

## **A Revolution in Agriculture\***

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*"One of the great liabilities of history is that all too many people find themselves in a great period of social change and yet they fail to develop the new mental attitudes and the new mental outlook that the new situation demands. All too many people end up sleeping through a revolution." -- Martin Luther King, Jr., Grinnell College (Iowa), October 1967*

A revolution in agriculture has been quietly taking place, and neither rural nor urban citizens may like the changes it will bring to our food and farming system, or to our landscapes.

But if rallied in time, these same citizens and consumers may ensure the success of a second revolution that has been less well-recognized, but that could help sustain rural communities and assure our access to healthful food.

We have, of course, all known that significant changes have been taking place in agriculture for at least a century. Mom and pop stores have been replaced by supermarkets and super-stores stocked with miles of food procured from every corner of the planet. We now spend less of our earned income on food than any other nation on earth. Farms have gotten larger and more "efficient." While one farmer used to feed only himself and three other people, each farmer now feeds well over 100 people.

All of this led most of us to support the changes that have taken place in agriculture without question. Even farmers whose livelihoods have been destroyed as a result of these changes have largely accepted them as inevitable and somehow serving a greater good.

Until recently, however, most of us have been unaware of the regrettable consequences attending those changes. We were not aware that the technology driving the new food system was quietly dumping nitrates into the planet's water systems at rates that have now caused 50 "dead zones," including a seven thousand square mile zone in the Gulf of Mexico.

We were not aware that the uniformity demanded by our industrial food system had so reduced the genetic diversity of the plant and animal life on which our food system depends that they have become extremely vulnerable to disease. Ninety percent of all commercially produced turkeys in the world, for example, now come from just three breeding flocks. While this produces a uniform product, the birds' compromised immune systems require extensive antibiotics.

Even more troubling, perhaps, is the fact that the structure of our food and farming system is now changing in ways that may challenge values many of us in rural and urban communities hold dear. At the same time, these structural changes are preventing us from obtaining exactly those foods we desire to feed our families.

Farms, and food markets, are no longer simply getting larger, they are becoming concentrated. Bill Heffernan, retired rural sociologist at the University of Missouri, predicts that **in the very near future our entire global retail food system will be in the hands of just five or six firms, perhaps only one of them an American firm - Wal Mart.**

Such concentration is forcing processors, manufacturers and seed suppliers to concentrate even further to supply the retail giants with mass-produced, uniform supplies at low margins. Farms, in turn, will continue to consolidate to produce the essential raw materials in specialized, uniform, mass quantities, at further reduced costs.

The share of each dollar spent that is received by the farmer-which dropped from 44% in 1910 to 9% in 1990 - will continue to drop. Meanwhile the percentage consumed by marketing - which rose from 44% to 67% during that same period - is likely to continue increasing.

All of this would have profound effects on the American landscape. For example, in the past 20 years, the average number of hogs per farm with swine in Iowa soared from just over 200 to over 1200. Now it is estimated that Iowa farms may have to consolidate into 225,000-acre industrial complexes to gain access to markets.

Such "farms" would, of course, buy their equipment and supplies directly from factories instead of local dealers. They would deliver their commodities directly to the firms with which they contract, instead of local grain elevators and packing plants. These firms will determine the management decisions on the "farms" with which they contract. These changes would have a profound effect on both rural and urban communities. The Center for Rural Affairs has estimated that "...with the loss of each farmer there is an economic loss to a rural community of \$720,000 due to all of the associated business supported by farm activity." So if these changes continue apace, rural communities would be devoid of any agriculturally-related economic wealth.

Conservation practices, such as riparian buffer strips, shelterbelts and terraces would disappear to make way for the largest possible farm equipment. Recreational areas, habitat for wildlife and wildlife corridors would give way to miles and miles of continuous cropping. Animal factories would become even more concentrated. Environmental standards desired by local residents would be imposed through regulation, if at all. Meanwhile, a few isolated parts of rural America, especially places that abound in remote scenic beauty, would likely become playgrounds for an elite few.

