

AN OVERVIEW OF THE NEW CULTURE OF AGRICULTURE

There is a huge movement across the nation to buy and eat locally-grown food, thus creating a sustainable agricultural model. This includes the decision to eat only animals which have been raised on pastures and to purchase organic produce grown locally. We will discuss two tenets of the sustainable movement: pastured grassfed animals and buying locally. We will touch on the industrialization of corn and why this might cause you worry. We will also discuss and define three more interests of the movement: genetically modified organisms (GMO) or genetically modified (GM) seeds, nutritionalism and humanely treated animals.

Question #1. What is grassfed, pastured? Why not feed ruminants corn? Why is grassfed better? What is the new certification?

Grassfed means the animal, in this case, cattle, are raised on grass, the natural food of this ruminant. Pastured means the animal is allowed pasture (with plenty of room to move around), in all temperate weather. Multi-stomached animals were made to eat forages. They fill a wonderful place in the web of life in that they convert low-energy forages into extremely nourishing food.

Most of the beef on America's tables comes from animals which have been finished at a feedlot. In the 1950's it was discovered that feeding cattle grains (mostly corn) would produce more fat and marbling than beef raised strictly on grass and America was on its way to cutting her meat with a fork rather than cutting it with a knife. The fat produced in feedlots is white and full of saturated fat. The yellow fat of grassfed, pastured animals reflects high levels of chlorophyll, a good thing in the diet, and low levels of saturated fat. Grassfed beef has its fat on the outside and there is little muscle fat or marbling. The finished product looks more like venison with some backfat but little fat in the muscle.

Feedlots are overcrowded and unsanitary. The animals stand in their own excrement and that of many of other cattle for most of the eight weeks to six months it spends on the confined feedlot thus producing soil from which the rainwater run-off poisons our water and air so full of methane that it poisons the very air that they (and we) breathe. How can this be good?

Cattle have evolved through thousands of years to be grass eating animals. The grass passes through three stomachs producing a protein laden meat. On the feedlot animals are fed a diet of grain and they are given a series of antibiotics to prevent illness and disease. These antibiotics can be passed on to you in their meat and you can develop an immunity. Then when you get sick the antibiotics do not work for you.

Most cattle are raised in grassfed, pastured conditions until they are sold and moved to the feedlot (this, of course, does not include commercially raised baby veal which is strictly confined its whole life). If the animal remains on grass and pasture, the finished meat contains: more beta-carotene, vitamin E, C & CLA (conjugated linoleic acid), less overall fat and calories, and a better ratio of Omega 3's to Omega 6's. If

it is raised on natural grasses in a natural, healthy way, using no growth hormones, steroids, or pesticides; the whole process is better for the environment and you. And this is the way it used to be.

The ability to sustain a lasting environment is a key ingredient of the new food or agriculture culture. In the case of beef this is done by using no insecticides or fertilizers (these leave behind a barren soil), antibiotics or cereal grains, no added growth hormones or steroids, fertilizing only naturally and organically, providing plenty of fresh grass, clovers and legumes, and planning for a healthier ecosystem, with no waste, water pollution or soil depletion. This produces cows that are healthier with less disease and illness and makes for a lasting environment.

The new agricultural movement includes humane treatment of animals. This means everything from abundant clean space to move around in, stress free handling (taking care when moving or working with the animals to ensure compassion for the animal's natural behavior), no long distance transporting, protection from the elements, and their natural food.

The U.S. Department of Agriculture (USDA) is responsible for certifying the organic label and when used does certify a whole host of things (You can find a list of rules and regulations at www.USDA.gov, then search National Organic Program.) Of interest is that the organic label issued by the USDA does not allow the use of genetically modified organisms. Many labels and certification programs are, at this time, in a continual state of flux. Consumers should try to read and keep up with the variations and shop accordingly.

In October of 2007, the USDA issued their definition of "grassfed" as animals that were fed a forage diet even when the animals were confined to feedlots and given antibiotics and growth hormones. The American Grassfed Association (AGA) refused this definition. In 2009, the AGA issued its own certification.

AGA thought that consumers' expectations about grassfed meat were clear. They expected grassfed to mean grassfed period. Not mostly grassfed, not mostly unconfined, not mostly without hormones or antibiotics, and not mostly without grains. They also thought that grassfed conjures up a picture of animals roaming around a lovely pasture eating grass torn with their own teeth. AGA standards for certification include a total forage diet, no antibiotics and no hormones. These standards are only for ruminants, cattle, sheep, bison and goats. Poultry and pigs are not included.

