

AMERICA'S FAILED FOOD PRODUCTION SYSTEM

With 12 recommendations for change

Prepared by DRK for TLF&NS- rev #1 October 30th 2009

Including a comment by Dr. Brinsfield, principal, the Wye Agro-Ecology Center

For the last 10 years our Foundation, Trappe Landing Farm & Native Sanctuary, has studied the reasons why the water quality in our Creek, LaTrappe Creek, a tributary to Chesapeake Bay from Maryland's Eastern Shore is increasingly in decline. Early on we realized through the studies of USGS and monitoring by the University of Maryland's Horn point Laboratory which along with our Farm is located in the Choptank Watershed that the problem started with the cardinal change in Agriculture which occurred after World War 11 involving a switch from a diversity of food crops and pasture raised animals to a two crop agricultural system featuring corn thus eliminating pasture raised animals. The animals were moved to feedlots now called CAFOs. All the corn raised on the Delmarva Peninsula is used to supply these facilities and most of our vegetables are shipped in from far away. Prior to the switch to industrial agriculture water quality and farming were compatible for at least 300 years. Most of the Nation including the great Mississippi watershed, which includes 41 % of the land area of the U.S. experienced this transition. The unintended consequences of the industrial revolution in food production took many years to show up and some are just now becoming apparent. Some of these consequences combine to make the U. S. food production system the unhealthiest in the world, an unfortunate fact that has finally emerged in open debate during this year's health care discussion. Other consequences are extremely dangerous particularly to nearby residents of the ²¹meat production facilities. One of the first consequences occurred after 3 decades as shown on the attached ⁴³graph. The underwater grass, which made the Chesapeake Bay unique as a species habitat substantially, disappeared from Bay tributaries by 1980. We now know that the transition to industrial agriculture has caused the Nation to lose its water quality, its topsoil, its health and that corn fed meat production is the number one cause of greenhouse gas emission. Before I suggest recommendations to fix this disaster I will briefly review each of these and cite my references so that readers can make their own judgment. The attached reference list with brief description was prepared also to support other papers. Some of the references are not used in this paper. Nevertheless each of the references is supportive of this papers conclusions and are all available on request.

WATER QUALITY

As a result of switching to the dominance of high nitrogen need ³⁶low uptake efficiency corn, and eliminating pasture, fertilizer application increased ⁴³8.3 times on the Delmarva Peninsula to a peak which leveled out in 1995 as shown on the attached graph but has since most likely continued rising since ³¹ethanol subsidies were initiated. I say most likely because this information is now kept secret in Maryland by the State's agricultural department. effectively under the control of farm lobbies. The political power of farm lobbies not only in government but also in research organizations, which are largely funded by the agribusiness sector, is in itself a major impediment to action as the Pew Commission points out (see #1 under solutions on the reference list). The same increase experienced on the Delmarva Peninsula where USGS assigns 94% of nitrogen pollution

to fertilizer and manure was also experienced in the Mississippi Watershed revealed by the ³⁰Gulf Hypoxia study and the subsequent 2008 ³¹PBS update. This study commissioned by the Clinton Administration involved a who of the national scientific community, and concluded that 90% of Gulf Hypoxia was caused by fertilizer from corn belt States, Their recommendation was a reduction in application rates. Agricultural interests succeeded in having the Clinton administration ignore the recommendation, which is still valid today. The following organizations rallied to kill the reports recommendation; the Fertilizer Institute, the American Farm Bureau Federation, and the American Corn Growers Association. Their letters and phony rebuttal research proposals exposed by the reports editorial staff are available on the site of the PBS update.

TOPSOIL

Single crop or double crop agricultural systems lose their ability to sequester carbon and expose the soil to wind and rain for large periods during the yearly growing and fallow cycle leading to loss of precious topsoil. This was documented in 2002 by excellent ⁵³photographs of soil samples from 15-year comparative studies at the Rodale Institute in Pennsylvania. This conclusion was also confirmed for all midwestern corn growing States by ⁵⁰S.A. Kahn's 2008 study "The Myth of Nitrogen Fertilization for Carbon Sequestration" at the University of Illinois. Studies were not needed in this case because it was obvious to anyone looking at rivers and streams following any major storm that extensive erosion was occurring. After the ⁵²Spring 08 Midwestern soil disaster when gullies 200 feet wide appeared in the fields of Iowa the most avid defenders of denuding massive acres of farmland to plant row crops were silenced. People over the years simply came to believe that erosion is inevitable in agricultural areas when in fact areas of the ⁵¹world have been farming for centuries using tillage and ample organic replenishment without this extreme erosion including the U.S. for several centuries before so called modern industrial agriculture started in the early 1950's.

HEALTH

The United States has transformed itself from a healthy society to number one in the world in obesity and diabetes and last in longevity. People who come here from other societies quickly fall victim to bad health. WHY? ¹⁶The National Cancer Institute in the largest human study ever conducted involving 500,000 adults over a 10 year period concluded that eating even a modest amount of red meat daily including pork reduced life expectancy significantly. ²Dr Loren Cordain reporting on research at the U. of Colorado shows that corn fed red meat is 7 times higher in saturated fat than grass fed meat. ¹⁴David Kessler's book "The End of Overeating" pointed out that food companies are deliberately designing processed food with just the right combination of fat and sugar to overcome the brains natural stop mechanism and appeal to a person's pleasure center resulting in the over consumption of their high sugar, high fat processed products. Most of the fat and sugar comes from 14 products made from corn. CAFO produced meat and processed food accounts for the bulk of food found in the US supermarket.

