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Politics and Markets in the Articulation of Preferences for Attributes of the Rapidly Changing Food and Agricultural Sectors: Framing the Issues

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ABSTRACT

Industrialization of the food and agricultural sectors changes the pattern of external effects. Participants helped or harmed in the process attempt to influence outcomes through markets and politics. Decisions about property rights and boundaries determine benefits and burdens and the relative cost of animal agriculture in different jurisdictions. Prescriptions to redefine property rights are influenced by selective perception of rights to share in the benefits and be protected from costs. Political choices about the appropriate jurisdiction (state versus local) for addressing environmental and nuisance effects of animal agriculture affect whose preferences count and will influence the development of these sectors.

Key Words: animal agriculture, environment, externalities, industrialization, institutions, jurisdictional boundaries, regulation, state versus local policy.

The industrialization of the U.S. food and agricultural sectors is bringing about significant change and giving rise to many concerns among food system participants, rural citizens, and public policy makers. In animal agriculture, the concentration of animals on fewer, larger farms and increased vertical integration, contracting, and joint ventures are changing the structure of farming and creating community and regional conflicts. Smaller farms are losing their position relative to larger ones, and the locus of decisions is shifting from farm to off-farm organizations. Larger animal production units are increasingly leading to conflicts between producers and neighbors, and communities are faced with many actual and potential environmental or nuisance threats (Hallberg, Abdalla, and Thompson). Some groups are concerned about the impact of industrialization upon the conditions or earnings of workers, while others are interested in social and community issues resulting from changes in farm ownership and workforce. Still other groups worry about the nutritional value or safety of food supplied through an industrialized system. At the same time, many of these groups benefit as consumers from the competition for profits potentially available from reducing production costs that drives the industrialization process.

Industrialization involves economic reor-

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ganization with specialization in work and trade including introduction of new technology that advances the productive output of the food and agricultural sectors. This process also results in major changes in the pattern of external effects, creating benefits for some and burdens for others. The changing interdependencies brought about by industrialization cause many existing institutions to become inadequate or obsolete. New and innovative institutional arrangements are needed to articulate preferences and to coordinate economic activities to better meet societal goals (Shaffer 1969).

Adjustment to industrialization is an evolutionary process. Economists can assist by promoting an understanding of the political and economic forces at work and conducting analyses of policy issues and choices. In this paper, we discuss two important emerging issues in animal agriculture. We first address how policy prescriptions to redefine property rights (broadly defined) are influenced by selective perceptions about rights to share in the benefits and to be protected from costs resulting from industrialization. Second, we highlight the critical role that jurisdictional boundaries play in influencing the political articulation of preferences about the external effects of industrialized animal production. Our focus in this discussion is upon the implications of state versus local decision making with regard to environmental and associated nuisance issues. Differences in states' institutional rules affect whose preferences count in making decisions about rights and costs. Since decisions about property rights and boundaries influence the degree to which such costs are born by participants, they affect the costs of doing business and the quality of life in different states. These differences in turn influence the development of animal agriculture in the South as well as other regions (Pagano and Abdalla; Abdalla, Lanyon, and Hallberg). Finally, suggestions for improved analysis of policy issues arising from an increasingly industrialized food and agricultural sector are offered.

An Evolutionary Framework

A simplified three-part framework is proposed as being useful to analysis of food and agricultural sector problems. Our interest is in the interrelationships among *institutions* (informal and formal rules or policies of the economy), *behavior* (responses of different actors in the parts of the economy of interest), and *performance* (the outcomes which people care about). This is an evolutionary framework that emphasizes how the system changes through time and is dynamic in that it allows feedback from one stage to another.

A central theme of economics and the rationale for capitalism is the concept of economic transformation from less productive to more productive systems. This transformation is based upon advantages of specialization in human activity and trade. It is driven by competition leading to profits for the innovators and lower cost producers, resulting in higher average real incomes. Industrialization is the organization of production to take advantage of the increased productivity that results from investing in capital goods. Scientific industrialization is based upon specialization in and investments in knowledge to be used to increase productivity. Differences in the capacity to develop and use knowledge is a critical factor explaining differences in productivity among groups or countries. The industrialization of livestock production rests on recently acquired and applied technical and organizational knowledge. But technical knowledge absent a supporting system of institutions will not produce the potentially available increases in productivity and levels of living (Olson).

Economic performance follows from the combination of technical possibilities and institutions. The increased productivity potentially available from specialization and trade is not possible without institutions to facilitate preference articulation. Thus it is never a question of politics versus markets for guiding production to meet consumer and citizen wants. In capitalism, the question becomes: What are the rules for the market set by political means that will produce desired outcomes? The market alone cannot articulate

preferences for the kind of world we prefer. Analytically, the political problem is to define the rules for determining what is taken into account as cost and, often the reciprocal, the entitlement of participants.

