional problem in the West from deficient soils and crops, can impair the immune system, and related nutritional deficiencies and imbalances in various animal products, especially in the omega 3 and 6 polyunsaturated fatty acid ratios can impair brain development and cognitive functions.

Recent studies in Canada, the U. S. and the U. K. have shown that fruits and vegetables are less nutritious than 30-50 years ago, showing often marked deficiencies in iron, copper, zinc, calcium, sodium, phosphorus, protein, vitamins C and riboflavin, a disturbing finding attributable, in part, to the fast-growing and large-yielding varieties of crops being grown today for human consumption: And to the use of chemical fertilizers, potassium fertilizer, for

example, interferes with plants' magnesium and phosphate absorption. Herbicides like Monsanto's Roundup can interfere with plants' uptake of iron and manganese. Widely used nitrogenous fertilizers can increase harmful nitrate levels in conventionally grown crops, lower the plant's vitamin C content, and while increasing total protein content, the quality of the protein is inferior to organically grown crops, lacking in essential amino acids like lysine, which means lower quality food, and livestock feed.

ORGANIC IS SUPERIOR

Studies comparing the nutrient content of organic versus conventionally grown crops report significantly lower levels of potentially toxic aluminium, mercury and lead in the organically grown, that also had higher levels of many essential trace minerals and other nutrients, notably boron, calcium, chromium, copper, iodine, iron, lithium, magnesium, manganese, molybdenum, phosphorus, potassium, selenium, silicon, sodium, sulfur, vanadium, and zinc. Also more vitamin C, bioflavonoids and other antioxidants, and less nitrate. Produce from animals fed organically grown feed are more nutritious than from CAFO raised animals fed manufactured food-and beverage industry byproducts and synthetic supplements and drugs. Organic beef has more healthful Omega 3 fatty acid content; organic chicken has more Vitamin E, Omega 3 and beta carotene, as has organic milk, that has also more antioxidants, lutein and zeaxanthine.

Animal studies have shown that such functions as reproduction and resistance to infection may be adversely affected by conventionally produced foods as compared to organically produced ones.

Studies around the world of organic farming methods found that they contributed more to biodiversity and wildlife conservation than do more harmful conventional farming practices. Organic agriculture increases biodiversity at every level of the food chain, from soil bacteria to wild mammals and raptors.

University of Michigan professors Catherine Badgley and Ivette Perfecto have completed a three-year study of worldwide organic vs. conventional farm yields and found that organic farming could produce three times as much as

low-intensive methods on the same farms in developing countries, and to produce almost equal yields to conventional farms in developed countries.

Like holistic medicine, organic farming is systemically integrated within the physical parameters of general systems theory and quantum mechanics as they relate to dynamic living ecosystems, with the overlays of ethics, esthetics, and metaphysics. As 2008 President of the Pennsylvania Sustainable Agriculture Association's annual conference, dairy farmer Kim Seeley advised in his opening address, that we must all "Obey Nature's laws first before we accept man's laws."

That more holistically-oriented physicians, veterinarians, and agronomists are at last beginning to put such wisdom in to practice is a clear sign that a paradigm shift or change in our worldview is taking place and that the status-quo of conventional medicine, agriculture, the economy, and other social institutions is no longer acceptable and most certainly not viable without further violence and suffering. As more medical and veterinary scientists are becoming real healers, so more farmers are becoming real land-stewards. Their paradigm is based upon the following bioethical principles: compassion, service, humility, ahimsa (avoiding causing harm), and reverential respect for all life; social justice; eco-justice, and the precautionary principle. These are the cornerstones of a healthy community and of a sustainable economy. We have all but eliminated the Meadow lark from our fields. We have many wrongs to right, and much to atone for what our ancestors and civilization have done to harm through fear and ignorance, arrogance and greed.