This year 2009 the press became aware of these issues. Time magazine had a cover ²²story "The Real Cost of Cheap Food" showing a package of Hamburger with a warning

label, which stated that this product is dangerous to your health similar to labels required on cigarettes. The Wall Street Journal in an editorial said, “call the 19% of kids who are obese the children of corn” and suggesting that the first thing that should be done is for the government to stop subsidizing corn. Corn fed Hamburger is a legitimate target not only because of its high saturated fat but because corn fed cattle and other ruminants lose their digestive system’s ability to kill e-coli in their hindgut. The production process places e-coli in the center of the patty. Corn fed hamburger is dangerous because its safe consumption is solely dependant on over cooking which puts the burden of food safety squarely in the hands of the consumer.

CAFO Meat Production:

Research by Dr. Silbergeld and other researchers at Johns Hopkins Bloomberg School of Public Health and around the world was reported in the ²¹June 09 issue of Johns Hopkins Magazine. They point to CAFO (Confined Animal Feeding Operations) as fundamentally unsanitary, perfect germ incubators, based on the flawed concept of raising food animals in their own feces. It is incredible that these facilities have been allowed to exist let alone grow to the point of dominating meat production without any protest from Local State or Federal authorities charged with public health and public safety. The existence of these facilities is in short a National disgrace and incredibly they now produce the majority of our cheap meat products. MRSA, Methicillin-resistant staphylococcus aureus is one of several pathogens that are incubated by the trillions in meat producing CAFOs. These perfect germ incubators also spawned mass incidents of avian flu on the Delmarva Peninsula in 2006. The current swine flu epidemic started in Smithfield’s Hog CAFOs in LaGloria Mexico in the spring of 2009. MRSA gets a lot of attention in the medical community because it is sometimes called the hospital pathogen since it has colonized in hospitals and clinics. It is also responsible for more deaths yearly in the United States than the aids virus. The ²¹Johns Hopkins Magazine report of this research suggests that these pathogens are brought to the hospitals and clinics by patients who work in CAFOs and by neighbors of these perfect pathogen incubators. This report refers to these facilities as extremely dangerous not only for the workers but for anyone nearby who is as likely to become contaminated by air or fly transmission as the workers themselves. People who eat meat grown in these facilities are becoming increasingly resistant to treatment with antibiotics. Legislation has been repeatedly introduced in the House to stop the practice of using regular dosage of antibiotics in the feed used in these facilities. The recent version HR 1549 is supported by 300 organizations including the AMA. Opponents point out that more animals will become sick and require treatment on an individual basis thus negating the effectiveness of the legislation. These opponents have a point. Most likely this law will end current methods of meat production or substantially change it. What is more likely to occur is total wipeout of animals in a facility as disease spreads rapidly in this perfect pathogen development atmosphere. This occurs frequently now on Delmarva and it certainly occurred many times in 2006 when 600,000 chickens died or were euthanized always on a total chicken house basis. The current unsanitary CAFO design is the problem and must be abandoned or drastically changed.

GREENHOUSE GAS

¹The Pew Commission concluded that CAFO facilities are the largest source of greenhouse gas in the world, larger than the transportation industry and recommended the

processing of their manure, which is much larger in volume nationwide than human waste. The Commission is an industry group including farmers and food distributors, which reached a broad range of conclusions many mentioned previously in this report.

SOLUTIONS

⁶⁰Ezra Klein a food writer for the Washington Post noting the above has reached the conclusion in a column that people must reduce their meat consumption, which he has done by limiting his meat meals to 5 per month. Americans are addicted to meat as noted by ⁷⁰Vaclav Smil in his book “enriching the earth” Smil indicates that Americans eat 75 grams of meat protein daily which is more than double the world average and that we consume 25 more grams than other developed Countries such as England. Would Americans voluntarily reduce their meat consumption if unhealthy food were labeled as such and if unhealthy food were more expensive? While they might I have not heard of any reduction thus far and these issues have been extensively reviewed in the press during the health care debate this year. In addition to individual dietary irresponsibility a case of massive abrogation of regulatory responsibility aided and abetted by flawed federal government subsidy policy is responsible for our poor national health. Agencies such as USDA, FDA, EPA, State and local health officials must have been aware of some of these situations at least since the ³⁰Gulf Hypoxia report was published in 2000 and the ¹Pew Commission report in 2008 and have taken no action except vote for continued subsidy of our unhealthy food system.

The following 12 actions should be initiated immediately:

1. Stop the use of low dose antibiotics in food animal production pass HR1549
2. Stop all grain subsidies or require farmers to accept all other recommendations listed as a condition for receiving grain subsidies.
3. Stop the practice of ²¹raising animals in their own feces in CAFOs and require daily cleanup of animal feces plus continual manure processing to energy and clean organic fertilizer which has been developed by several companies. Workers in these facilities must be required to wear full hazard suits when in the facility. The writer has a conceptual design for a facility that would be a sanitary solution for poultry and other small animals.
4. Residential neighbors of existing CAFO facilities should be examined by local health officials to determine that they are not colonized by pathogens. In some cases these neighbors are schools. Medical facilities which are likely to have treated exposed people should be examined and certified clear of pathogens by health officials.
5. Stop the practice of feeding ruminant animals corn and brewers grain a byproduct of the ethanol industry to allow these animals to return to health and reduce the production of e-coli in their hindgut.
6. Stop subsidizing corn-based ethanol, which in addition to destroying small motor carburetors, has increased the price of corn thus increasing corn production with all its health and environmental problems.
7. Start a commercial fertilizer reduction program for corn and other production row crops of 5% per year until some improvement in Chesapeake Bay, other East Coast Estuary’s water quality and Gulf of Mexico water quality begins to show up. Note this is the same recommendation proposed by President Clinton’s ³⁰panel of elite scientists but

implemented in a way that allows agriculture to gradually transition to a more diverse system including multiyear rotations with grass pasture included in the rotation.