This suggests framing the analysis in terms of understanding changing patterns of costs and entitlement that result from industrialization and predicting the consequences of innovations in rules that influence costs and entitlement. The environmental, nuisance, and other impacts resulting from industrialization of the livestock system can be viewed within this frame. So, too, can predicting the consequences of new rules, such as determining whether industrialized swine production would be profitable if all external costs were imposed upon these enterprises. A question central to the analysis is: What are the appropriate jurisdictional boundaries for determining the costs to be taken into account?

Selective Perception of Property Rights: Defining Entitlement and Costs in a Political Context

Property rights are taken as given by most economists. In policy analysis, the practice is to deal with a particular change in rights and take other rights as given, or to ignore them altogether. Based upon observations by Coase, economists suggest that solutions to some externality problems can be worked out through bargaining to arrive at efficient outcomes, regardless of which party has liability or ownership. This assumes that rights are clearly defined, and thus tradable, and transactions costs are not significant. There are a number of problems with this argument, but the general idea that defining rights and making them tradable has useful applications. Of course, transactions costs are seldom insignificant, and the concept of efficiency is a narrow one—essentially defined as allocating resources to the highest bidder in a competitive market given a certain set of property rights. Note also that property rights must be well defined. This is clearly critical, as seen in the great adjustment problems faced in countries attempting to make the transition from planned to more market-oriented economies. The distribution of wealth (purchasing power), both before and after the bargaining for the resource, is ignored. This is important in evaluating economic performance. Preexisting wealth determines whose preferences are articulated in the highest bids. Ownership does matter in determining who becomes wealthy, and thus who is able to articulate their preferences in the future. Wealth and political power are highly correlated. Clearly the issues cannot be framed simply in the context of efficiency (Samuels).

Defining property rights involves determining what is counted as a cost and by what means participants are entitled to a share of the economic output. Entitlements are rights to charge costs to the system or impose costs on others. In a modern economy, there are many rules that define rights and costs. They have a pervasive influence on the performance of an economy. Individuals and governments selectively perceive the appropriateness of the rules defining costs, and entitlement follows in part from their limited capacity to comprehend and analyze the complex patterns of rules defining costs and to analyze the implications of changing them. We would not choose to live in societies with all of the rules defining costs up for constant review, even if we could comprehend it. Selective perception in regard to rights and costs is also a function of ideology and the structure of power and capacity to influence perceptions. Technological developments and industrialization change the consequences of existing rules of the economic game, creating incentives to change the rules. But perception about what is up for consideration is always highly selective (Shaffer 1989). One of the roles of the economist should be to expand the scope of inquiry. Economists should frame the issues in a context that opens a broader set of options for improving performance than is perceived to be relevant, given prevailing beliefs about the acceptability of the existing system of rights.

There are many problems in articulating preferences for rights that determine costs because the implications of the policy defining the rights are obscure and uncertain. To illustrate, start with the agreement that costs and

benefits are associated with the industrialization of the U.S. livestock system and that they will exist regardless of the rules defining their accounting. Assume the benefits and costs of the particular pattern of production and distribution could be calculated. Benefits would include lower prices of meat, poultry, and dairy products, and higher returns to some workers and resource owners. On the cost side would be suffering from loss of jobs, disruptions in communities both in the new production areas and those abandoned, and air and water pollution. Assume the increased productivity and lower output prices are made possible by a number of technological and organizational innovations and infrastructure investments subsidized in part by taxes from several different jurisdictions. Further assume that manure from a large livestock facility is washed into a river during a flood and ends up in the Gulf of Mexico, and that this event is the "last straw" leading to an additional bloom of the red tide that precipitates suffering by the people on the coast of Florida, losses to the tourist trade, and the deaths of five asthmatic children (because of added problems of breathing due to the fumes of the red tide).

Consider some of these issues with regard to defining the rights determining prices and accounting for costs. Given current knowledge and detection capabilities, tracing the consequences of the water pollution would not be possible. Even with information making the link, the high transactions cost of a legal case for damages would make such a case unlikely. Important property rights in this case include the rules for establishing the burden of proof, the attribution of the damages from the last straw compared with the total contributions to pollution, and the rule that an actor cannot be held accountable for damages which are an act of God (the flood). If the case is taken out of the courts and placed under the purview of a rule-making agency, burdens of proof and the benefit of the doubt rules will influence cost and benefit outcomes.

Particularly interesting and important, but seldom perceived as an issue, are the property rights to the accumulated knowledge about the food and agricultural sector that make the increased productivity possible. Some of the technologies used in animal production might be patented. The rules on patented genetics would create an entitlement and a potential cost to the livestock production and marketing system. If the case could be made that most of the increased productivity in the livestock system is attributable to accumulated knowledge, a logical question becomes: Who owns that knowledge? Suppose the polity decided that half of the productivity increases were due to accumulated knowledge and that the knowledge belonged to the citizens collectively. The owners, as is the case with other inputs, could logically charge for the use of the knowledge. If a "knowledge use fee" were applied in all enterprises, the revenues might eliminate the need for taxes and create a pool of resources to compensate for damages resulting from industrialization of the animal sector.

