

Agricultural Industrialization: David versus Goliath Karen Mundy and Wayne Purcell

What is Industrialized Agriculture?

“Who will own and control U.S. agriculture?” asks Harold Breimeyer. “I interpret the industrialization of agriculture primarily in terms of organizational structure—who will own and control. I have said that the major forces for change have arisen outside agriculture and are not to be attributed to poor performance by traditional agriculture . . .” (Breimeyer, p. 1, 5)

In 1990, Thomas Urban said, “Changes in agriculture . . . may require the new use of a very old term to describe the total system—‘industrialization.’” (Urban, p. 4) Urban did not mean that agricultural products such as corn were being used for ethanol or biodegradable plastics. He meant that agriculture has moved away from the traditional family farm structure toward an industrialized model more like automobile factories.

Breimeyer describes two very different ways agriculture can go: traditional family farms and industrialized agriculture. Both types of agriculture have benefits to farm owners and consumers. Both types have costs to farm owners and consumers. We cannot say one is totally good or totally bad. To make informed judgements, we need to understand the social, economic, and policy issues associated with each.

Traditional family farms are often relatively small. They are owned and operated by a family. They may or may not be incorporated, but when they are incorporated, it is done for tax purposes, to insure easy passage of title, and for similar purposes. They buy their inputs and spend their income in their home communities. Much of their hired help is local.

Industrialized farms are very large units often linked by contracts or ownership to large processors. Examples of industrialized farms include large poultry and hog farms, large dairies, large hydroponic greenhouses, and large vegetable operations.

Industrialized farms are often *vertically* or *horizontally integrated*. Vertical integration means one firm controls several steps in the process that gets food from the producer to the retail market. For example, poultry processors (usually called integrators) like Tyson, own the birds, provide the feed, often from their own feedmills, process the birds in their own plants, and finally, market the finished product. Tyson controls the entire journey from the egg to the supermarket. Hog processors are starting to do some of the same things.

Horizontal integration occurs when Hog Farmer A buys Farmers C’s, D’s, and E’s farms, and join them to his own farm. Instead of buying the farms, Farmer A could contract with Farmers C, D, and E. Farmer A tells his farmers what genetics and feed to use, the number of hogs to produce, and when to produce them. Often, Farmer A may also have contracted to provide the hogs to a packer.

Why Is the Industrialization of Agriculture Occurring?

Today, agriculture is increasingly divided into relatively small-scale *commodity producers* and large industrialized farms. Commodity producers frequently have low profits and often respond by selling ever larger quantities in an attempt to improve their income. Grain farmers generally fall into this category. As they get larger, they can reduce their

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production costs and increase their chances of profitability, thus helping them survive. Industrialized farms may have greater profits because they often sell value-added products. They are tied more directly to the consumer in the marketplace, more often producing what today's consumer wants. Consumer demand, not commodity prices, are the focus of the industrialized farm.

Capital flows more easily into industrialized farms because these operations are coordinated and efficient, and they are able to respond more quickly to consumer demands. Investors are attracted to them because industrialized farms can be less risky and more profitable than commodity farms or small-scale family farms that accept high levels of production and price risk while producing low-value, generic commodities. Industrialized farms have advantages in economies of size (by spreading fixed costs over more units of production) and in information and production technology. They also tend to be active in global markets.

The ability to be consumer driven is one of the major reasons industrialization is occurring in agriculture. Relatively small-scale, independent operators in production, processing, distribution, wholesaling, and retailing face problems trying to respond quickly to consumers. Price is supposed to coordinate the separate activities to make sure that the farmers produce what consumers want. But this price-driven system, which relies on information from consumers, has not been very successful in communicating its message. A processing firm that wants to sell to Japan, for example, can be frustrated by the lack of communication, coordination, and quality control in a price-driven system. Vertical integration or contract production may be seen as the only way to achieve the coordination necessary to serve this market.