8. Make it illegal to use monocropping and two crop rotations. Require farmers to use 4 crops in a rotation including some grass years in the rotation.

9. Require poultry companies to use poultry mixes already designed and in use by pastured growers, which reduce corn and increase barley, oats, wheat and alfalfa meal, this will increase crop diversity without affecting growing time or cost. Initiate research to determine if this concept is feasible for Hogs and other non-ruminant animals.

10. Have all process food including restaurant food subject to FDA approval specifically on the basis of its contribution to obesity and diabetes and consumer safety. Realizing that this is a huge undertaking start with a voluntary program paid for by the food industry where producers apply to have specific food products certified. This has worked well in the Fish Industry not only to protect many specific fisheries but also to cause these fisheries to prosper. Distributors such as Walmart, Whole Foods and many restaurants now only sell certified fish. This will eventually isolate bad food such as sodas, corn oil saturated fries, corn oil saturated chips, pizza, whoppers, bacon burgers, chicken nuggets, cereals with sugar additives, and other major contributors to bad health.

11. Have the FDA oversee all food labels to determine if they are consistent with national health objectives. Example; They must assure that bacon burgers a contributor to poor health are not presented in full screen to target audiences as the current Burger King ad which is directed to sports audiences.

12. The Local and Federal Government should promote aquaculture but only in ways that protect the production of natural feed fish, which are essential to our natural fisheries. The practice of using fish, meal in poultry feed is a good practice, which improves human consumption of omega 3 fatty acid severely curtailed in the American diet by the practice of feeding corn to ruminant animals and generally poor food choices. However the menhaden fishery in Chesapeake Bay a major source of fishmeal is of particular concern because menhaden is not only an important feed fish but also now that the oyster fishery has been destroyed it is the last major algae eater in the Bay.

Comment: re. "America's Failed Food Production System" submitted by Dr. Russell Brinsfield the director of the University of Maryland's Wye Agro-Ecology Center.

Don: Very well written and documented!! Compelling arguments--but just don't know how we can feed the ever increasing population by moving back to the ways we farmed when I was a kid. Russ

Response statement by Don Kerstetter-

I appreciate Dr. Brinsfield's comment because it frames the debate that must occur between those advocates of the status quo and some of us who believe that we can and must do a lot better if we are to save our two most important natural resources, our national health and curtail the largest source of greenhouse gas emission in the US.

HEALTH

1. Pew Commission report (4/08) on Industrial Farm Animal Production-Managed by the Bloomberg School of Public Health at Johns Hopkins University- Commissioners included ranchers, farmers, veterinarians, food distributors etc. The Commission consulted with a broad range of industry stakeholders and is indeed a true Agriculture and food industry report. Chaired by John Carlin former Governor. of Kansas and a former dairy farmer in Kansas. Conclusions; Industrial Animal Feeding Facilities (CAFO's) are deficient and must be changed as follows:

- Regular use of antibiotics in feed is the cause of an epidemic of diseases in humans.
- CAFO's are the largest source of greenhouse gas in the World.
- Animal waste production is huge, dangerous and needs to be treated
- Cites actions needed to reverse the economic destruction of rural Communities
- Cites actions necessary to stop the abuse of animals in CAFO's

2. Documentary KING CORN- released in 2007 featuring scientists and writers from the University of Virginia, Harvard Medical School, University of California Berkeley, University of Colorado and Iowa state University and Earl Butz former secretary of Agriculture in the 70's. - Focused on uses of corn in animal feed and in processed food production and the negative health consequences of both.

3. Kansas State research findings released Dec 4 2007 on E. coli 0157 and its connection to distiller's grain fed to cattle authored by T.G. Nagaraja and associates at Kansas State University. - Study showed that using distiller's grain a byproduct of ethanol production in cattle feed doubled e-coli 0157 in the hindgut of cattle.

4. Mycobacteria as Environmental Portent in Chesapeake Bay Fish Species- CDC report 2/07 by Andrew S. Kane, and Cynthia B Stine of the University of Maryland School of Medicine and Ana M. Baya Virginia/Maryland School of Veterinary Medicine College Park MD. Subsequent to the report Ms. Sine and Baya spoke at the Oxford Lab. They pointed out the direct relationship between nutrient and sediment polluted waters and the incidence of micobacteriosis.

5. What's worse than sugar- an article published in AARP magazine by Mark Francis Cohen a free lance writer from Washington DC quoting several scientific opinions about Hi-Fructose corn syrup's relationship to type II diabetes.

6. Grassfed Beef: A Value- Added Market Avenue- Published by the University of Tennessee Extension Service-Peg Hamlin, PhD.

7. Transporting Broiler Chicken report dated 11/24/08-Johns Hopkins School of Public Health. - The health hazard for humans following a chicken transporter on the highway.