The basic policy concept from welfare economics is to continue to change the rules of the game as long as someone is made better off and no one is made worse off (Pareto optimality). Since this is nearly an empty box, the concept was modified by some to include the concept that rules would be modified as long as everyone would be better off if the winners could compensate the losers. In reality, of course, it is not practical to identify winners and losers and make the transfers consistent with the goal of leaving all better off.

The above discussion suggests that there are at least two different approaches to framing the issues associated with industrialization of animal agriculture. One is to approach policy by focusing on defining specific property rights, including ownership, based upon ethical or political judgments as to what is just. A modification would be to define property rights in a way that allows them to be marketed where the resource has marketable characteristics. This approach starts with the rules and does not judge the outcome. The other approach is to focus on the outcome, devising rules to get the more desired outcomes. Here a pro-growth policy would be mitigated with compensation to losers. In both cases, selective perception as to what rules and what out-

comes are on the agenda will shape the process of preference articulation.

Current Policy Dilemmas over Siting Large Livestock Facilities

Selective perception of rights and its implications for what are determined to be costs and benefits are central to the many conflicts arising from industrialization of animal production. A generalized account of community reactions to a modern large-scale swine production facility is presented below. It illustrates the pattern of industrialization impacts and how selective perception affects evaluations of change and policy decisions.

A rural county with few land use regulations has received a proposal for a permit from a farm enterprise to construct and operate confined swine production facilities to produce 4,000 hogs on six acres owned by a retired farmer. The permit applicant has acquired the needed state permits. The financial backing and contractual agreements for inputs and marketing the hogs have been obtained, and now local approval is needed.

The retired farmer selling land to the new operation, who will live adjacent to the facility, has stated that he believes the proposed operation's plans to manage manure will adequately protect water supplies and minimize odor and flies. Several local hog producers with smaller yet modern operations also support permitting the new facility. Some other farmers and businesses see the facility as an input needed to sustain the area's agricultural base. Larger farms, agribusinesses, and lenders see the new facility as a plus for the local economy, believing it will result in local jobs and increased input purchases.

Among the local farming community, concerns are being voiced quietly about whether farming at such a scale is a good thing for their businesses and the county's agriculture. Smaller, less specialized farmers using more traditional production practices have doubts about the proposal since they believe they may not be able to compete with the larger, more efficient operations. Other producers are worried that possible waste management mistakes by the large-scale farms will cause local support for agriculture, which they have worked to build and sustain, to decline. Several influential leaders have publicly stated their support of the proposal. They perceive the facility as an economic development opportunity for the area, which has seen declining business opportunities and job shortages.

All nonfarm neighbors within a mile of the proposed facility are opposed to granting the permit. Those adjacent to it are the most vocal in their opposition, believing they will incur losses from property devaluation due to odors. One resident has brought information to the hearing about the potential effects of prolonged exposure to manure odors on residents' mental health, including depression. Several residents are concerned about sicknesses that may result from contamination of their drinking water. One has obtained a study showing that even state-of-the-art hog waste lagoons leak and may contaminate nearby wells with bacteria and nitrates. A second is troubled about the potential of increased accidents from local truck traffic. There is anxiety that contaminated water, odors, and flies may extend over larger geographic areas, such as downstream of a watershed or into the local airshed where odors may linger and concentrate under some climatic conditions. Residents are concerned that even though the applicant has obtained the needed state water quality permits, limited state staffing will not provide the enforcement needed to protect the county's streams and lakes, which are used for fishing and other recreational activities. They also argue that no laws exist to protect them from odors and flies.

As a result of these concerns, neighbors and other interested county residents have banded together and requested that local officials deny the permit. Also, due to the potential adverse effect of large-scale livestock facilities on public health and welfare, they have requested that officials strengthen the county's land use and zoning ordinances. The county officials are reluctant to do this since they believe that these facilities are exempted by state law from such local laws because they are defined as a farm. However, several other coun-

ties have blocked the siting of large swine facilities in this manner. The authority of one of these county ordinances has been challenged and has not yet been settled in court.

Technological and market forces are conducive to hog expansion in this county, bringing with it a new set of potential consequences for market participants and the pattern of external effects. Whether a participant views the development as good or bad depends on the perspective from which these impacts are perceived. The proposed enterprise, including those linked financially or contractually to it, and the retired farmer selling the land will receive the lion's share of the benefits from permit approval. These benefits can be viewed as an entitlement, flowing from the institutions and property rights. Additional economic advantages will be distributed to farm workers and among the agribusiness sector inside and outside the county. Consumers would also likely benefit through lower pork prices, although this is likely whether the permit is approved or not. The market appears to be working well for conveying preferences for some attributes and some participants.