Industrialization has also been prompted by various policy decisions at all levels of government. In a price-driven system, good economic planning and market information is essential. Yet during the 1990s, some states are totally abandoning their financial support of market information programs. At the national level, the United States Department of Agriculture (USDA) has struggled with budget cuts in its market news programs. Even where the market news activity is supported, other necessary conditions have not always been met. For many years, grades for beef and pork, and increasingly, grains, oilseeds, other foodstuffs, and fibers have not identified characteristics that are of major importance to consumers. When the characteristics that consumers consider important are not identified, a system using price to provide the information cannot respond adequately or rapidly. Yet, the policy adopted by USDA is to wait for agreement among those involved before a change in grading is considered.

Agreement is slow to be reached, if it is reached at all, because any grading change usually results in at least some redistribution of profit across the various sectors involved. If the public sector fails to provide grades that reflect consumers' wants, the private sector will provide its own solutions. Privately developed solutions have progressed rapidly in pork and are beginning to be seen in beef.

What Are the Advantages of Industrialized Agriculture?

Industrialized agriculture uses manufacturing principles to its advantage (Boehlje, p. 1). As scientists find ways to control biological production, the scheduling of processing becomes easier because production and processing can be coordinated. This coordination allows processing facilities to operate near or at capacity. Tasks become systematized and more programmable. Schedules are more easily established and maintained. The end result is reduced costs.

Poultry and pork are following the manufacturing principle that places an increased emphasis on the entire production chain from raw materials through final product. Part of the change for these industries was the need to provide their own solutions to problems like grading that the public sector was not addressing. Beef, on the other hand, continues to rely primarily on a system of grades to categorize quality for consumers. This grading system has not been changed in years, but consumers' tastes and preferences for what they perceive as quality have changed. Price-driven markets have failed to send the message of quality, consistency, and convenience that consumers want in beef products. With integration or contract production, the information from the consumer reaches the producer directly and more quickly. As changes are made to reflect the changing consumer demands, producers and processors, who use contracts or who are vertically integrated, often reduce their losses and enhance their profit potentials.

Specialization in production is also occurring in industrialized agriculture. Swine farrowing units are separated from finishing units; replacement heifers for dairy herds are being raised by another farmer or by someone else on the same farm; feed for poultry or hogs or dairy is raised by yet another producer. As this specialization occurs, economies of size result. Specialization allows one person to become extremely knowledgeable and proficient in one area, which helps him/her solve problems more quickly, again reducing costs.

Information flows are crucial to the survival of any business. To the extent that a business is able to obtain

information and incorporate that information into its production before other businesses are able to do likewise, the first business has an unquestionable advantage. Industrialized farms are able to generate planning and pricing information from internal sources. Since this information is proprietary, it does not need to be shared, and it allows businesses to increase profits and influence technological and institutional change (Boehlje, pp.1-5).

What Are the Costs of Industrialized Agriculture?

Many economists and rural sociologists writing about industrialized agriculture focus on its costs. These researchers list environmental, economic, and social health of communities as major issues. Some environmental issues relate to the size of the industrialized farms. These farms tend to concentrate large numbers of animals in one place. Waste from these animals is handled in lagoons or as litter. At some point, the waste needs to be removed. The usual method of disposal is applying it to the land. Because many of these operations produce little of their own feed, adequate land and crops are not always available to make use of the nutrients found in livestock and poultry waste. If the land base is inadequate or if waste-management programs are not well designed and well managed, water quality and safety become a concern. Odor is often a complaint from neighbors when the waste is spread on fields.

The economic and social health of communities are closely related. The industrialized farms replace labor with capital-intensive technology. They often negotiate contracts for inputs with nonlocal suppliers. Local suppliers may be forced out of business. Small-scale producers, having no local supplier for their inputs, are forced to go elsewhere, often at higher costs, which can force them out of business. These business closings put people out of work. The industrialized farms may hire some of these people. Local cash markets often struggle because they cannot achieve the necessary coordination that contracts provide. If small-scale, independent farmers want to sell their products, they may find the local cash markets have disappeared. Processors may not want to purchase their products either, especially when the products do not fit the processors' marketing program requirements. These changes affect the local economy.

Not all industrialized farms have their headquarters in the community where they do business. When they do not, money leaves the community. When inputs are purchased from nonlocal suppliers, money leaves the community. The result is that the local community can suffer from lost income. Because many consumers base their buying decisions

primarily on price, not taste or quality, they are supporting this behavior.