8. Omnivore's Dilemma by Michael Pollan published in 2006.

There are 45,000 products on super market shelves, 17,000 new ones each year. Ingredients from the corn molecule dominate most of these. The criteria for development of these products are taste, cost, and appearance. There is little consideration given to nutritional value or food safety. It will take decades for the health consequences good or bad of these products to be revealed.

9. Interview with Dr. Martin Makary of Johns Hopkins University School of Medicine on January 29, 09. establishing the connection between high calories and memory loss in all ages Quote: " If you see hi-fructose corn syrup on the label put it back on the shelf" See a video of the interview on the following link http://www.foxnews.com/video-search/m/21810487/memory_boost.htm

10. Anticancer- a new way of life (Published in French in 2007 translated to English in 2008)- by David Servan-Schreiber MD.,Ph.D, He is a clinical professor at the University of Pittsburgh School of Medicine and cofounder of the Center for Integrative Medicine at the University. He is a 15-year brain tumor survivor. His book The Instinct to Heal was an International best seller and France's bestselling non-fiction book in 2004. Reinforcement of the connection between diet and cancer. Less meat, less processed food and more natural food including fruits, vegetables and fish is recommended.

11. Omega-3 fatty acid in eggs from range fed chickens by A. P. Simopoulos and N. Salem- New England medical Journal 321, no, 20 Artemis Simopoulos is former head of the department of research at The National Institute of Health. Research on the substantial out of balance between eggs from industrial chicken and pastured raised chicken. She has also published a study on the health advantages of a Mediterranean diet.

12. Fatty Acid Composition of Fats Is An Early Determinant of Childhood Obesity- by Gerard Ailhaud and Phillippe Guesnet-Obesity Reviews 5, no. 1 2004.

Research on rats and humans showed that either mother's milk or formula milk from today's corn fed dairy cattle with its out of balance between omega 6 and omega 3 fatty acid started infants with a propensity for obesity prior to birth.

13. Walter Willett- Harvard University- e-mail to DRK Spring 09-

Don- you will find **common ground among nutritionists** on the harmful effects of very cheap and large amounts of starch from subsidized corn in the US diet, which is the substrate for high fructose corn syrup, and very cheap sugary beverages and feedlot pork and red meat. While not the only contributors these are fueling our epidemics of obesity and diabetes."

14. The End of Overeating- by David Kessler former FDA Commissioner in Bush 1 and Clinton Administrations and former head of 2 Medical Schools. Published May 2009. Obesity in Americans discovered early in the decade of the 80's by CDC survey has increased rapidly in all age groups including children. US now leads all nations in obesity and diabetes. Food companies are deliberately designing food high in fat sugar and salt to

overcome the brains natural defense mechanism by exploiting the brains pleasure center. The majority of people but not all are victims of this addictive food.

15. Food Inc. a movie directed by Robert Kenner featuring Robert Schlosser author of Fast Food Nation and Michael Pollan author of Omnivore's Dilemma released June 09. - A visual depiction of life in a feedlot (CAFO) including interviews with involved farmers relating how our corn based industrial food system is causing our obesity and diabetes epidemics plus our exposure to e-coli and other food safety issues.

16. National Cancer Institute long term (10 year) study involving 500,000 middle aged Americans found "Daily red meat including pork raises chances of early death". Quantitatively people who ate more than 4oz. per day, one small hamburger or 2 slices of ham were 30% more likely to die early from cancer and heart disease. Editorials by nutritionist Walter Willet of Harvard University and Barry Popkin of the University of North Carolina accompanied the press release on March 24, 2009. The study also revealed that eating white meat including fish and poultry had a neutral effect on longevity.

17. The Fat of the Land- An editorial in the Wall Street Journal 8/1/09 which concludes: The obesity epidemic in the US is related to Corn based products the latest being processed food. The first step government should take is ending grain subsidies. Quote: "Call the 19% of kids who are obese the children of corn".
<http://online.wsj.com/article/SB1000142405297003609204574316022329001200.html>

18. Livestock antibiotics an issue in health overhaul- Article in the Star Democrat 8/5/09 describing legislation before the House, HR 1549, which restricts regular use of antibiotics in animal feed. The Bill is supported by 300 organizations including the AMA It is opposed by the poultry growers and pork growers associations.

19, Washington Post column by LaRue Huget 8/11/09- Report on the activities of Kelly Brownell head of the Rudd Center at Yale University. Brownell's article suggesting a tax on soda was published in the prestigious New England Medical Journal. His conclusion after years of obesity study "To effect real change we must shift the economic balance between healthful food and unhealthful food". Currently Government subsidized unhealthy food is also the cheapest food. Marketing limits should be placed on unhealthy food. To this point McDonalds currently has a full screen picture of an Angus bacon burger directed to sports audiences. How many kids will be attracted to this. We already have a 19% obesity rate among children as per the Wall Street Journal. (see 17 above)

20. University of Maryland Medical Center omega 6/omega 3 summary-Pub. 2009
" A healthy diet should consist of roughly 2-4 times more omega-6 than omega 3 fatty acid. The typical American diet tends to contain 14-25 more omega-6 than omega-3 and many researchers believe that this is the cause of the rising rates of inflammatory disease in the US. In contrast, the Mediterranean diet, which contains less meat, also consists of a

healthier balance between omega 6 and omega-3 fatty acid. Many studies show that people who follow this diet are less likely to have heart disease or cancer”.