Advances in the science and bioethics of alternative human and veterinary medicine and organic agriculture that are based on this new paradigm hold much promise and should be supported by the corporate sector as well as by the consumer-populace and governments around the world.

BEWARE OF THE FDA'S 'LIFE SCIENCE'

Industrial agribusiness' indifference and corpus of denial of toward the suffering of intensively raised farm animals parallels the indifference toward all the harmful agrichemical pesticides and fertilizers that are now in our rain, food,

drinking water, mothers' milk, and even amniotic fluids, and that have turned the countryside into a toxic chemical wasteland.

The infamy and hegemony of the multinational, oligopolistic corporations like Monsanto, Novartis, and Syngenta, that have named their business the 'Life Science' industry, pushing these agricultural inputs from seed and equipment to chemical fertilizers and pesticides onto developing countries, after decimating the once sustainable network of small farming and food processing operations in the Americas and Europe, and much of the rest of the industrial, 'developed' world, are a matter of public and historic record. This multinational industry essentially 'out-sources' agricultural production of commodity crops that it imports to the U.S. on the cheap from countries where poverty and corruption often rampant, and where agricultural chemicals banned in the U.S. are widely used.

A major, global venture of this Life Science industry has been to develop varieties of high-yield hybrid seeds, and more recently, genetically engineered seeds that are resistant to herbicides, produce their own pesticides, nutrient supplements for livestock, (like lysine that factory farmed pigs need a lot of), and even pharmaceutical drugs, created not to feed the hungry world, but for patent-protected, new and profitable commodities. During the 1980's these monopoly players---the petrochemical, pharmaceutical and life science conglomerates---rushed to buy up all independent seed companies and their seed stocks. Patented, high yield hybrid varieties are few in number, widely planted, and genetically uniform. The uniformity means genetic vulnerability to disease (same for the patented hybrid strains of commercially farmed animals). It is these highly inbred, hybrid varieties that are now being genetically engineered, and spreading world wide at the ever quickening pace of global monopoly.

The seed stocks of conventional and heirloom varieties are not being planted, are deteriorating in storage, and when planted are likely to be come contaminated by the pollen of genetically engineered crops from neighboring fields and counties. This accelerating decline in the genetic diversity of our major food, feed and fiber (and biomass and green manure) crops, coupled with the genetic disruption of plant genomes that the genetic engineering process can cause (see below) call for a total moratorium on any further plantings of GM seeds. As referenced below, there are enough documented research studies to

negate the government-industry response to such a moratorium and community-linked GM-FREE Zones that would say that there is no scientific evidence of harm to animals or to human consumers, and that GM seeds are ‘substantially equivalent’ to conventional varieties.

The socially and politically disruptive and devastating human suffering soon to come, according to some agronomists, including Nobel laureate Norman Borlaug (whose crop ‘improvement’ genetic research has arguably caused more harm than good in the hands of agribusiness oligopolies) is from the Ug99 strain of black stem rust fungus on the world’s wheat crop. This world wheat crop has so little genetic diversity now that there are few varieties and cultivars with any genetic resistance to this devastating disease that could mean global famine. Putting all our eggs in the same basket is never a wise investment.

This Life Science industry has convinced legislators that genetically engineered crops are safe, and ‘substantially equivalent’ to conventional varieties of food and animal feed crops. But the scientific evidence, and documented animal safety tests, point in the opposite direction. The US government even attempted to have genetically engineered seeds and foods included under the National Organic Standards. Genetically engineered crops of corn, soy and canola that are herbicide resistant, and corn that produces its own insecticidal poison called Bt, get into the human food chain, and are put into livestock feed and pet foods with the government’s blessing: And quite probably to the demise of the honey bee and a large agricultural sector of bee-pollination dependent orchard and field crops.

Herbicide resistant crops actually absorb the herbicide that is repeatedly sprayed to kill competing weeds which we and the animals subsequently consume, along with whatever endogenous pesticides they have been genetically engineered to produce and have been treated with from seed to shelf.