The AGA teamed up with the Animal Welfare Approved program which is audited by the American Welfare Institute. Those who achieve the certification may use both labels on their products. Thus this certification tells the consumer that the animal has been well fed and humanely treated from birth to death.

Question # Two. What does it mean to buy locally and why would you want to do so? What does eating in season mean? Are locally grown vegetables better for the environment? Can you personally meet the farmer who gathered your eggs? What are GMOs and should I be worried?

Buying locally involves a whole philosophy of sustainable food production. If you buy only produce and products produced locally you are voting with your dollars for a way of life which does not include shipping produce across the country or from country to country on huge refrigerated trucks, airplanes, or railroads. You are eating what is grown in your neighborhood at the time it is harvested in your area of the world. It is said by Stephen L. Hopp in the book Animal, Vegetable and Mineral that if every person in the United States ate just one meal a week (any meal) composed of locally and organically raised meats and produce, we would reduce our country's oil consumption by 1.1 million barrels every week.

To buy from your local farmers markets means you are eating produce which was harvested this morning or yesterday and retains its crispness, freshness, minerals and vitamins. When you buy lettuce grown locally it will stay fresh in your refrigerator for over a week (the time it would have taken it to travel from Chile or California and to be stocked on your supermarkets shelves.) When you buy organically you are eating products that have been produced with no GM seeds and grown without insecticides or pesticides. There will be no poisonous residue on your lettuce or tomatoes.

To buy from your local farmers market means that the eggs you purchase are from hens that have been pastured and allowed to roam and peck for the grubs and bugs they love, thus aerating the soil and moving essential nutrients around the pasture, not to mention their own fertilizing of the soil in small sustainable amounts. Commercially grown chickens are put into small cramped cages, stacked one on top of the other in an enclosed space, with no room to turn around. They have been dosed with antibiotics and hormones. They have had their beaks cut to deter their natural pecking behavior. Their urine flows from one level to the next, producing a hen house floor with levels of contamination that detrimentally influences our water supply.

At a local market you can question where or how the eggs were brought to market and the local farmer is there to answer your questions and/or you can visit his farm and see for yourself. It is not in the scope of this paper to discuss the horrors of animals grown in commercial hen houses, hog pens or feedlots, but if this happens to chickens, you can be sure the lives of other commercial animals are no better. Over 80 to 90% of the eggs and chickens eaten in the United States are produced in this way.

Wikipedia says that a genetically modified organism (GMO) or genetically engineered organism (GEO) is an organism whose genetic material has been altered using genetic engineering techniques. These techniques, generally known as recombinant DNA technology, use DNA molecules from different sources, which are combined into one molecule to create a new set of genes. This DNA is then transferred into an organism, giving it modified or novel genes. Transgenic organisms, a subset of GMOs, are organisms which have inserted DNA that originated in a different species. Some GMOs contain no DNA from other species and are therefore not transgenic but cisgenic.

Why do you care about seeds that have been genetically modified? Because no long term research has been done on their effect on you or the environment. After all these years there are still only a handful of serious tests on these products and their effects. Genetically modified seeds are patent protected. These

patents ensure that the farmer must repurchase seeds every year if he desires to plant the same kind of crop. In fact, if a farmer grows a GM corn seed he has to repurchase the seeds the following year. In the old days farmers saved seed for reuse, saving many different varieties, many specially adapted to certain soils and terrains. This can be expensive and is one of the arguments offered when the claim is made that GM seeds can provide more food for emerging nations. These seeds will likely never be used by poor farmers because they are too expensive.

GMOs have sparked significant controversies. Some see GMOs as meddling in biological processes that have naturally evolved over the years. Some groups are concerned that all the negative results of genetic manipulation are not fully comprehended. And considering the almost complete lack of testing on persons or the environment probably all the negative or positive ramifications are still unknown. In the U.S. the Food and Drug Administration Center for Food Safety and Applied Nutrition must approve the nutritional characteristics of GMO foods on the basis of comparability to conventionally-produced food. What does that mean? GMO foods must mostly look like their conventionally-produced counter-point. Do you really care if they look alike or do you want them to have real food value?