21. Farmocology published by the Johns Hopkins School of Public Health <http://www.jhu.edu/~jhumag/0609web/farm.html> report on the troubling potential source of resistant pathogens in CAFO's or feed lots throughout the US but focused on the chicken CAFO's on Maryland's Eastern Shore. These facilities are perfect pathogen incubators producing trillions of pathogens currently resistant to antibiotics because of low level antibiotic use in animal feed. Pathogens are transmitted by workers who contaminate hospital facilities and clinics, by local air transmission to neighbors of these facilities, by flies, and by motorists who follow chicken transporters on the highway for an extended period of time.

22. Time Magazine Cover Story 8/31/09 “The Real cost of Cheap Food” by Brian Walsh. A comprehensive look at all the health and environmental issues created by our failed industrial food system.

23. Young dancer who will never walk again and family stricken by e coli from eating Cargill chefs select Angus hamburger. N.Y. Times 10/04/09.

WATER QUALITY

30. National Science and Technology Council Committee on Environment and Natural Resources- An Integrated Assessment of HYPOXIA in the Northern Gulf of Mexico- Report released for public comment in May 2000. One hundred and eight (108) scientists from many agencies both private and government including 20 major Universities nationwide were involved in the report including Donald Boesch President of UMCES. Conclusions:

Reduce nitrogen fertilizer application rates

Restore wetlands destroyed by the pervasive dominance of tilled farmland.

Results:

The American Farm Bureau Federation, the Fertilizer Institute and the National Corn Growers Association killed the recommendation by showing their ability to dominate the Governors of Corn Belt States including Iowa's governor Vilsack now our US secretary of agriculture.

31. PBS Update November 20, 2008 on Gulf of Mexico Hypoxia Report as it relates to increased corn production caused by the corn to ethanol subsidy. Also see NOAA paragraph for the original 2000 Hypoxia study including revealing letters of opposition to the reports conclusions. Also see rebuttals by Donald Boesch of the Editorial Board to bogus research commissioned by the Fertilizer Institute.

http://www.pbs.org/nbr/site/research/learnmore/mississippi_part-3/

32. Water Quality in the Choptank Basin- a summary of remarks made by Dr Thomas Fisher of the UMCES Horn Point Laboratory in a series of presentations in 2008- summarized by letter dated May 22, 2008. Major conclusion:

Agriculture is 80% the source of nutrient pollution in the Choptank

Reduce farm field fertilizer application rates
Ban residential chemical fertilizer usage
Nutrient treatment of septic systems

33. USGS circular 1228 page 6-Water Quality in the Delmarva Peninsula 1999-2001 published in 2004 by U.S. Dept of Interior and the U.S. Geological survey. See page 6, which shows the history of fertilizer application rates, which increased 8.3 times between 1950 and 2000. Sources of N pollution 59% fertilizer, 35% manure from chicken CAFO's. Nitrate levels at the 50-foot level increased 20% since the decade of the 80s.

34. USGS Water quality assessment of Delmarva Peninsula investigation results 1987-91

35. Distribution of Submerged Aquatic Vegetation (SAV) in Chesapeake Bay- a yearly report published since 1972 for Virginia and since 1978 for the Maryland portion of Chesapeake Bay by the Virginia Institute of Marine Science- The College of William & Mary. Reports showed that SAV's disappeared from the tributaries by 1980 with an overall depletion of 80%. SAV'S survived only in the clearer water near the Bay's mainstem.

36. Agroecosystems, Nitrogen-use Efficiency, and Nitrogen Management-Kenneth G. Cassman, Dept Head Agronomy and Soils-University of Nebraska-published by the Royal Swedish Academy in 2002. Found that corn is the highest of cereal grain crops in nitrogen need, and is the lowest in uptake efficiency at 37% in average rainfall years. Uptake efficiency can approach zero during severe drought years. Recommended precision management of fertilizer application to increase uptake efficiency. Suggested in an e-mail to DRK that the best solution for N leaching in the porous soil of Coastal Plain watersheds was the growing of hi-value crops where the economics support precision management techniques.

37. Increasing Retention in Coastal Plain Agricultural Watersheds- by Kenneth Staver. University of Maryland College of Agriculture Wye Research Center. The principle pathway for nitrogen to reach surface water is through the aquifers in the porous soil of Coastal plain watersheds suggested the use of cover crops to soak up excess nitrogen while it is still manageable in the root zone. Study based on small plot studies.

Effectiveness on a tributary scale is unknown as reported by the USDA CEAP team and in monitoring of Choptank water quality since State subsidy and substantial farm field implementation began 5 years ago.

38. Talbot County Creekwatchers Report 2007 showed that every water quality parameter has had a significant decline continuing a trend that has existed since reporting began in 1999.

39. Harmful Algal Blooms and Eutrophication: Donald M. Anderson- Woods Hole Oceanographic Institution, Patricia Gilbert UMCES Horn Point Laboratory

40. Dynamics of Phosphorous transfers from heavily manured Coastal Plain soils to drainage ditches by P.J.A Kleiman et.al. 8/07 research conducted at University of Maryland Eastern Shore campus in Princess Ann MD. a former poultry production site. Showed that field trenches are the principle pathway for phosphorous which uncouples from soil particles in stream flow suggesting curtailment of use of this common practice and the need for gutters to manage water flow from CAFO roofs. Field experience in a field just upstream from TLF&NS showed the effectiveness of not trenching these water pathways and retaining more water in the field.

41. Journal of Water and Soil Conservation- June 09- Nitrate levels in the Des Moines River in Iowa show the same pattern as the Choptank at Greensboro except they are 5 times higher approaching the EPA health maximum of 10mg/l.

