

**The Economics of Pasture Raised Animal Products:
Food, Markets and Community**

**The Economics of Pasture Raised Animal Products:
Food, Markets and Community**

A white paper of the C.S. Mott Group for Sustainable Food Systems
at Michigan State University

David S. Conner and Michael W. Hamm

July 2007



www.mottgroup.msu.edu

Comments from the following reviewers from Michigan State University were instrumental in the final version of this paper; their efforts are acknowledged and appreciated: Professor Steven Rust of Animal Science and Professor J. Roy Black of Agricultural Economics.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Small and mid-sized farms raising animal products have great potential to contribute to the overall well-being of our rural communities. However, better marketing opportunities are needed before these benefits can be realized.

Introduction

While agricultural industrialization has achieved the goal of high yields and low food prices (Antle, 1999), there are a number of documented adverse effects on the economies, communities and environments of rural America. Groundbreaking work by Goldschmidt (1947) and others (Lobao (1990); Welsh and Lyson (2001); MacCannell (1988); Durrenberger and Thu (1996); Lyson, et al. (2001)) illustrates the importance of small to mid-sized farms to the social and economic well-being of rural communities. Of particular consequence appear to be the existence of an independent and entrepreneurial middle class of farms, such as full time owner operated family farms.

Small and mid-sized farms utilizing rotational grazing and other pasture-based production technologies are uniquely positioned to maximize both the socio-economic and ecological services to rural America. Furthermore, they are well-positioned to meet growing consumer demand to “know where the food comes from,” for meat and dairy products with key consumer-requested attributes such as hormone and antibiotic free, ecologically and humanely produced, and “food with a farmer’s face on it.”

Data from recent agricultural censuses shows that while small (< 50 acres) and large (>1,000 acres) farms are maintaining or even increasing their numbers, mid-sized farms are declining precipitously in number. In the north central region, almost ten percent of these farms went out of business between 1997 and 2002. A major reason is the lack of appropriate markets that generate sufficient profit for these farms. Many small farms subsist by tapping niche markets for specialty products and using face to face direct sales channels; mid-sized farms produce too large a volume to rely solely on these markets, yet sell too few units to survive on the slim margins available in commodity markets and contract agriculture.

Expansion of the value chain concept holds great promise for mid-sized farms’ survival and prosperity. Defined as “a connected series of organizations, resources, and knowledge streams involved in the creation and delivery of value to end customers,” it seeks to “position organizations in the supply chain to achieve the highest levels of customer satisfaction and value while effectively exploiting the competencies of all organizations in the supply chain” (Value Chains Partners for Sustainable Agriculture, VCPSA, www.valuechains.org, (accessed August 2004).). It is able to deal with volumes appropriate to mid-sized farms, often operating on a cost-plus basis to ensure fair returns to all agents in the chain. Transactions are transparent and generally seen as between partners with shared interest and destiny rather than by each party trying to get the better of the deal at the expense of others. Value chains allow groups of producers to cooperate to achieve a scale of supply needed to utilize market opportunities while still maintaining their independence and flexibility. This concept has been expanded to

The Economics of Pasture Raised Animal Products: Food, Markets and Community

consider “values-based value chains”: transparent, long term and trust-based supply chain partnerships which preserve and identify the underlying values and uniqueness of the products.

This paper will look at the current market and prospects for pasture raised animal products. Its intended audience includes academics, extension educators, agricultural professionals, non-governmental organizations and others interested in exploring and supporting differentiated pasture-based agriculture as an option for small and medium scale farms. Beginning with a definition of key terms, it uses reviews of literature and comments from key informants in the north central region to provide an overview of knowledge and experiences relative to the size and scope of the market, consumer demand, production efficiency, processing, distribution and marketing issues, and impacts on rural communities. Many cited articles are from sources other than peer-reviewed journals; we acknowledge a lack of attention devoted to pasture-based agriculture in the current academic literature, and the difficulty of judging the robustness of results and conclusions in many of the papers and articles cited below. We include articles of many types in the hope that this paper will stimulate further debate and research on issues surrounding pasture-based agriculture both in and out of formal academic settings.

