Staff Paper

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This process of Creative Destruction is the essential fact about capitalism.... It is not [price] competition which counts but the ... competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.

-- Joseph A. Schumpeter, 1947.

What innovations will command the decisive cost or quality advantages that U.S. agricultural businesses will need for survival in the next century? What strategies can generate these innovations? Several discernable trends in the agricultural economy offer inklings of how strategies and innovations may evolve. Taking the perspective that where there is change, there is opportunity, we proceed to offer some recommendations for agribusinesses facing the 21st Century.

Evolving population drives economic trends

Demographics will be the key agent transforming the operating environment for U.S. agricultural businesses. A population growing in size and diversity will place new limits on how food and fiber can be produced, while at the same time requiring more of both in greater variety. The issue takes several distinct forms.

Population growth causes the natural resource base per person to become scarcer. Growing demand for industrial, commercial and residential land raises the price of agricultural land and the opportunity cost of farming. The growing interface between farmers and nonfarmers on the expanding metropolitan fringe puts agricultural practices under greater scrutiny. "Right-to-farm" laws in many states aim to protect farm land from being zoned non-agricultural. But they also define acceptable farming practices which limit management options.

Growing demand for clean air and water translates into increasing regulation of practices that may pollute. Obtaining cleaner water implies more stringent controls on agricultural chemicals that leach into groundwater (pesticides and nitrate fertilizers) or run off into surface water (phosphate-laden manures and fertilizers), as well as erosive soil tillage practices that both contaminate surface water and undermine productivity.

Agricultural impacts on air quality are only beginning to come under scrutiny. Where rural areas are becoming suburban, odor from livestock manure and spray drift from crop production become local issues. But global concerns will not be far behind. Even the benign dairy cow has come under attack in the Netherlands for the ammonia she produces, due to its suspected link with acid rain.

American households continue to grow more prosperous. But to accomplish this despite stagnant real personal incomes, more people per household have joined the paid work force. Higher household income raises demand for such income-elastic goods as varied diets and wardrobes, good health, and what could be termed "ethical consumption." An increasingly diverse population reinforces the demands for diets and clothes that offer rich choices both in composition and in form. Health concerns are already limiting the market for foods perceived to contain chemical residues or unhealthful ingredients. They may begin to have a similar effect on fibers. Food safety concerns are also fueling pressure for more detailed content labelling. Heretofore, animal treatment has been a significant market factor only for furs. But benevolent animal husbandry is becoming a new attribute that some consumers will seek in meat, dairy, and possibly textile products.

Somewhat at odds with these trends is the greater convenience demanded by busier consumers. Households are turning to more quickly-prepared foods and less often sitting down together to enjoy a family meal. Consequently, demand is growing for individually-packaged and fast-food meals, both at home and in restaurants. Will the trends toward, say, more low-cholesterol and microwavable foods continue into the 21st century? Certainly not at current rates. What will continue are the underlying trends toward consumption that is perceived to be healthful, varied and ethical, in a environment that will provide more and more information about these attributes.

Population change not only affects how farm products can be produced and marketed; it is also changing the nature of the American farm itself. Part-time farming is spreading as expanding metropolitan areas make salaried jobs available to farmers and farms available to salaried employees. Many part-time farmers love farming, but they have limited time for the work it requires. Large, multi-operator farms are also growing in number. Management poses a key challenge for these operations. As farms get larger, they get more complicated to manage, yet the financial barrier to entry gets ever higher for aspiring young farmers. The seeds for change are already in the wind. American agriculture can expect to see increasing separation of ownership and management in the larger operations. While this may accelerate the transformation of the family farm, it will also bring to farming a fresh cadre of managers, many of them specialists in production, marketing or finance.

Technological and regulatory framework

The demographic climate is evolving against a backdrop of technological and regulatory changes. These constitute the framework within which agricultural business can respond. Advances in genetic engineering have created powerful incentives for private-sector involvement in agricultural research. The emerging response is an explosion of plant and animal varieties with attributes that cut production costs, cut processing costs, or add desired marketing qualities. Examples include herbicide-tolerant crops, cereals high in protein or flour content, lean hogs, and vegetable oils low in saturated fats.

The regulatory setting will be one of reduced income supports and increased environmental and food safety restrictions. In the short run, reduced farm income supports are motivated by the federal budget deficit. But evolving economic research into incentive structures and the accelerating global decline in government intervention in agriculture spells a sustained trend. The 1985 and 1990 farm bills brought declines in real farm incomes through target prices that fell in real terms and base yields that stayed fixed. Milk price supports have plummeted. Reconciling farm politics with budget constraints is leading to government policies that return more flexibility to farm managers in choosing **what** to produce. But the same political calculus on environmental issues is leading to policies that curtail flexibility in choosing **how** to produce.