The time needed for the marketplace to provide the necessary information about consumers' choices can allow large, irreversible trends in the structure of communities to occur.

In the course of standardizing production, variety and quality may be sacrificed. Efficient tomato production and harvesting resulted from the development of tomatoes that could be harvested mechanically. Many people believe a loss of quality also resulted. If more labor-intensive operations producing a different quality tomato cannot compete, consumers lose variety and their opportunity to choose. Any agricultural commodity where industrialized agriculture replaces the more labor-intensive and diverse production that offers more variety may face similar results. The marketplace may achieve the combination of price and quality that consumers want, but it could take a long time.

Apart from the specific infrastructure needed for agricultural industries, community infrastructure could potentially be affected. If the industrialized farms ask to use local sewer treatment for their waste, the local system needs to be large enough to handle that waste. Roads are another local infrastructure that may need to be considered as large vehicles serving the industrialized farms become more frequent users.

No one can really say that one management style is always superior to another. However, as independent entrepreneurs trade their independence to become contract growers, perhaps for financial security, the social fabric of a community changes. How it changes and if this change is good for the community can only be evaluated based on the goals of the community.

Any problems or costs associated with large, industrialized farms are not insurmountable, but they must be addressed if consumers are to continue to enjoy the benefits of inexpensive, readily available food. To get to the combination of price, quality, variety, and convenience consumers want can take time if price is the source of information. And it can prove to be costly because of the uncertainty created as the marketplace and the social fabric of rural communities change. By the time people in the community agree that what is happening is contrary to what they want, it may be too late to reverse the trend.

"Inconsistent programs at different levels of government serve no constructive purpose." (Castle, p. 24)

What Are the Policy Issues for Federal, State, and Local Governments?

Three basic policy alternatives exist to deal with industrialized agriculture: do nothing and rely on existing policies for marketing, environmental protection, and market regulation or anti-trust issues; stop any further industrialization by legislative action; or develop policies that address problems as they begin to arise. If the first alternative is chosen, the industrialization of agriculture will continue. Smaller-scale farmers operating as entrepreneurs and decision-makers will continue to disappear. The second alternative is neither suitable nor feasible. Only by deliberately developing consistent policies at the federal, state, and local levels will we create outcomes that are acceptable to industrialized farm owners, consumers, and local communities alike and that give more traditional price-driven systems a chance to compete and succeed.

Many tradeoffs are associated with an industrialized agricultural system. Will we recognize and discuss all the tradeoffs and properly integrate the responses into our policies?

Drabenstatt raises the issue of whether the federal government should try to save the traditional family farm. Will saving these farms benefit consumers and at what cost? Are consumers the only ones to be considered? Is the government's lack of support for the collection and dissemination of price and market information and its lack of responsiveness in areas such as grading and inspection putting small-scale farmers at a disadvantage? What is the role of public research if the industrialized farms do their own research? Is it appropriate to spend tax dollars on research and data collection to provide information to small-scale farmers so that they have a more level playing field with the industrialized farms that can afford to conduct their own research and collect their own information? Do we, the public, recognize that failure to support research and market information collection and dissemination is aiding the industrialization of our food and fiber systems?

A public good is something everyone has access to and can use without interfering with another person. At the national level, activities such as grading and collecting and disseminating market news are public goods. Integrated firms seldom use existing public grading services. As their quality

control programs become internalized and proprietary, they bypass the use of the publicly provided service, thus decreasing its value as a public good. Legislation, assuming a public good is valuable, could protect that public good.

At the state level, recent Right-to-Farm Legislation in Virginia requires localities to develop zoning ordinances to protect producers from nuisance complaints from their neighbors. The same legislation made it illegal for localities to require special use permits for an agricultural operation located in an area zoned for agriculture. The General Permits for Confined Animal Feeding Operations (Virginia Code 62.1-44.17.1) required that confined animal feeding operations have nutrient management plans. As of January 1999, legislation has been proposed to include poultry as well as hogs and cattle under the General Permit requirement for nutrient management plans.