As for the documented, peer-reviewed, published studies generally mandated by good judgment before the government’s approving any novel food, such as a genetically engineered one, there were virtually none made public before and after the Life Science Industry developed and patented new GM foods and animal feeds and put them on the market. In spite of world wide public opposition, GM crops and seeds have respectively come to dominate and

contaminate both conventional and organic food and industrial commodity crop markets. The oil-shortage panic move in the U.S to ill advised ethanol production from corn will mean more plantings of GM varieties, less land for livestock feed, and for human food-crop production to stockpile for humanitarian emergency relief food programs that are in more demand than ever with climate change. Arguably the worse case scenario of non-sustainable industrial agriculture is the U.S. government's commodity crop support program that subsidizes corn and soybean production---crops, now predominantly GM, that result in serious soil erosion and water pollution from agrichemicals--- at an estimated \$ 12.2 billion. Such subsidies are a disincentive to farmers to adopt more ecologically sound farming practices.

This Life Science industry, rising from its agribusiness commodity-crop, pet food, petrochemical fertilizer and pharmaceutical roots, became a star of investor hope in the World Trade Organization's new world order, and with free trade blessings. But its promises of better seeds and crops through genetic engineering that will benefit all, in spite of a now almost global domination, has caused far more harm to many than any good. The indirect and unforeseen costs far outweigh the short term benefits, which more and more governments and businesses are beginning to realize. The Life Science industry employs scientists to defend GM crops and the genetic engineering and cloning of farm animals, like oil companies employed scientists to say that global warming/climate change was a myth. They gave billions to Universities, setting up Chairs, Departments, Fellowships and lucrative consultative and patent sharing agreements, along with the US Chamber of Commerce. One of the first government employed scientist to blow the whistle on the health risks and unproven safety of GM foods was immediately fired. He worked for the same British government laboratory that collaborated with China to develop genetically engineered wheat. This good scientist, Dr. Arapad Pusztai whose research findings he has now shared with millions of concerned consumers around the world, were suppressed and loudly discredited by the Life Science government-industry-university complex. Their act of suppression gave Dr. Pusztai his world forum, and he came to this as an objective scientist with no bias pro or con GM foods. (For details see 'Genetically Engineered Crops and Foods---Scientific Documentation of Hazards to Health & Environment' on my web site www.doctormwfox.org).

CONCLUSIONS

From the above review it is evident that organic agriculture and holistic human and veterinary medicine have major roles to play in the end of days, as some call the collapse of the dominant culture of industrialism and consumerism, to help save our humanity from extinction, and the life and beauty of the natural world. They have major roles to play because they are of a different world view and bioethical basis than the dominant one of today that ignores the insight of Albert Einstein that the problems of the world cannot be solved at the same level of consciousness that caused them. This major role is not simply in better nutrition and health for all, but in the evolution of human species from a killer ape and global parasitic infestation to one that strives compassionately to establish a more symbiotic and co-creative relationship with the entire biotic community of this living Earth where peace, justice and respect for all life unify us in our sufferings and joy.

In the light of current trends, ---from climate change and its catastrophic global socioeconomic, environmental, agricultural and public health consequences, to the devastation being caused by a foundering WTO in these times of escalating conflicts, failing economies, resources, and markets, and rising populations and epidemics of disease and violence---the bioethical imperative of humane, sustainable, socially just and organically certified agriculture is enlightened self-interest. It is the highest form of altruism if we care not only for our own health and that of the planet, but also for the rights and interests of indigenous peoples, endangered species like wolf and whale, elephant and albatross, and the last of the wild: And conserve and preserve our native seed stocks and animal breeding stock for that more enlightened future. As the Pennsylvania Dutch farmers say, “We do not inherit the land from our ancestors, we borrow it from our children.”