Heightened competition is in prospect for international agricultural commodity markets. If the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) is approved and ratified, trade liberalization will lead to higher world commodity prices in the short run. Those higher prices will elicit a supply response which will make long-run commodity returns to U.S. producers no better than today's. After several years of adjustment, Russia, Ukraine and eastern Europe can be expected to increase dramatically their grain output. South American oilseed production will remain strong. These effects will more than counterbalance any decline in European Community output resulting from reduced Common Agricultural Policy price supports. On the demand side, improving incomes in East Asia and the former Soviet bloc countries will likely boost world prices for meat and dairy products, as well as specialty fruits and vegetables. However, some of the ex-Soviet bloc nations will eventually present serious competition in livestock production. Environmental regulations at home will place U.S. commodity producers in a cost squeeze against this backdrop of stabilizing world prices. In the final analysis, the immediate gains of trade liberalization will be offset by lower commodity returns as global competition intensifies. If GATT should fail, this outcome will be hastened under the alternative scenario of free trade blocs, such as the EC and the North American Free Trade Association.

Falling commodity returns. Proliferating environmental regulations. More complicated technologies. Pickier consumers. The general outlook is for an economic environment that puts greatly increased demands on agribusiness management. It's a sow's ear. What can be done with it?

Emergent Opportunities

For all agribusiness firms, be they input suppliers, producers, or processors, the first step toward the future is adopting a strategic frame of mind: The silk purse must be envisioned. The changes suggested above are not likely to be avoided by any firm. Therefore, dwelling on potential threats to established, comfortable business practices will only be counterproductive. The trends contain inherent opportunities, and these opportunities must be seized to promote future agribusiness vitality.

Start with the pickier consumer. Where there are strong preferences, there are opportunities to differentiate product offerings profitably. Products which can assure consumers of their quality--nutritionally, environmentally, and ethically--will command a premium in the market. Low chemical foods, "humanely raised" meat products, and "healthful" foods are all examples. Pioneer's Better-Life™ grains, with their certification of pesticide-free production (Urban), is a specific business strategy designed to take advantage of the opportunities in current trends. Even such a traditional commodity as cotton can now be grown in natural colors thus reducing the need for the expense and toxicity of dyes in clothing manufacturing.

But providing assurance of special qualities throughout the food and fiber chain will demand different managerial perspectives from the past. Producers need to look beyond production to marketing, taking an interest in consumer demands and tailoring the production process to meet these demands. Input suppliers too must be driven by more than producers' needs. They must understand the impact that each input has on the final quality of the products moving to market. Even though many value-added processors already exist in the food chain, the commodity processors will need to alter their focus to handle products in ways which contribute to quality and consumer-market differentiation.

The various agribusinesses in the food chain can hardly hope to produce needed quality differentiation through individual, stand-alone efforts. Producers, input suppliers, handlers, and processors will have to align with each other to establish an unbroken chain of quality from the generic base to the food table. Yes, total quality management as seen in the Deming method, or so-called Japanese management, must come to agribusiness as it has come to so many other American firms in the last several years.

But are agribusinesses prepared for such management practices? Total quality management is more than just traditional product quality control; it is a frame of mind focused on the relentless pursuit of improved quality in every facet of a firm's operations, including (but not limited to) product manufacturing, marketing, and customer service. Total quality reaches beyond the firm itself to include suppliers, since their inputs bear heavily on final quality. The consumer must also be viewed as an integral part of the production process. As W. Edwards Deming exhorts managers (Walton, p. 29),

> "Improve [material] that comes in, adapt it, provide more and more what the customer needs. That requires cooperation, working together. And continual change, as requirements change. And they will change. In a continual cycle."

This is a far cry from the commodity mentality and strategies which have historically driven agribusiness operations.

The vertical alliances required to meet changing consumer needs do imply a loss of independence for individual agribusiness firms. It is tempting to see only this loss. But firms must counterbalance this threat with the potentially large payoffs from differentiation. For example, falling commodity returns can be less damaging for producers if their output is no longer a commodity in the strictest sense. The introduction of complicated technologies in physical production, biological reproduction, and management practice can actually enhance differentiation and be supported throughout the market chain through the mutual cooperation of interdependent trading partners. The burden of high conversion costs need not be borne by one set of actors who are isolated in the chain and end up facing inadequate returns. In addition, competition from foreign producers who have only a commodity infrastructure will be far less threatening if we are producing varied, value-added products. The interdependence necessary for quality also substantially lessens the incentive for actors to take advantage of one another. Trust is critical to quality assurance and continual improvement.