While the Right-to-Farm Legislation required localities to develop zoning ordinances, it did not specify what these ordinances should look like. Each county creates its own unique zoning policies and related ordinances. Designating agriculture as an industry gives the locality a way to segregate agriculture, manage it, and protect it because few people consider turning industrially zoned land into houses. To call agriculture an industry and zone it as such does mean that a locality might also be seen as encouraging industrialized agriculture as opposed to small-scale, independent farms. Counties write their zoning ordinances to specify setback requirements that encourage or restrict the expansion of existing operations or the entry of new ones (Piepenhagen and Kenyon).

A locality must also consider its local resources as it develops policies. How a farm, for example, handles its waste is an important issue. Will it be allowed to dump into the local sewer system? Who should pay to improve or expand the sewer system if farms are allowed to use them for waste disposal? The size of vehicles the industrialized farms need to handle their inputs and outputs may exceed the capacity of local road systems. Who is responsible to pay for their maintenance and improvement?

One of the problems rural areas face is coping with state policies that conflict with local values. These conflicts are not unique to agriculture. Cox and Alwang, and Bailey and Johnson address these conflicts in separate discussions of economic development incentives. Policy at any level must have as its goals to ensure the environment--air, water, and land--will remain livable and to ensure local communities will remain viable--that local people will not be forced out of business. The other side of that coin is that local policies need to reflect an understanding of federal and state policies.

If industrialized farms have benefits to society as a whole, ways must be found for them to support communities and to provide increased opportunities within those communities.

Industrialized agriculture has social and economic benefits that small-scale farms cannot offer. Industrialized farms can also have costs that can change the social and economic fiber of our country, state, and community. To the extent that the social benefits are enhanced and the social costs minimized, industrialized farms will help America keep its position as the "breadbasket of the world." To the extent that the social costs are ignored because many consumers "vote their pocketbooks" and look for low-cost food, America has the potential to become dependent on other countries for some of its food and to see food choices and variety diminish. The public good in this process is keeping the public wellbeing, which may or may not be protected by private initiatives, in mind.

As we watch the face of rural America change, it behooves us to step back and ask why, who is being helped, who is being hurt, and what policies we ought to be considering at all levels to protect the wellbeing of the public at large. If we do not pay attention, the industrialization will continue, small-scale farmers will continue to disappear, and the social fabric of our rural communities will change. Without public input and policy based on that input, the change may not be what people living in our rural communities want.

References

- Boehlje, Michael. "Industrialization of Agriculture: Implications for the Dairy Industry." Paper presented at 1997 Mid-Atlantic Dairy Conference. <http://www-das.cas.psu.edu/dairymap/publications/dadmc97/paper3.htm>. Accessed Feb. 2, 1999.
- Breimyer, Harold F. "The Forces Driving Agricultural Industrialization." Paper presented at The Industrialization of Agriculture, The Breimyer Seminar on Agricultural Policy. (Columbia: Missouri) Nov. 16-17, 1995.
- Castle, Emory N. *Agricultural Industrialization in the American Countryside*. Henry Wallace Institute for Alternative Agriculture. <http://www.hawiaa.org/psp.htm#pspr11>. Accessed Dec. 12, 1998.
- Drabenstott, Mark. "Industrialization: Steady Current or Tidal Wave?" *Choices*, Fourth Quarter, 1994, pp. 4-8.
- Hurt, Chris. "Industrialization in the Pork Industry," *Choices*, Fourth Quarter, 1994, pp. 9-13.

- Kenyon, David. *Developing Permits: A Virginia Case Study for Confined Animal Feeding Operations*. Va. Coop. Ext. Pub. No 448/225 REAP R027, Jan. 1997.
- Peipenhagen, Katryne and David Kenyon. *The Right-to-Farm Legislation and County Zoning Ordinances*. Va. Coop. Ext. Pub. No 448-224/REAP R026, Sept. 1996.
- Rhodes, V. James. "The Industrialization of Hog Production," *Review of Agricultural Economics*. 17(May 1995):107-118.
- Saxowsky, David M. and Marvin R. Duncan. *Understanding Agriculture's Transition into the 21st Century: Challenges, Opportunities, Consequences and Alternatives*. Ag. Econ. Misc. Report No. 181. NDSU, March 1998.
- Urban, Thomas. "Agricultural Industrialization: It's Inevitable," *Choices*, Fourth Quarter 1994, pp.4-6.

NOTICES

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