In an age of social unrest, these highly concentrated food systems pose another risk. As many security experts and ecologists have pointed out, large, concentrated enterprises, with long supply chains are much more vulnerable to terrorist attacks than decentralized, local systems.

### **The second revolution**

But another food and farming future is not only possible, it is increasingly likely. The rapid development of farmers markets, direct markets, and markets for organically produced foods, all point to changes in the market place that have the potential to develop a new food and farming future. **A growing segment of the consuming public is signaling that they want to know where their food comes from, how it was produced, how the animals were treated, and whether or not the food was produced using good environmental stewardship.**

As our awareness of food-borne illnesses and diet-related diseases, and their relationship to our industrial food processes becomes part of the public consciousness, food shoppers will increasingly look for opportunities to form relationships with farmers with whom they can have conversations about the food they eat. This is part of a larger trend toward the "experience economy" in which relationships are key.

New technologies make it possible for independent, moderate-sized farmers, linked with local processors to establish such relationships and thereby gain a competitive advantage with consolidated firms. Here are some examples of how it can work:

- A consumer interested in bison meat can take a virtual tour of the Heartland Bison Ranch in Mandan, North Dakota. While there, you can "Lease a Piece of the Legend" and adopt a buffalo, after which you will be sent regular updates on your buffalo cow and her calf. This sets the stage for your purchase of Buffalo Nickel Bison meat products, which are certified hormone- and antibiotic-free, are raised only on grass and hay, and have one-third less fat and less cholesterol than chicken. Answers to any questions are only an e-mail or phone call away.
- Similarly, at [organicvalley.com](http://organicvalley.com), one can see photographs and read about both the farm animals and the farmers who care for them as part of The Organic Valley Family of Farms, the largest organic farmer-owned cooperative in America. Kids can take a virtual farm tour through the Farm

Friends Kids Club. In many ways - including information on upcoming "on the farm" events - the site seeks to "foster a connection between farm families and their urban dwelling neighbors." And of course, you can identify the stores nearest you that sell Organic Valley dairy, meat and other products.

**At the same time, some farmers are developing production strategies that evolve out of an ecological, rather than a technological, paradigm - one in which natural systems contribute to production.** A leading example is the integrated duck/rice system developed by Takao Furuno, a farmer in southern Japan.

Standard rice production now is a monoculture, dependent on fertilizers and pesticides. Mr. Furuno recalled having seen ducks in rice paddies, and began putting a gaggle of young ducklings into his newly planted paddies. He found that they eat azolla, normally considered a "paddy weed," but a plant which also fixes nitrogen, thus fertilizing the rice. He then introduced loaches, a fish that is delicious to eat.

The fish and the ducks eat the azolla, keeping it under control. The nitrogen from the azolla, plus the droppings from the ducks and fish, provides all of the nutrients needed for the rice. His rice yields exceed those of industrial rice systems by 20 to 50 per cent. He rotates his integrated rice/duck crop with a crop of vegetables and wheat, and grows figs on the periphery of the paddies. Mr. Furuno harvests duck eggs that he markets with the rice, fish and duck meat, vegetables, wheat and figs. His 6-acre farm is among the most productive in the world and he believes that his gross income slightly exceeds that of a typical 600-acre rice farm in Texas.

Many believe this system can make a major contribution to solving the problem of producing adequate, well-balanced diets in some of the world's regions of rapidly growing population. Others are exploring how to develop ecological equivalents in the U.S.

These are the growing markets of the future. Food customers will have a say in what their local landscapes look like through the food choices they make. The relationships they create in their quest for more healthful food will also lead to increased awareness of the other public goods provided by these farmers: properly managed soils help filter water and improve water quality; properly managed landscapes provide habitat for wildlife, helping to restore biodiversity and provide recreational space for hunting and fishing. This awareness will make it easier to rally citizens behind the policy changes needed to support these farmers.

**So it turns out that there are two revolutions in agriculture currently taking place. The kind of food system we have in the future will depend on which revolution we choose.**

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