Much of the discussion distinguishes between two paradigms of animal production: (1) the centralized commoditized model marked by fewer numbers of larger farms, utilizing animal confinement and grain based diets, often tied to large agribusiness corporations (via vertical integrations, contracts), selling to national and even global markets; (2) the decentralized non-commoditized model, marked by larger numbers of independent smaller farms, utilizing pasture and grass-based diets, selling to local consumers. These models are similar to those discussed by Conner (2004), who notes that these two paradigms “lie at the extreme ends of a continuum, with most if not all farms falling in between the two. The division into two distinct paradigms is to illustrate critical choices we make as to the nature of our food system,” (p.28). Patton (2002) refers to such a continuum as a “typology” with “ideal types” or “illustrative endpoints, rather than a complete and discrete” category (p.457).

Definitions of Terms

A number of terms have arisen in recent years to describe animal products raised by methods other than the now common confinement and feedlot approaches. Some of these terms (organic, natural, free range) have legal definitions, while others are simply descriptive terms used at the discretion of producers.

“Natural” is often erroneously thought to mean that no sub-therapeutic antibiotics, hormones, etc., were used in its production. However, “a product containing no artificial ingredient or added color and is only minimally processed (a process which does not fundamentally alter the raw product) may be labeled natural. The label must explain the

The Economics of Pasture Raised Animal Products: Food, Markets and Community

use of the term natural (such as - no added colorings or artificial ingredients; minimally processed.)” (USDA FSIS (a) accessed August 2004).

“Organic” means that the production, handling and processing conforms to the USDA National Organic Program’s (NOP) regulations; for livestock, these regulations include the use of organic feed, no use of hormones or antibiotics, and access to outdoors. The definition of “free range” only means that birds have access to the outdoors, able to go outside at any time. The USDA defines this term for poultry, but not for eggs. The Consumers Union considers this term to be neither meaningful nor verified. Critics claim that since the law defines only that outdoor access must be made available for an unspecified period each day, with no guarantee the bird actually goes outside at all (Consumers Union, accessed August 2004).

The USDA Food Safety and Inspection Service (FSIS) governs the use of some terms, such as: raised without added hormones, raised without antibiotics, not fed animal by-products, free range, free roaming, grass fed, corn fed, grain fed, certified organic (by certifying entity) (USDA FSIS (b) accessed August 2004). In most cases, the producer must provide documentation to USDA demonstrating the truthfulness of the claim. Nonetheless, some terms are confusing. The claim “100% grass fed” (a term often used by farmers) implies the animal (typically a ruminant like a cow) has eaten no grain, but the USDA FSIS meaning of “grass fed” is not apparent. Nearly all cattle eat grass at some point in their lives. It is not clear how much grass (or how little grain) is needed in an animal’s diet for it to qualify as “grass fed.”¹

Another category of claims includes terms the USDA deems to be “unapprovable” (USDA FSIS (b) accessed August 2004). These terms include: antibiotic free, hormone free, residue free, residue tested, naturally raised, naturally grown, drug free, chemical free. In some cases, such as hormone, antibiotic, drug or chemical “free”, either the term is too vague or no test can practically verify the absence of the substance. Terms such as “raised without” or “not fed” are preferred since these claims are based on observable actions directly controlled by the farmer.

“Pastured” seems to be a loose term, applied to both ruminants and non-ruminants. In the case of chickens, it is generally identified with birds that actually live outside, usually in pens that are moved around the pasture. They are able to eat grass, wild plants and insects as well as feed grains.

Size and Scope of Market

Due to the lack of precise definition of grass fed, sustainable or pastured, it is difficult to state the volume of production or sales of these products. What is certain, however, is that organic meat and dairy production have been steadily increasing. According to 2001 USDA Economic Research Service data, there were 1,039,505 acres of certified

¹ USDA is currently working on specific standards for grass-fed meats.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

organic pasture in the US, an increase of 109% since 1997 and an increase of 28% since 2000. There were 6,949 certified livestock operations. US organic farms had 71,216 certified mammals (cattle, swine, lambs, etc), including 48,667 dairy cows, and 4,996,771 poultry, of which roughly two-thirds were broilers. Michigan had only 1019 acres of organic pasture/rangeland, compared to 45,466 acres of crops. Michigan also had 637 certified mammals (247 dairy cows) and 53,946 poultry (52,335 layer hens). Many articles in the popular press (e.g., Doering, 2004) have stated that demand for organic meats is greater than supply. The Organic Trade Association (cited by Doering, 2004) claims that organic beef, with US sales of almost \$10 million, accounts for less than one percent but the market is growing at 30% a year. Supply of organic chicken has grown to meet demand more quickly than beef, due to chicken's faster production time. US sales of organic chicken are currently about \$46 million per year. Meats (2003 data) comprise about 1% of organic food sales; dairy, about 13% (Organic Trade Association, 2004).