There will be no tomorrows for today’s good seed- savers unless the children of damnation awaken to Earth’s sorrows and reverence all Creation. Some sage once said, ‘Until we suffer the earth as we suffer for ourselves and for our own kind, there will be no end to suffering.’ And as the late Loren Eiseley observed, “We do not find ourselves until we see ourselves in the eyes of those who are other than human.”

My friend Thomas Berry wrote ‘The glory of the human has become the desolation of the earth. This I would consider an appropriate way to summarize the twentieth century.’ But for me, I find seeds of hope in the practice and bioethics of humane, organic, and sustainable agriculture that can see us through the next century to a more enlightened and viable future.

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ADDENDA

Ethics and Trade

A quasi-ethical framework can be fabricated on primarily economic criteria, under the banner of “sustainability.” This is the situation with GATT (General Agreement on Trade and Tariffs) and the WTO, (World Trade Organization) and much of the international accord that the 1992 United Nations’ Conference on Environment and Development, the Rio Earth Summit, concocted. From the narrow materialistic perspective of GATT participants (who subsequently under pressure from public interest groups promised side-agreement correctives), a new world order for the human species was completed and ready to fly under the flag of world free trade.

The “new world order” created globalization of industrialism, drawing countries rich and poor into a world market economy. This is a formula for disaster if there are no ethical constraints to protect the environment, biodiversity, wild and domestic animals, human rights (especially labor laws and consumer safety), and cultural diversity. The World Trade Organization, comprised of international business bureaucrats, is already a shadow world government that sees the world as a vast marketplace. As economist David Korten says in his book *When Corporations Rule the World*, most development interventions that use foreign aid financing “transfer control of local resources to ever larger and more centralized institutions that are unaccountable to the people and unresponsive to their needs.”

This new world order, given the right ethical constraints, could become a formula for world peace and international cooperation, but only when the self-reliance of indigenous communities is coupled with sustainable local economies. It is unwise to create a dependence upon import-export markets because they are invariably volatile and can jeopardize national sovereignty and local economic security. David Korten in his book *The Tyranny of the Global Economy*, has shown why the public should not trust these powers but instead should reclaim their political power and reestablish localized economies. He summarizes his position as follows:

“The global economy has become like a malignant cancer, advancing the colonization of the planet’s living spaces for the benefit of powerful corporations and financial institutions. It has turned these once useful

institutions into instruments of a market tyranny that is destroying livelihoods, displacing people, and feeding on life in an insatiable quest for money. It forces us all to act in ways destructive of ourselves, our families, our communities, and nature. Human survival depends on a community-based, people-centered alternative beyond the failed extremist ideologies of communism and capitalism. This alternative is already being created through the initiatives of millions of people around the world who are taking back control of their lives and communities to create places where people can live and grow in balance with the living earth.”

The globalization of bioethics through the WTO and GATT , in the face of looming socio-economically devastating climate change, is clearly a moral and a survival imperative.

SYNOPSIS OF GLOBAL BIOETHICS (FROM FOX, 2000*)

Global bioethics calls us to give equally fair consideration to three spheres of moral concern:

- Human well being (rights and interests)
- Nonhuman well being (rights and interests)
- Environmental well being (biodiversity and ecosystemic integrity).

Global bioethics calls us to be accountable for our actions and appetites in relation to these three spheres; and to examine how well society, our politics, laws, economies (industry and commerce), religious, educational and other traditions and institutions, as well as our own personal lives, are in accord with the bioethical principles that unify these three spheres in the light and language of compassion, humility, and reverence for the sanctity of life.

Global bioethics calls us to actualize our natural, innate empathic sensitivity, moral sensibility and powers of reason, reflection, and also self-control by embracing the precautionary principle. Global bioethics calls us to consider the purpose and potentials of human existence, the significance of the virtues that make us humane beings, and our duties and responsibilities for the Earth community, and for the integrity and future of Creation.

Global bioethics calls us to understand and respect the cultural ecology of moral pluralism, and from this diversity of human beliefs, opinions, and desires, create a common ground of equalitarianism and respect for all life.