Many other participants face potential adverse impacts or costs, either through the market (declines in property values or losses for exiting less efficient farmers) or by being burdened with new costs (neighbors' well testing) or loss of benefits (reduced recreational benefits from degraded water bodies). Since existing institutional rules do not require large hog producers to consider many of these impacts in their decisions, they are simply borne by those unfortunate enough to be in the way of the changes brought about by industrialization. From the standpoint of some participants, it appears that the institutional mechanisms (markets or politics) for expressing preferences for some attributes of food system performance are either incomplete or inappropriate.

Clearly, industrialization creates benefits or entitlement for some groups and losses for others. Simply because the impacts are derived from new information and technologies and market forces does not mean that the outcomes are sacrosanct and socially correct. For instance, if property rights to water resources were held by the neighbors with private water wells or those who fish in the county's lakes and streams, the hog producer's costs would be higher. With these costs internalized into production, it is possible that hog farming would not be competitive at this scale or location. Moreover, property rights and our perceptions of them define what we call benefits and costs in debates about appropriate policy responses to industrialization. The political articulation of preferences will be greatly influenced by what gets on the agenda based upon perceptions about property rights, knowledge and political influence of the participants, and jurisdictional boundaries.

Jurisdictional Boundaries: Who Gets to Make the Rules of the Economic Game?

The concept of boundary is relevant at several levels in analyzing issues of preference articulation for food system attributes. Currently, many external effects occur beyond the boundary of the firms engaged in animal production and are not considered by firm decision makers or reflected in market prices. For political decisions, jurisdictional boundaries define the group whose voice gets heard in the process of specifying rights and granting entitlements. Ultimately, such political decisions define what is counted in production of a commodity. Externalities are costs not charged to the economic actor. Entitlements are rights to charge for use of a resource or rights to share in the output of an enterprise or community. Entitlements for some become costs for others. It is beyond the scope of this paper to deal with all of the rules defining costs and entitlements of relevance to the industrialized food system. In the remainder of the paper, we focus primarily on the relationship of industrialization of the livestock system and rules for use of natural resources, especially costs not counted by firms (i.e., externalities).

The opportunity set of an individual or firm is defined by the interaction of a complex set of interrelated federal, state, and local institutional rules. At the federal level, these rules are broad, including basic rights and respon-

sibilities from the Constitution and common law that frame the scope of issues open for decision at the state and local levels. This institutional context also includes specific laws, such as the federal Clean Water Act, which defines the rules for large confined animal feeding operations. We address the issues associated with selection of boundaries for making political decisions about the external impacts of animal production. The focus is on how the choice of state versus local institutions affects whose preferences count and the implications for performance. The conceptual issues inherent in jurisdictional boundary selection are discussed before turning to a review of specific state decisions.

Criteria for Jurisdictional Boundary Choice

An individual's ability to have public policies enacted that are consistent with his or her preferences depends on the tastes and beliefs of fellow citizens. The definition of the decision-making group depends on where the individual lives and how political boundaries are drawn. Since jurisdictional boundaries have received much attention (Tiebout; Breton; Oakerson; Schmid; Bish; Oates; Vihanto), only a selected overview of the criteria for selection is presented here.

Responsiveness

Conventional wisdom suggests that local governments are closer and are therefore more in tune with local conditions and with citizen preferences. Thus, it can provide an output more likely to satisfy local citizens. This follows from the maxim that the government that is best is the one that is closest to the people (Breton). However, depending on how particular boundaries are drawn, one can be a member of a majority or minority on a particular issue (Schmid).

Homogeneity of Citizen Preferences

If people in an area have similar preferences, larger jurisdictions that provide uniform outputs are possible. Conversely, if tastes differ, the establishment of more, smaller jurisdictions may allow preferences to be better satisfied. Homogeneous governmental units may form if people have the opportunity to move (although not costlessly) to units having the mix and level of public goods or services that they desire most (Tiebout). A related school of thought emphasizes the role of competition among local jurisdictions in helping to reveal preferences. The ability of citizens to exit disciplines governmental taxing, spending, and rule making, and allows discovery of new institutional arrangements (Vihanto).

Interdependencies: External Effects and Coordination Issues

The actions of governments, like individuals and firms, are interdependent. This leads to effects that occur beyond a government's borders and to related coordination issues. Such effects prompt recommendations to redraw jurisdictional boundaries to encompass the spillovers so that these costs will be considered by decision makers. Similarly, individual actions by jurisdictions may contribute to overall results that are not in the interest of a larger group of jurisdictions. One prescription is to seek involvement of higher-level authorities to coordinate actions, allowing the group to avoid costs or capture benefits.