If differentiation is a broad opportunity which promises to link the food system more closely than ever before, there are also many narrower opportunities open to various segments of agribusiness.

Producers can generate value-added on their own. The best of the fruit and vegetable producers have found this to be true as they create "entertainment" for city dwellers at their roadside markets. The sight of a cider mill in operation, hay rides in the orchard, and country and western bands playing for the customers all enhance the basic products on sale.

Certification of quality represents an opportunity for product testing firms. Legitimately skeptical consumers will demand more than the simple promises found in advertising slogans or trendy product names. Invisible attributes will need to be certified, creating demand for procedures that do so reliably and at reasonable cost.

As environmental regulations evolve in concert with the refinement of sustainable agricultural methods, a diverse mix of business opportunities will materialize. Livestock waste disposal regulations will create demand for the breeding of waste-digestion organisms and marketing services for manure products. Record-keeping services will be needed to account for nutrient and chemical flows, as well as plant and animal health. Ecosystem-based farm management will call for more comprehensive scouting services and computer models to track the state of the agroecosystem and forecast its evolution under alternative management tactics. More custom services will be needed to apply hazardous chemicals and meet the special needs of part-time producers. Current agricultural input suppliers should be carefully studying the marketplace to determine which of these services and products they should add to their other lines of business.

Agricultural manufacturers also face new opportunities. Equipment manufacturers have opportunities to produce "smart" fertilizer and herbicide applicators, composting equipment, and computerized environmental controls for livestock. Chemical manufacturers will find opportunities to make fertilizers and pesticides that "mix-on-the-go," allowing rates tailored to need and safer disposal of leftover chemicals.

From both environmental and product-differentiation perspectives, genetic engineering firms have dramatic opportunities and challenges ahead. In crops, demand exists for herbicide tolerance, greater disease and pest resistance, weed smothering properties, and output characteristics that promote efficient processing into differentiated final products. Engineering for low-fat breeds of livestock and biological pest controls are also promising areas. The key challenge is to meet these needs while insuring negligible ill effects from releasing engineered genotypes.

The confluence of environmental and product-differentiation trends will require all segments of the food system to become more sophisticated managerially. The blanket application of fertilizers and pesticides and the historic lack of strict production controls must give way to tailored applications and documented production procedures based on specific information about a field, a crop, an animal, or a herd. This opens up opportunities for information systems designed to support agricultural management at the input supplier, producer, and processor levels.

All the opportunities mentioned above are more than domestic; they are international as well. As tariff barriers fall, the strategic skills developed to serve pickier domestic consumers can be applied equally well to marketing value-added products which appeal to international market niches. Alliances among input, producer, and processor firms must be augmented with marketing and trading firms to assure the full mix of resources necessary for successful global trade. All U.S. agribusiness players should become more familiar with general trade policy and with the procedural intricacy and cultural sensitivity needed to forge specific trade strategies. In doing this, U.S. firms must remain focused on moving our products out to the world rather than protecting the home market through new non-tariff trade barriers.

There will be needs for many management consulting services to help agribusinesses implement and manage new technologies, services, and products. Market research, international trade development, financial and strategic planning, production process analysis, personnel and supervisory training, statistical process controls, and system engineering design/layout are some of the many consulting examples which could be cited. Even (alas!), more lawyers will be needed to help forge the contractual relationships among partners in the differentiated product chain.

The managerial complexity of the new agriculture also opens up doors for the "business" of education. Agriculture undergraduates must be prepared for the management environment they will face in agribusinesses, including management of technology, team building in a contractually integrated food system, and decision making in an information-intensive field. More specialized graduate degrees, e.g., MBA in agribusiness, may be needed as the system evolves, becomes more complex, and matures. Continuing education for managers already in agribusiness will be essential to the maintenance of competitive advantage.

The Future is Bright, But . . .

The sow's ear of falling commodity returns, proliferating environmental regulations, more complicated technologies, and pickier consumers can become the silk purse of quality product differentiation and improved management practice, but the transformation will not be

easy. While Schumpeter may revel in the process of "creative destruction," real managers and employees will face unprecedented changes which will be threatening. As new firms, new products, and new services emerge, old ones will pass away. Product differentiation and management intensity will demand new talents from agribusinesses. We must avoid the temptation to maintain artificially the old food system and focus instead on preparing for the new. The opportunities are many, but we must see them as opportunities and take concrete steps to capture their potential.

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