Global bioethics calls us to develop a unity of spirit for more effective and immediate crisis management, conflict resolution, and humane intervention where the compass of compassion directs reason and action toward world peace, justice, environmental and animal protection, conservation and restoration of biological and cultural diversity, and security and fulfillment for all sentient beings. Global bioethics promotes and unifies Earthcare, Peoplecare, Animalcare, and Healthcare for the good of all.

*For further reading, see my book *Bringing Life to Ethics: Global Bioethics for a Humane Society* (2000). New York: State University of New York Press.

THE SEVEN BIOETHICAL PRINCIPLES OF HUMANE, ORGANIC, SUSTAINABLE AGRICULTURE

1. Humane sustainable organic agriculture (HOSA) entails the production of domestic animal protein and fiber on the economically prudent basis of an ecologically sound animal husbandry and the wise and appropriate use of natural resources. Such husbandry aims to enhance or at least protect the natural biodiversity of indigenous wild plant and animal species, and does not result in environmental degradation and pollution.
2. HOSA is socially just, respecting human rights and interests, especially those of indigenous peoples and native, peasant, and family-farm cultures and traditions, since the preservation of cultural diversity has inherent value just as does the preservation and enhancement of natural biodiversity.
3. HOSA recognizes the connections between farm worker health and safety, consumer health and farm animal health and well-being. It respects the right of consumers of animal protein to wholesome and healthful produce derived from animals whose basic physiological, behavioral, and social needs and requirements, which are integral to their overall health and well-being, are fully satisfied by the methods of husbandry that are practiced. The use of veterinary drugs to maintain animal health and productivity is minimized by the adoption of humane animal husbandry practices, which in turn lowers consumer health risks.

Furthermore, animals' health and overall well-being are maximized, rather than sacrificed to maximize productivity. Maximal, sustainable

productivity is linked with optimal animal welfare, which in turn is linked with the optimal carrying capacity of the environment and availability of renewable natural resources.

4. HOSA is bioregionally appropriate, if not autonomous, linking livestock and poultry production with ecologically sound, organic crop and forage production systems and/or environmentally sound rangeland management.
5. HOSA does not engage in the import or export of any agricultural commodities, especially meat, wool, hides and animal feedstuffs, that have been produced at the expense of natural biodiversity and nonrenewable resources, and which undermine the rights and interests of local farmers and other indigenous people who practice sustainable, ecologically sound and socially just agriculture.
6. HOSA philosophically, is based upon the aphorism that we do not inherit the land, we borrow it from our children; it is ours only in sacred trust. This means, therefore, that HOSA entails respect and reverence for all life, its philosophy being Creation- or Earth-centered. It therefore embraces concern for the rights and interests of people, animals, and the environment. By so doing, it reconciles conflicting claims and concerns with the absolute right of all life to a whole and healthy environment and to equal and fair consideration.
7. HOSA provides the foundation for a community of hope and of a planetary democracy, whereby world peace, justice, and the integrity of Creation may be better assured. It leads to the recovery of culture, agri-culture being the cultivation of the land and the production of food based on a hallowing covenant that commits us to the sacred obligation of caring for the Earth by farming with less harm and eating with conscience.

FARM ANIMAL HEALTH AND WELFARE CONCERNS

Caged Laying Hens: Extreme overcrowding, lack of movement induced osteoporosis, bone fractures, foot lesions from wire floor, feather-picking and cannibalism.