Economies of Scale

The existence of economies of scale in provision of certain goods or services suggests larger jurisdictions that allow these advantages to be realized. However, if the distinction between provision and production of services is recognized (Oakerson), a government can realize the benefits of producing goods with scale economies, such as centralized waste treatment, without actually having to produce the service. They can act as governance structures to arrange for (i.e., determine need, finance, manage) without undertaking production itself.

Uniformity and Stability

Uniformity or stability in the output of certain goods or services of government may be desired in order to promote economic activity or to reduce uncertainty or costs. The lack of uniformity caused by excessive differences in outputs of local units may increase costs for firms whose activities span these boundaries. Similarly, it may be argued that uniformity is needed for equity reasons to create a "level playing field" for competition among firms or to assure that everyone receives a certain minimum level of a public good or service.

Favorable Political Rules (or Power and Influence)

An individual or group's ability to influence a particular decision may be greater at one level or another. This may be due to differences in the ways that preferences are aggregated. Examples include differences in the specific rules for representation of different interests, agenda setting, and policy implementation. In some cases, it may be advantageous for an interest group to shift a decision to another level in order to protect its position or create opportunities. Some have suggested that efforts to raise responsibilities to the federal level are actually efforts to limit the advantages of one region or industry over another (Parshigian; Libecap).

Problems of Preference Articulation: Free Riders, Unwilling Riders, and Transactions Costs

If two people are going from *here* to *there,* and two routes exist to get to *there,* and if each person has a different preference for the route, then a problem of preference articulation arises. The two travelers can work out an agreement and share the ride or, at twice the cost, travel separately. Negotiation can possibly lead to compensation of one to accept the other's choice of route. But determination of the compensation is a game theory problem. Now consider the problems of markets and governments with many participants. Working out compromises is expensive since transactions costs are very high. There will be free riders letting others pay the cost of working out solutions and taking advantage of compensation payoffs, even when none would have been required to gain participation. And there will be unwilling riders unable to afford the transactions costs to achieve desired compromise outcomes.[1]

In political preference articulation, there are high costs of information about alternatives and consequences, and very high transactions costs in working out compensating compromises. Decisions may not be consistent with preferences. Most citizens end up as free and unwilling riders on a range of issues. The big difference is between concentrated and dispersed interests. In the intensive hog operation case, some participants—the firm owning the facility, the retired farmer selling the land, and adjacent neighbors—have the greatest stake in the outcome. Many others may care about the outcome for them, but the benefits are small relative to the costs of becoming informed and politically active. Once beyond the scale of a town meeting, representative government and interest group politics are needed to work out compromises. A large body of literature on rent seeking exists, which generally takes a dim view of interest group politics. But there is no practical alternative to interest groups working out compromise solutions to the definition of rights and defining costs. Thus the rules for organizing, financing, and exercising influence become critical in determining the rules of the market and resource use. This point becomes obvious in dealing with intensive animal agriculture.

[1] The problem is similar for markets and politics, but is more obvious in political preference articulation. For example, Henry Ford was able to deliver very low cost cars—all black and identical. Competitors offered variations. Because economies of scale and scope were lost, prices for all cars increased. There was no feasible means for car buyers to express a preference of the low cost system with compensation to those who preferred a more expensive car but would have preferred the cheaper car and a bonus. Transactions costs for working out the compromise were too high. The market is full of such examples.

Jurisdictional Boundary Issues and Their Implications

In this section we selectively review recent state and local policy changes for dealing with the external impacts of animal agricultural production. The implications for issues of preference articulation and jurisdictional boundaries of these developments are also presented.

Policy Responses to an Industrializing Animal Agriculture

The current governmental units addressing externalities from animal agriculture are mostly at the state and local levels. As a result, there are significant differences in environmental regulations and ways costs are counted across geographic areas. Permitting for large confined animal feeding operations under the Clean Water Act is an exception, but this program's implementation has been limited in scope (Smith and Kuch). A trend of the 1990s is to devolve authority to the states. Within states, different criteria have been used by various interest groups to argue for the jurisdiction to be given responsibility for decision making.

Pennsylvania

Concern about water quality in the state and in the Chesapeake Bay, as well as residents' fears about nuisance odors from swine expansion in some regions, motivated passage in 1993 of the Pennsylvania Nutrient Management Act. The act requires all farms with more than two animal units per acre to implement a management plan certified by a nutrient management specialist. A key feature of the law is the preemption of local laws affecting nutrient management on farms. It prohibits local governments from enacting ordinances concerning animal nutrients that are stricter than those required by the Nutrient Management Act. Prior to 1993, townships in south central Pennsylvania were developing ordinances to address problems from animal expansion. This local preemption provision was sought by the state's major agricultural organizations because of concerns about non-uniformity of ordinances (the state has more than 2,500 municipal units). The technical capacity of municipal units to develop and enforce such laws was another key argument for local preemption. Regulations are expected to be finalized in early 1997, and in place by the fall of 1997. Until the law goes into effect, municipalities still retain the authority to regulate animal nutrients, but such activity has slowed substantially since the law's passage. However, the legality of local preemption is likely to be challenged and may need to be settled in the courts.