And there is now a move to make GM seeds sterile. But the producing companies will be happy to sell you a spray to infuse the sterile seed so it will produce the next year. Our food supply is being taken over by companies whose only interest is in selling you seed year after year. In 2007, Monsanto's trait technologies (specific traits in GM seeds) grew to 246 million acres worldwide, a growth of 13 % from 2006. We are losing hundreds of varieties of everything from corn to potatoes because only one type of seed variety is used.

If we are what we eat and what we eat does not have the genetic makeup we think it has, then what are we?

Question #3. What do we mean when we talk about the industrialization of our food products? What's with the corn? Are we really "corn" animals? What is wrong with corn?

One of the best examples of what has happened to our food product is the industrialization of corn.

Corn is thought to have originated in central Mexico and was already in our area by the time the Pilgrims arrived. The Native Indians taught the settlers to plant and use corn. It is much better adapted to this area than the European wheat which they brought with them. It is faster growing and produces more food than wheat. It is versatile. The plant provided a fresh vegetable, a storable grain, a source of fiber and animal feed, a heating source, and an intoxicant. In fact, its versatility is what makes it not only a food source but also a commodity. The farmer, having satisfied his own food needs takes the rest to market as a commodity for sale. During slave times corn was used both as the money which paid for the slave as well as the food to sustain him on his passage to America. Today after the corn kernel is removed, corn is processed into a myriad of products.

To read a very informative description of how corn developed and its relationship to man, read the first few chapters of Michael Pollan's book The Omnivore's Dilemma. There are numerous processed corn items in the marketplace. Suffice it to say that corn is in most of the processed things we eat and a lot of what we drink. Take the chicken nugget: what chicken it does contain comes from chickens who ate corn, modified corn starch holds the factory processed pieces together, there is corn flour in the coating, and it is fried in corn oil. The leavenings and lecithin, the mono-, di-, and triglycerides, the golden coloring, and the citric acid used as a preservative can all be derived from corn.

Choosing almost any soft drink from the supermarket to have with your meal is adding more corn to corn. Grab a beer and drink corn in the form of alcohol fermented from glucose refined from corn. On the label of any processed food read corn for modified and unmodified starch, for glucose syrup and maltodextrin, for crystalline fructose and ascorbic acid, for lecithin and dextrose, lactic acid and lysine, for maltose and HFCS (high fructose corn syrup), for MSG (monosodium glutamate) and polyols, caramel color and xanthan gum. Corn is in frozen yogurt, TV dinners, canned fruit, ketchup, candies, soups, snacks, cake mixes, frosting, gravy, frozen waffles, syrups, and hot sauces. Corn is also in the coffee whitener, Cheez Whiz, mayonnaise, mustard, hot dogs, bologna, margarine, shortening, salad dressing, relishes, and your vitamins. More than a quarter of the forty-five thousand items in the supermarket now contain corn.

Non-food items containing corn include: toothpaste, cosmetics, disposable diapers, trash bags, cleaners, charcoal briquettes, matches, batteries, and the shine on the magazine cover. Corn is found in the vegetable wax which gives the vegetables their shine, the pesticides which produce perfect vegetables, and the coating on the cardboard shipping crate. Even in the supermarket itself corn is manifested in the wallboard, joint compound, linoleum, fiberglass, and adhesives.

Corn in and of itself is not the culprit, but by making corn (a food) into a commodity we have encouraged its growing use. Because corn is so adaptable it has supplanted a lot of the other things we would have been eating, even other whole grains. Current thinking is that by displacing so many other food items we are not eating enough variety; after all if everything is corn, where is the beef? Even as we study this seminar chickens, even salmon, are being taught to eat corn.

Question #4. What is nutritionism? What can I do to eat and shop better? How can I get started ?

In 1977, the Senate Select Committee on Nutrition and Human Needs met under the chairmanship of the then South Dakota Senator George McGovern. The mandate of this committee was to eliminate malnutrition. Surely a worthwhile endeavor. The committee was meeting in response to reports of an alarming increase in chronic diseases linked to diet, including heart disease, cancer, obesity, and diabetes. There were two days of testimony and the committee's staff of lawyers and journalists composed a document entitled Dietary Goals for the United States. They had every right to believe this would be an uncontroversial document.