Broiler Chickens: Extreme overcrowding, lameness, breast blisters, feather picking and cannibalism, ‘keel-over’ heart-failure from rapid growth. Penned

Piglets: Extreme overcrowding, boredom, tail-biting, cannibalism, lameness and foot lesions from concrete slat floors. Circulation and joint problems from rapid growth and body mass. Breeding Sows in crates: Extreme physical constraint, lameness, arthritis, boredom and stereotypic behaviors indicative of stress and distress. Veal Calves in crates: Extreme physical constraint, social deprivation, iron-deficient diet causing anemia and weakness. Feedlot Beef Cattle: Exposure-lack of shade and shelter, lameness and foot rot, liver disease from improper ‘fattening/finishing’ diets and lack of roughage. Confined Dairy Cows: Lack of exercise related lameness, metabolic, and liver diseases from high energy/concentrate diets and lack of roughage.

All the above concentrated animal feeding operations cause stress, distress, and increased disease susceptibility especially to enteric and respiratory infections, and to udder/mammary gland infections in dairy cows. Livestock transportation, handling, and slaughter methods need significant improvements in most counties. Transportation distances should be minimized because of stress, suffering and enhanced fecal bacterial contamination of carcasses during slaughter, a serious public health issue.

Dairy and beef cattle fed rations high in cereal grains are prone to acidosis, digestive and metabolic problems, and lameness from laminitis. Such diets create ideal conditions for the proliferation of *E. coli* 0157, thus putting consumers at risk (also from crops contaminated with infected manure and slurry run-off). Feeding a more natural, grass or hay-based diet results in a drastic reduction in *E.coli* 0157 within a few days.

THE HARMS OF GENETICALLY ENGINEERED CROPS AND FOODS

The agricultural biotechnology industry that calls itself the ‘life science industry’ with its patented varieties of genetically engineered/GM/gene-modified/transgenic seeds grew out of the vested interests of the petrochemical-pharmaceutical-agribusiness complex in monopolizing world agriculture. It succeeded, in spite of public outcry, in gaining government approval to market GM seeds at home and abroad, insisting, without any documented scientific evidence, that its patented seeds were safe, and so there would be no risks to consumers or of significant harm to the environment.

I believe that this is the most egregious, if not heinous business activity of the 21st century, and that there is now sufficient scientific evidence for a class action suit against all multinational corporations and allied governments to not only compensate farmers whose seed stocks and crops have been genetically contaminated by pollen drift from GM crops, but to also pay for a total recall of all such crops and seeds that are so prevalent as to now contaminate most basic food commodities. Ecosystems will have to be monitored for years, and all harvests, until the aberrant genetic constructs and toxic and mutagenic properties of GM crop origin are removed from the germ- lines of domesticated plants and their wild relatives.

One of the first government employed scientist to blow the whistle on the health risks and unproven safety of GM foods was immediately fired. He worked for the same British government laboratory that collaborated with China to develop genetically engineered wheat. This good scientist, Dr. Arpad Pusztai whose research findings he has now shared with millions of concerned consumers around the world, were suppressed and loudly discredited by the LifeScience government-industry-university complex. Their act of suppression gave Dr. Pusztai his world forum, and he came to this as an objective scientist with no bias pro or con GM foods.

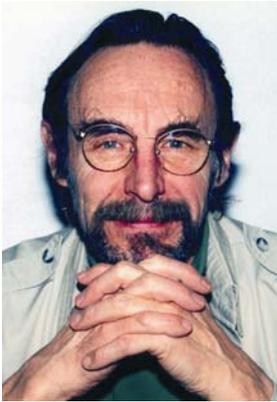
The compiled references by Dr Putzai and others on the health and environmental hazards of genetically engineered crops and foods (see www.doctormwfox.org) provide sufficient scientific support for such correctives and initiatives that are indeed in most urgent need of being implemented if the natural biodiversity and vitality of the plants and plant-based ecosystems of the world are to be protected and restored. It is already evident that new disease complexes can be triggered by GM foods in animals and humans that are extremely challenging to diagnose and treat. The best and only preventive is Organically Certified food. Perhaps in some more enlightened age, activities like those of the agri-biotechnology industry and the entire FDA complex, would be outlawed and prosecuted as Crimes against Nature as well as against Humanity.

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