Iowa

In mid-1995, Iowa enacted the Animal Feeding Operations Act, creating many new requirements for poultry and livestock producers and additional defenses against nuisance lawsuits. Important components of the law include: separation distances between buildings, lagoons, and manure storage structures and nearby residences; state construction permits for certain facilities; an indemnity fund generated from permit fees; manure management plans; habitual violator penalties; and manure disposal requirements (Gault and Baumert). The state's natural resources agency developed rules to implement the act that became effective in March 1996. The law has made nuisance suits more difficult by clearly placing the burden of proof on those initiating such suits, increasing the standard of evidence needed to prove that a nuisance exists and was caused by a facility, and making all legal costs of suits the responsibility of the initiator if the suit is found to be frivolous.

Recent decisions by administrative offices and the courts in Iowa suggest that counties have very little or no decision-making authority over confined livestock operations. In 1996, the Iowa Attorney General responded to a request from a county that wished to create ordinances to regulate the location, construction, and waste disposal of swine facilities. The office concluded that by enacting the Animal Feeding Operations Act, the legislature had reserved the regulation of both large and

small confined feeding operations to the state, thereby precluding the possibility of local regulation (Benton).

County officials in Iowa attempted to regulate large swine facilities through their zoning authority, but were thwarted recently by a state Supreme Court decision to expand the definition of a farm to include specialized production facilities. The court contradicted an earlier landmark case decision that left open the possibility that "commercial" farms were not subject to the agricultural exemption from local zoning. In its 1996 decision, the court concluded that a 2,000-head unit proposed on five acres was an agricultural activity. This decision broadened the definition of a farm to include the rearing and management of livestock irrespective of feed supply or the owner's other farming activities (Marbery, December 1996).

North Carolina

Counties are prevented from using zoning to regulate large-scale swine facilities due a provision in their state law that exempted "bona fide" farms, including large-scale livestock facilities, from county zoning (Copeland; Heath). In response to a county's enactment of an ordinance that created a definition of such a farm, a state law was enacted in 1991 to specifically include livestock facilities within the definition. This act came at the initiation of the North Carolina Farm Bureau (Stith and Warrick). The nation's largest manure spill to date—25 million gallons from a waste lagoon at a large hog facility in eastern North Carolina in June 1995—provided impetus for strengthening the state's regulatory programs. A commission established by the legislature after the spill produced a series of recommendations that were adopted by the state legislature in mid-1996. Important features of the law addressing hog producers include: annual inspections and operational reviews, creation of a state general permit, and requirements for owners of new or expanding farms to notify nearby landowners (Dew). One general "nondischarge" permit exists under which all regulated livestock operations must be registered and approved (Feitshans).

In North Carolina, a state-level zoning preemption has not stopped counties from attempting to regulate hog farming. Five counties have used their powers under state statutes allowing them to adopt stringent statutes to protect public health (Buggs). The first major test of the legality of local action of this type may come in a suit by Carroll's Foods against a Robeson County ordinance (Marbery, November 1996).

South Carolina

In 1996, South Carolina passed one of the nation's toughest comprehensive hog waste disposal laws. Under the new law, large producers[2] must obtain permits and smaller ones must comply with guidelines to be developed by the state's environmental and health agency. Important elements of the law include: setbacks of manure lagoons from nearby properties and water bodies, standards for lagoons and application rates of manure on farmland, annual inspections of lagoons and monitoring wells, and record keeping and training of facility operators. The law also has provisions for odor control (Marbery, June 1996).

One interesting aspect of the development of this bill is that it originated as an effort by the major state agricultural organizations to establish statewide uniform guidelines for animal waste management and to preempt counties from enacting laws in this area. The effort proved unsuccessful, however, as local governments rallied to oppose limits on their authority (McKenzie). Local officials' concerns about preempting their authority, in combination with an awareness on the part of other interest groups of the environmental and nuisance impacts associated with the rapid growth of large hog facilities in North Caro-

[2] The threshold contained in the legislation for dividing large and small farms was 420,000 pounds of animal capacity (roughly 3,000 head of finishers, 1,100 sow farrowing units, and 300 sow farrow-to-finish operations). Regulations to implement these thresholds and other aspects of the law were being debated in early 1997.

lina, shifted the outcome away from the preemption goal that was the bill's original intent.