What they had learned was rates of coronary heart disease had soared following World War II, that cultures consuming diets of mostly plants had strikingly low rates of chronic diseases, and that during World War II, when meat and dairy products were strictly rationed in America, the rate of heart disease had temporarily plummeted. In January of 1977 the committee issued guidelines calling for Americans to cut down on consumption of red meat and dairy products.

What they forgot, among other things, was that Senator McGovern was from South Dakota and had many cattle ranchers among his constituents. Within a short time there was a hailstorm of criticism coming mostly from the meat and dairy industries. The committee beat a hasty retreat. Plain talk about real foodstuffs was quickly rewritten. "Reduce consumption of meat" was replaced with "choose meats, poultry and fish that will reduce saturated fat intake." This change in language from real food to "nutrients" was the beginning of the end of any discussion of whole food. From now on we would talk in terms of nutrients. No matter that in the studies linking dietary fat to cancer, the cancers could have been caused just as easily by more animal consumption or less plant foods. It could have been the animal protein, the dietary cholesterol or just a lack of plant foods. We will never know.

Food is now only a combination of its nutrients and we know surprisingly little about nutrients. We use words like polyunsaturated, cholesterol, monounsaturated, carbohydrate, fiber, polyphenols, amino acids, flavonols, carotenoids, antioxidants, probiotics, and phytochemicals to describe food today. We no longer give credence to the taste or social consequences of food. Of course, there are no huge food lobbies in Washington representing saturated fat, vitamins A or C, or beta-carotene. We speak now of antioxidants in vegetables and fruits rather than the fruit themselves. We no longer speak of broccoli or bananas.

Not to belabor the point but one of the troubling things about nutritionism is that food becomes simply the total of its nutrients, those nutrients we know about anyway. Any distinction between whole foods and processed foods is apt to disappear. It is possible for processed foods to appear healthier for you than whole foods, depending upon their "nutritional" value. Remember margarine. First touted as a cheap substitute for butter, this synthetic, processed food can take on nutrients as they become faddish. In the 1950's margarine had the bad nutrients removed (cholesterol and saturated fats) and replaced with good nutrients (polyunsaturated fats). Later, the scientists added Vitamin D and then Vitamin A. But margarine, being a product of humans, was only as good as the nutritional scientists who manipulated its recipe. And it turns out that the scientists were dead wrong about margarine. The scientific method of making healthy vegetable oil solid at room temperature, by blasting it with hydrogen, produced unhealthy trans fat. These are the fats that we now know are more dangerous than the saturated fats they replaced. So now the trans fats are gone from margarine yet margarine marches on, a processed food that can be anything its makers want it to be.

So what can you do to create a healthier eating pattern? You can make a commitment to eat real food that is grown as locally as you can find, to eat organically produced produce whenever you can, and to eat only pastured animals fed on grass which have been humanely treated. Your world and your health will thank you for it.

You can read the books and the published studies, listed in the bibliography of this paper, so that you are an informed buyer. You can help others to understand the overall importance of this healthy and sustainable way of producing and eating. You can start by eating one meal a week that has been produced organically, locally and humanely.

Start your change slowly. The most important and the easiest change to make is to change to eggs and dairy products which have been produced organically and locally. The eggs will have a beautiful bright yellow orange color yolk rather than the bland pale yellow color of commercial eggs, the yolks will stand up and salute you rather than ooze all over your pan. The dairy products will be much fresher and better for you. A farmer once replied when asked if his hens had access to fresh air and grass “Oh, we have a regular Easter egg hunt every day.”

Try one of the local markets. To find a location and time convenient for you, google - local farmer markets, Houston TX. Urban Harvest’s Bayou City Market (www.urbanharvest.org) founded in 1994, has a mission to develop a network of urban gardens, farms and orchards that inspire and empower people of diverse backgrounds to grow food in the city. These gardeners then sell their surplus at the local farmer’s markets. As of this writing there is a market at T’afia, Monica Pope’s midtown restaurant on Saturday mornings, and on the Rice University campus and at Eastside near Greenway. You live in the fourth largest city in the United States. There will be a market for you.

Eat whole foods, not processed foods. If you cannot pronounce the ingredient list or if you recognize the names of processed corn products found in this paper, then eat something else.

The move to a local, sustainable agriculture is growing every day. Become a part of it and benefit from it.