42. PBS documentary “Poisoned Water” aired Spring 09 focused on the effect of chicken manure from CAFO production facilities on the Delmarva Peninsula. The contamination of East Coast waters caused by 12 billion pounds of untreated manure from these facilities exacerbated by location in coastal plain watersheds on Delmarva, North Carolina, South Carolina, Georgia, Alabama, Mississippi and Arkansas is also referenced in the Pew Commission Report. The pollutants nitrogen, phosphorous, antibiotics, growth hormones, heavy metals and perhaps others unknown in chicken feed is problematic not only for water quality but for health. We do know about antibiotic resistance, which hopefully is being addressed in Congress. We know a little about early puberty in girls. Much more research is required which will likely lead to full treatment of animal waste from CAFO’s Nationwide. There are systems such as proposed by Eagle Green Energy which can convert this liability into energy and clean organic fertilizer.

43. Nitrate record long term for the Choptank River based on research of the University of Maryland’s Horn Point Laboratory 30 plus years monitoring coupled with the nitrogen fertilizer graph for the Delmarva Peninsula reported in USGS Circular #1228 pg 6. This graph includes dates when major destruction milestones occurred in both water quality and health.

44. Local Chapter of The Soil and Water Conservation Society 2008 Spring Tour DRK Visit to Caroline County chicken CAFO revealed aquifer readings off the corners on the downslope side of 15 and 80 mg/liter in April when the aquifer level was at 2.5 feet. This turns out to be one of two sites being monitored by MDE and the only sites ever tested. Site engineers believe that spillage over the 20 year life of both these facilities is responsible. A later site visit by DRK revealed that they had replaced the old manure shed, which the writer believes was the location of the 80-mg/l reading. They had also installed housekeeping pads on either end of the building. Engineers indicated that both sites had about the same readings in the aquifers. They refused DRK’s request to install a monitoring well under the building. MDE is working on a regulation to permit these sites, which is being resisted by the Delmarva Poultry Industry.

45. Documentary Big River- this is a followup to King Corn which starts immediately after the massive soil erosion disaster in Iowa in the Spring of 08. It also investigates the

environmental impact that their acre of corn has had and continues to have on lives of people downstream including the destruction of the fisheries in the Gulf of Mexico. (this could be listed under health, water, or soil because it covers all three)

SOIL

50. The Myth of Nitrogen Fertilization for Carbon Sequestration by S.A. Khan Feb 2007- scientists at the University of Illinois reporting on the results of field studies throughout the Corn Belt States showing that 11 of 12 corn belt states are losing soil carbon over decades. *The widespread loss of carbon from soil has a huge impact not only on soil erosion but also greenhouse gas emissions since soil is the largest reservoir of carbon on the planet.*

51. USDA Farmers bulletin 2279 April 2001- Reporting that 40% of farmland in the US is eroding at a rate greater than 5 tons per acre per year. Recommendation is to use sustainable farming methods. *Report verified by Spring 08 Midwest soil erosion disaster.*

52. A 50 year Farm Bill- An article prompted by the Spring 08 Midwestern soil erosion disaster published by The NY Times 1/04/09 co-authored by Wes Jackson President of the Land Institute and author/farmer Wendell Berry. Quote;
“The historic rainstorm in June 08 caused catastrophic soil erosion in the grain lands of Iowa, where there were gullies 200 feet wide. But even worse damage is done over the long term under normal rainfall—by the little rills and sheets of erosion on incompletely covered or denuded cropland, and by various degradations resulting from industrial procedures and technologies alien to both agriculture and nature. Civilizations have destroyed themselves by destroying their farmland. This irremediable loss, never enough noticed has been made worse by huge monocultures and continuous soil-exposure of the agriculture we now practice.”

53. Rodale Institute 15 year samples visually depicting a 3 crop rotation using composted animal manure versus a 2-crop rotation using chemical fertilizer. Samples are photographed in the hands of Ray Weil a soils scientist with the University of Maryland. *Samples depict visually the difference in soil carbon, tilth and humic content between the two agricultural systems and visually demonstrate the problems caused by the current Industrial system on the Nations soil and the ramifications for greenhouse gas emissions.*

54. Filmed soil erosion events at Trappe Landing Farm & Native Sanctuary when fields were trenched to evacuate water compared to untrenched fields.

55. Visual evidence during aerial over flights of Talbot County after rainstorms.

56. Visual observation during the Spring 09 rains which occurred during the planting season when fields were most exposed due to denuding of field growth prior to planting.

GREENHOUSE GASES

1. Pew Commission report (4/08) A study of Industrial Farm Animal Production-managed by the Bloomberg School of Public Health at Johns Hopkins University-Commissioners included ranchers, veterinarians, food distributors etc. Chaired by John Carlin former Governor. of Kansas and a former dairy farmer in Kansas. One of the reports major findings was:

Industrial Farm Animal Production Facilities (IFAP) often referred to, as CAFOs or Feed Lots are the largest source of greenhouse gas emission in the world larger than the transportation industry, which is 2nd.

The Pew Commission also found that CAFOs are a health hazard for those living within 3 miles of a facility. Quote: Communities near IFAP facilities are subject to air emissions that can significantly affect certain segments of the population. Those most vulnerable children, the elderly, and individuals with chronic or acute pulmonary or heart disorders are at particular risk. The impacts on the health of those living near IFAP facilities have increasingly been the subject of epidemiological research. Adverse community health effects from exposure to IFAP air emissions fall into two categories: (1) respiratory symptoms, disease and impaired function, and (2) neurobehavioral symptoms and impaired function.