Kansas

Recent developments in Kansas illustrate how concerns about corporate farming, environmental quality, and nuisance issues interact and how the outcomes depend on the jurisdictional boundary chosen. In the early 1990s, several counties wished to expand their animal industries and felt they were constrained from doing so by the state's corporate farming law. This law was amended in 1994, allowing county commissioners to permit corporate farming, provided they have the support of a majority of registered voters via a referendum (McEowen and Wadley 1994). Twenty-three counties subsequently approved corporate farming. Due to a complex of concerns related to environmental, nuisance, and corporate farming issues, several counties recently reversed their policies, creating much controversy and uncertainty. Several large hog corporations that had made significant investments in the state claim such reversals constitute a "taking" (Marbery, March 1996). The state's attorney general has ruled that counties have the legal authority to make such changes in law in the public interest, based on the "home rule" defense. However, the attorney general's office is not the final arbitrator (McEowen and Wadley 1996). Legal uncertainties remain to be settled in another jurisdictional unit, the courts.

Perception of what is to be defined as a taking varies among jurisdictions, with courts making judgments imposing preferences about rights on legislative jurisdictions. In this case, changing the rules, and thereby creating a loss in the value of an investment in a hog operation, could conceivably be judged in the future as a taking requiring compensation. At the same time, the loss of value in neighboring land due to odor is less likely to be judged a taking by a distant court than by local voters who judge the odor and property value declines to be an unacceptable cost. And it is certain that the increase in land values resulting from a law allowing large hog operations will not be taken from the benefitting landowner and given to those imposed upon by the odor. As argued before, perception of rights is highly selective.

Implications of Recent Developments

Several observations may be made about whose interests appear to be served by institutions at different jurisdictional levels. These themes are discussed along with supporting evidence from states. The observations are tentative and await verification in future research.

The Bundling of Concerns and Where They Get Expressed

As academics, we can talk about the "water quality" issue or the "odor" issue. In the real world, such distinctions are blurred. For areas for which no rules exist to deal with new or newly perceived consequences from industrialized animal agriculture, there are important implications for preference articulation. In many cases, nuisance issues, such as odor, have no existing legal framework either to define them or to force them to be taken into account. People concerned about them get frustrated and attempt to register their preferences by whatever means are open to them through interest group politics. This is often accomplished by attaching one issue to another issue that already is recognized as legitimate, such as protecting water quality (Hamilton; Abdalla and Kelsey). Interest group politics and selective perception of rights may result in preferences being worked out in unexpected jurisdictions. In some instances, odor may be the real local issue but the preferences for protection from odor of livestock enterprises may be expressed by support for more stringent state water quality rules. Recent developments in Kansas provide an example of bundling of corporate farming concerns.

Organized Interest Groups Have Reasons to Prefer State-Level Regulatory Authority over Local

In three states reviewed here, organized agricultural interests supported state involvement

and preemption of local laws regulating animal agriculture. The problem with local regulations was the lack of uniformity or a "level playing field" due to the potential for proliferation of many local ordinances. When proliferation of different laws occurs, the costs for firms with activities that span across the local jurisdictional boundaries increase. Given the sizable investment needed for modern large-scale animal facilities, the stability and predictability of regulations that affect costs are critical to investors. State-level regulation is more predictable than autonomous actions of many local units. In addition, local governments, because they are unable to capture economies of scale, may have less technical capacity to develop or implement effective regulations.

Agricultural and other interests may also prefer state decision making because they are able to more effectively influence legislation and implementation of laws affecting animal agriculture at the state level compared to the local level. There is evidence that this occurred in North Carolina (Stith and Warrick) and Pennsylvania in the 1990s. This last observation is consistent with arguments made by Libecap and by Parshigian regarding calls for regulatory authority to be raised to a higher level (federal) by industries seeking protection from competition and other forces of change.

The economics of political influence clearly leads to a general preference for state-level regulatory authority by organized interest groups. Monitoring and lobbying at the state level is much less expensive than providing these services at hundreds of local governmental units.

Food industry, agribusiness, and related economic development groups are likely to have a general preference for a statewide uniform approach to regulating animal agriculture for the same reasons just discussed for organized agricultural interests. Uniformity and predictability of regulatory costs are important in promoting investments in large-scale animal enterprises which are perceived to contribute to the growth of regional and state economies. The economic benefits of expansion of animal production are likely to provide broad-based benefits to a regional economy, whereas the potential costs are more likely to fall on people in the individual jurisdictions where facilities are located.

In addition, state-level environmental groups and the agencies they seek to influence have reasons to favor state approaches that can provide more control and predictability in meeting statewide goals. They may wish to "rationalize" the disparate efforts of local governments and also be skeptical of the technical capabilities of local government representatives and personnel.

Unorganized Residents Have Reasons for Preferring Local Regulatory Authority

Nearby residents and others closest to the problems of animal agriculture tend to want rules from the level of government that is closest to them. Such groups may believe that local governments are more responsive to their interests, more knowledgeable about local situations, or perhaps can act faster to address problems. In the past, rural residents may have been more similar in their attitudes about agriculture, seeing it sometimes as a polluting activity, but one that contributed to the rural economy and provided open-space benefits. However, large-scale animal agriculture is changing these perceptions and attitudes. Nearby residents affected by potential water degradation, nuisance odors, and other issues, have quite different perceptions of benefits and costs from large-scale animal enterprises than the general population. Consequently, they often oppose them. In such efforts, they are likely to feel that local governments are more responsive to their interests than bureaucrats located in offices far from their homes and communities.