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Suggested Reading

Grassfed Gazette: the Official Journal of the American Grassfed Association. www.americangrassfed.org Published Quarterly.

Kingsolver, Barbara. *Animal, Vegetable, Miracle: A Year of Food Life*. NY: HarperCollins, 2007. Addresses the issue of industrial and sustainable farming through the story on one family's determination to live one year on food raised in their own neighborhood, grow it themselves, or do without.

Pollan, Michael. *In Defense of Food: An Eater's Manifesto*. Penguin Group (U.S.A.), Inc. 2008. Proposes an alternative way of eating that is informed by traditions and ecology of real well-grown, unprocessed food.

Pollan, Michael. *Omnivore's Dilemma: A Natural History of Four Meals*. NY: Penguin Press, 2007. Discusses the three principal food chains that sustain us today: the industrial, the organic, and the hunter-gatherer. Different as they are, all three food chains are systems for doing more or less the same thing: linking us, through what we eat, to the fertility of the earth and the energy of the sun.

Salatin, Joel. *Salad Bar Beef*. Swoope, VA. Polyface Inc., 1995 with 2007 addendum. Offers a beef production model for farmers who do not want to encourage barren soil, pollution, environmental destruction, or inhuman animal treatment.

Schlosser, Eric. *Fast Food Nation: The Dark Side of the American Meal*. Boston, Houghton Mifflin, 2001. Examines the local and global influence of the U.S. fast food industry including the argument that the centralized purchasing power of the large fast food chains have an unprecedented degree of power over the nation's food supply.

Singer, Peter & Mason, Jim. *The Way We Eat: Why Our Food Choices Matter*. Emmaus, PA: Rodale Press, Inc. 2006. Examines the eating habits of three American families with very different eating habits.

Stockman Grassfarmer: the Grazier's Edge. Since 1947. www.stockmangrassfarmer.com Published Monthly.

* Most cited references have extensive source reference lists.

Published Research Studies

* Grassfed Educational Website: www.csuchico.edu/agr/grassfedbeef
Cooperative project between California State University, Chico College of Agriculture and University of California Cooperative Extension. This website is sponsored in part by the California Food & Fiber Future Grant and the CSU, Chico Agricultural Research Initiative.
Two significant studies:

* Daley, C. A., et al. "Effect of Ration on Lipid Profiles in Beef" California State University, College of Agriculture, University of California Cooperation Extension Service.

Study showed diet significantly altered lipid profiles in beef. Grass diets produced a product lower in

overall SFA (saturated fatty acids), higher in PUFA (polyunsaturated fatty acids) and a more desirable omega 6 to 3 ratio. Grass based rations increased CLA by 50% and omega 3 fatty acids by 40% .

* Health Attribute Literature: Daley, C. A. et al. ‘A Literature Review of the Value-Added Nutrients found in Grass-fed Beef Products, June 2005.

A review of literature to support the enhanced nutrition claim for grass-fed product.

This study summarizes a number of reports showing grass-fed beef products contain elevated concentration of B-carotene (body converts to Vitamin A) and a-tocopherol (Vitamin E), increased levels of omega-3 fatty acids, a more desirable omega-3: omega-6 ratio, and increased levels of conjugated linoleic (CLA), (studies over the past two decades have attributed CLA to reducing carcinogenesis, atherosclerosis, onset of diabetes and fat body mass), all substances reported to have favorable biological effects on human health.

* John Hopkins University. www.jhsph.edu

The Joseph Hopkins Bloomberg School of Public Health is dedicated to the education of a diverse group of research scientists and public health professionals, a process inseparably linked to the discovery and application of new knowledge, and through these activities, to the improvement of health and prevention of disease and disability around the world.

The school was the first of its kind worldwide and is the largest school of public health in the world. In recognition of its place in the field it is awarded 20% of the federal research funds that go to the 39 accredited U.S. schools of public health. It is consistently rated Number 1 by U. S. News and World Report.

Notable research study:

* Horrigan, Leo. “How Sustainable Agricultural can Address the Environment and Human Health Harms of Industrial Agriculture.” Published in Environmental Health Perspectives v.110. #5 May 2002.

Introduces some of the environmental and human health problems inherent in current food production practices (industrial agriculture) and discusses how these systems could be made more sustainable.