Locally the Whitmarsh School is within 1 mile downwind of a Chicken CAFO. The MDE person I checked with was not aware of the Pew Commission report. She said that they only respond if they get an odor complaint.

60. The Meat of the Problem by Ezra Klein food writer for the Washington Post Aug 09. His research indicated that meat production was the largest source of climate change. Quote: "It's not simply that meat is a contributor; it's that it is a huge contributor. Larger by a significant margin than the global transportation sector." Mr. Klein describes how he is personally trying to do his part for the planet. He first gave up bacon, which he loves, for breakfast then for lunch. He then was able to reduce his meat consumption to 5 meat meals a month and he really looks forward to those meals.

SOLUTIONS

1. Pew Commission/ Johns Hopkins School of Public Health report 4/08 states that Industrial scale Farm Animal Production (IAFP) poses unacceptable risks to public health and the environment and makes 6 recommendations as follows:

A. Ban the use of non-therapeutic antimicrobials in food animal production to reduce the risk of antimicrobial resistance to medically important antibiotics.

B. Implement a disease-monitoring program for food animals in a robust national database.

C. Treat farm animal as an industrial operation and implement a new system to deal with farm waste to protect Americans from adverse environmental and human health hazards of improperly handled farm animal waste.

D. Federal and State laws need to be amended and enforced to provide a level playing field for producers when entering contracts with integrators.

E. Phase out the most intensive inhumane production practices to reduce risk to public health and improve animal wellbeing (gestation crates, battery cages etc).

F. Expand funding for research directed to farm animal production reform.

Statement by Chairman John Carlin former Governor of Kansas and a dairy farmer- “I believe that the IFAP system was first developed to simply help increase farmer productivity and that the negative effects were never intended. Regardless, the consequences are real and serious and must be addressed”.

Statement by Vice Chair Michael Blackwell Dean of Veterinary Medicine at the University of Tennessee and former Surgeon General USPHS- “Our energy, water, and climate resources are undergoing dramatic changes that in the judgment of the commissioners, will require agriculture to transition to much more biologically diverse systems, organized into biological interactions that exchange energy, improve soil quality, and conserve water and other resources. Long-term success will depend on the nations ability to transform from an industrial economy that depends on rapidly diminishing resources to one that is more sustainable, employing renewable resources and understanding of how food production affects public health and the environment”.

Statement by Robert Martin the Executive Director of the study.

“There have been serious obstacles to the Commission completing its work. We found serious influence of the Industry at every turn. The major threat was to scientists who were threatened by loss of Industry funding to research Institutions. Dwight Eisenhower warned of the danger to the nation of an alliance between the Defense Industry and their friends on Capital Hill. Now the agro-industrial complex an alliance between agricultural commodity groups, scientists at academic institutions who are paid by the Industry and their friends on Capital hill is of concern in food production in the 21st century.”

70. Enriching the Earth- by Vaclav Smil-Fritz Haber, Carl Bosch and the transformation of World Food Production- Published by MIT Press in 2001 republished in paperback in 2004. Smil’s pathway to zero chemical nitrogen use in the US refutes the argument that people would starve if chemical nitrogen fertilizer were eliminated is as follows:

Eliminate exports of corn and meat	-3.5 Mt
Reduce per capita animal protein from 75 g/day to 50g/d the average in Great Britain and other developed countries.	-1.7 Mt
World average about 30 g/day	
Reduce waste from 80% to 20%	- 1.2 Mt
All Americans adopt a healthy Mediterranean diet	-1.2 Mt
Total	-7.6 Mt

Current US usage is at 10.5 Mt – 7.6 = 3 Mt an amount easily maintained by crop residues and animal manure.

Writers comment: This very long book, which thoroughly explores the technical development of nitrogen synthesis, also suggests solutions to the loss of our health and natural resources.

I One third of our corn based production including corn itself is exported which begs the question should we be squandering our precious natural resources for the benefit of other nations and the profits of exporters.

2. Most nutritionists agree that the Mediterranean diet which limits meat consumption, uses olive oil instead of corn oil and with a heavy emphasis on fish is the healthiest diet.

3. We are destroying our precious natural resources to produce corn based food which is 80% wasted. Does this make sense?

71. BusinessWeek 5/14/09- The Great Ethanol Scam- Ethanol fuel additive costing owners of small motors including lawnmowers and outboard motors and even automobiles thousands of dollars in repair bills while scientific studies are mixed on whether it is a small gain or small loss in overall energy consumption.
Corn/ethanol has also raised the price of corn, which militates against farmers changing to a more sustainable agricultural system.

72. Grasslands: The Future of Sustainable Agriculture- Published by Professors of agronomy at Iowa State University, The American Society of Agronomy founded in 1907, Crop Science Society of America founded 1955, and The Soil Science Society of America founded 1936.
Pasture raised animal production can be a very important part of a comprehensive solution including major positive impact on health, water quality, soil loss and greenhouse gas emission.

60. The Meat of the Problem by Ezra Klein food writer for the Washington Post Aug 09. His research indicated that meat production was the largest source of climate change. Quote: "It's not simply that meat is a contributor; it's that it is a huge contributor. Larger by a significant margin than the global transportation sector. Mr. Klein describes how he is personally trying to do his part for the planet. He first gave up bacon, which he loves, for breakfast then for lunch. He then was able to reduce his meat consumption to 5 meat meals a month and he really looks forward to those meals.