The Institutional Learning Process

The political economies of the different states have become interdependent. Cross-state in-

stitutional learning can take different forms.[3] South Carolina, for example, learned from its neighbor to the north and decided against local preemption in passing strong environmental rules for large hog enterprises in 1996. Only three years earlier, there was little opposition from local governments in Pennsylvania to a nutrient management bill that contained a local preemption provision. One difference between these two time periods is expanded public awareness of environmental and nuisance problems from large hog operations resulting from major manure spills in 1995 in North Carolina and the midwest (Smothers; Hendriks; Satchell). Also, a state moratorium on hog expansions in Missouri in 1996 may have affected the North Carolina legislature's decisions to enact tougher regulations than it would have otherwise (Marbery, June 1996).

Interestingly, North Carolina, the fastest growing swine production state, appears to be moving toward allowing greater involvement of neighbors and local officials in regulatory decisions. In contrast, the institutional rules in Iowa, a state with a dominant industry position that has recently been challenged, has significantly limited opportunities for local input in such decisions. This may be due to a different balancing of the economic benefits and environmental and nuisance costs for each state depending upon its phase in the life cycle of growth.

Final Comments

We have framed the issues related to the industrialization of animal agriculture as the "working out" by participants of new rules of the economic game in response to newly perceived opportunities to profit from adopting new technologies and organizations of production. We have considered both the rules of the game, which define what gets counted as a cost by firms, and the rules defining the jurisdictional boundaries for rule-making authority.

In the industrialization of animal agriculture, one set of issues is best framed by the following statement: The process of constant transformation driven by opportunities for profits produces winners and losers. Here the issues have to do with protection of existing values and rights to economic opportunities. In the great transformation of the U.S. food and agricultural system, many protective and compensating policies were adopted. Farmers are losing their status as a group that deserves special protection. The issues in respect to the transformation are in the same category as corporate downsizing, superstore chains replacing local owners, and automation and international competition replacing domestic factory workers.

The transformation issues include: (*a*) rights to compensation for losses resulting from economic transformations or rights to restrict such changes to protect selected interests; (*b*) rights to share in benefits of transformations, including entitlements to compensation for real and perceived contributions (current, expected, and in the past); and (*c*) rights to choose the kind of economy and community we live in (size, fairness, congestion, rate of change, etc.).

The second class of issues deals with access to resources, especially shared resources like air, water, and space. The basic issues involve the rights to use or prohibit use of the resources and the rights to compensation for changes in access or values of these resources. The two classes of issues come together when communities compete for enterprises on the basis of environmental regulations which influence the cost of doing business in different locations.

Broadly framed, the issues go to the heart of the role of governments in our society and involve the expression of preferences about the role of government at all levels. Neglected in this discussion has been the importance of implementation of the legislative rules of the economic game. This takes us to the issue of jurisdictional boundaries among implementing

[3] The learning can go in a direction to weaken environmental regulations as well. For example, in another economic and political climate, development interests may lobby for regulations providing competitive advantage, thereby leading to the "race to the bottom."

agencies. For example, is it an issue for a state environmental or agricultural department?

There is no avoiding the issues. Without directly addressing the changes, the system of rights and costs that currently exist will regulate the market. If these rights are not specifically defined to deal with changes in the economic opportunities, the market will work out solutions; those who can capture the benefits under existing rules will get them.

Preferences for the rules of the game are seldom expressed directly by a specific vote. Preferences are usually expressed by electing representatives, perhaps based on party positions, and by participating in groups that have political influence. Voting for representatives is similar to choosing among restaurants with nothing but "blue plate" specials. Articulation of preferences via political influences is highly biased in favor of the concentrated interests. Political preference articulation is made very difficult because of the high levels of uncertainty of the relationship between a change in a rule for the economic game and the performance consequences.

So what are the implications of all this for the roles of agricultural economists in dealing with the emerging issues related to the changing organization of livestock production? Several specific suggestions that would facilitate more effective research and policy education are detailed below:

(1) To contribute to a better understanding of the likely level and distribution of benefits and costs following from specific changes or failure to make changes in the rules for the livestock sector.
(2) To contribute to a better understanding of the institutional system that defines the rules of the game for the livestock system providing a context for policy.
(3) To pay particular attention to the problems of preference articulation for the dispersed interests, reducing their costs of information and participation.
(4) To contribute to the process of working out compromise solutions to emerging issues and conflicts of interests. Perhaps the most important contribution would be to promote a fundamental understanding of the democratic process and the roles of government in articulating the rules of the economic game for a democratic entrepreneurial market economy (which remains an experiment to be proven sustainable).

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