73. The Fat of the Land- An editorial in the Wall Street Journal 8/1/09 which concludes: The obesity epidemic in the US is related to Corn based products the latest being processed food. The first step government should take is ending grain subsidies. Quote: "Call the 19% of kids who are obese the children of corn".
<http://online.wsj.com/article/SB1000142405297003609204574316022329001200.html>

74. Livestock antibiotics an issue in health overhaul- Article in the Star Democrat 8/5/09 describing legislation before the House, HR 1549, which restricts regular use of antibiotics in animal feed. The Bill is supported by 300 organizations including the AMA the poultry growers and pork growers associations oppose it.

75. Washington Post column by LaRue Huget 8/11/09- Report on the activities of Kelly Brownell head of the Rudd Center at Yale University. Brownell article suggesting a tax on soda was published in the prestigious New England Medical Journal. His conclusion after years of obesity study "To effect real change we must shift the economic balance between healthful food and unhealthful food". Currently Government subsidized unhealthy food is also the cheapest food. Marketing limits should be placed on unhealthy

food. To this point McDonalds currently has a full screen picture of an angus bacon burger directed to sports audiences. How many kids will be attracted to this. We already have a 19% obesity rate among children as per the Wall Street Journal. (see 17 above)

32. Water Quality in the Choptank Basin- a summary of remarks made by Dr Thomas Fisher of the UMCES Horn Point Laboratory in a series of presentations in 2008- summarized by letter dated May 22, 2008. Major conclusion:

- Agriculture is 80% the source of nutrient pollution in the Choptank
- Reduce farm field fertilizer application rates
- Ban residential chemical fertilizer usage
- Nutrient treatment of septic systems

76. Subsurface Drip Irrigation systems- see study published in American Society of Agriculture Engineers vol. 20(2) 2004 and e-mail to Professor Lamm Kansas State University from DRK reporting on conversation with farmer Wendell Nicholas of Big Bow Kansas dated 3/29/07. 15,000 acres performing with satisfactory economics in semi-arid SW Kansas.

36. Agroecosystems, Nitrogen-use Efficiency, and Nitrogen Management-Kenneth G. Cassman, Dept Head Agronomy and Soils-University of Nebraska-published by the Royal Swedish Academy in 2002. Recommended precision management of fertilizer application to increase uptake efficiency. Suggested in an e-mail to DRK that the best solution for N leaching in the porous soil of Coastal Plain watersheds was the growing of hi-value crops where the economics support precision management techniques.

20. University of Maryland Medical Center omega 6/omega 3 summary-Pub. 2009
“ A healthy diet should consist of roughly 2-4 times more omega-6 than omega 3 fatty acid. The typical American diet tends to contain 14-25 more omega-6 than omega-3 and many researchers believe that this is the cause of the rising rates of inflammatory disease in the US. In contrast, the Mediterranean diet, which contains less meat, also consists of a healthier balance between omega 6 and omega-3 fatty acid. Many studies show that people who follow this diet are less likely to have heart disease or cancer”.
Wide adoption of a Mediterranean diet with substantially less meat and or pasture raised meat and dairy products along with avoidance of corn based processed food would result in less corn production improved water quality, soil retention and less greenhouse gas. How do we accomplish wide adoption?

77. See DRK letter to Russell Brinsfield dated 2/11/2008 forwarding broiler mixes designed by Fertrell Company which cut corn by 2/3 and which introduce barley and oats.

This would have the effect of reducing corn on Delmarva resulting in substantially less nitrogen fertilizer usage and increase in overall uptake efficiency plus it would increase the use of 2 more crops in rotations which is the biggest factor in improved soil quality. Letter was also sent to Satterfield the E-director of the Delmarva Poultry association and an executive VP at Perdue farms. No responses received. This lack of response to

what seems like a reasonable and substantial benefit to water and soil quality on Delmarva substantiates the conclusion of the Pew Commission E-director in #1 above

37. Increasing Retention in Coastal Plain Agricultural Watersheds- by Kenneth Staver. University of Maryland College of Agriculture Wye Research Center. The principle pathway for nitrogen to reach surface water is through the aquifers in the porous soil of Coastal plain watersheds suggested the use of cover crops to soak up excess nitrogen while it is still manageable in the root zone. Study based on small plot studies.
Effectiveness on a tributary scale is unknown as reported by the USDA CEAP team and in monitoring of Choptank water quality since State subsidy and substantial farm field implementation began 5 years ago.

54. The Real Cost Of Cheap Food- Time Magazine article 8/31/09 by Brian Walsh.- a comprehensive review of the American industrial agriculture/food system and its adverse affect on water quality, soil, greenhouse gas, and health. The solution focus is on pasture based farming systems, an increase in smaller farms, more farmers and farm workers. In addition it is suggested that paying double for quality food is a substantially better value.

78. The Leopold Center for Sustainable Agriculture at Iowa State University- answer to DRK on the reluctance of scientists to support an obviously flawed agriculture/ food production system in the US.
Fred Kirchenmann is the former director of the Leopold Center and a farmer in North Dakota. In this letter he refers to research at Iowa State University which supports the better financial return to farmers of adopting systems which improve soil quality and reduce chemical inputs which are destroying water quality nationwide.

NOTES

1. Writers opinions and conclusions are underlined
2. All studies, reports and articles are available by contacting the writer D.R. Kerstetter at Trappe Landing Farm & Native Sanctuary 410-476-3366 or (kerstis@verizon.net)