Consumer Demand

A portion of consumers are generally favorably disposed toward pasture-based products and many are willing to pay a premium. Pirog (2004) found that about 10% of consumers in a non-random sample of four Midwest regions already buy organic beef or dairy products. A majority was aware of perceived benefits of pasture raised products, and about 10% were willing to pay premiums of 30% or more for locally produced natural milk. Pirog's (2004) study utilized the internet, which is likely a biased sample. A study by The Kerr Center (2001) found that consumers had a favorable view of "all natural" meat products and were willing to pay a premium for them. Pirog (2004) also found that the term "pasture raised" is the one most likely to be recognized and viewed favorable by consumers. This is in contrast to Smith et al.'s (accessed August 2004) discussion of a study by Food Routes (accessed October 2005), that says the terms "pasture raised," "organic," and "grass fed" made no difference to consumers in the Philadelphia region, implying the need for better communication with consumers. Many factors may explain this difference: different regions, urban versus rural, different time frames of the studies, etc.

People have reported a willing to pay premiums for naturally raised pork products as well. Armagh and Kennedy (2000), Hurley and Kliebenstein (1998) and Grannis and Thilmany (1999) report consumer willingness to pay premiums for pork products described with the terms "pasture-raised," "environmentally sustainable" and "natural," respectively. Wheatley (2001) concludes that these premiums will likely persist and be passed on to producers.

A study by the Food Processing Center (2004) also suggests a market for locally grown and naturally produced meat and chicken. The results of a phone survey of four states (NE, MO, WI, IA) find that about 55% of respondents have purchased meat directly from farmers, mentioning knowing who raised it as the most important factor. Slightly less than half (46%) of all respondents stated they would pay a premium of at least 10%

The Economics of Pasture Raised Animal Products: Food, Markets and Community

over the “typical retail price” for locally produced meat. Between one-fourth and one half of respondents have purchased/would purchase chicken (47%/32%), beef (45%/29%) and pork (34%/36%). Pastured poultry also has strong market potential. Of those who have purchased pastured and/or free range poultry, over 62% would pay a premium of 10% or greater for these items. Of those who have not purchased either, 51% are either very or extremely interested in buying these products, preferably at a grocery store. About one-third (35%) of those not currently buying pastured/free range poultry stated they would pay a premium of 10%.

These studies confirm the existence of niche markets in which seemingly significant segments of society are willing to pay a premium for what they consider to be premium products. What is not implied, however, is that the general public is willing to seek out these products in unfamiliar locations and change their purchase behavior even if they have positive perceptions. Certain products that have been able to gain entry into mainstream supermarkets, such as dairy, have done better than those which have not. However, no study to date implies that people are ready to support a major shift in how animal products are produced and distributed.

On a positive note, however, it is clear awareness of the issues is growing. Certainly, “process attributes” (Caswell, 1998) –how something was produced – are of increasing importance to consumers. This is reflected in the rapid growth of organic agriculture, as well as institutions of “civic agriculture” (Lyson, 2000) such as farmers markets, community supported agriculture farms, etc. Many observers believe that demand for natural or organic meat products currently outstrips supply (Kevin, 2004; Doering, 2004), indicating potential growth once supply and distribution issues can be met.

To the extent that value chains are able to facilitate the availability of pastured products at people’s regular shopping and eating locations, they will provide greater opportunity for consumers to translate these positive perceptions of embedded values into increased sales. Factors such as energy prices, changing technologies and government regulations, etc., will likely have profound (and probably favorable) impacts on prices of pasture-based products relative to commodity alternatives.

Production Economics: Efficiency, Profitability and Farm Viability

Although large industrial-based animal farms are often touted as being more efficient, some evidence suggests that this may not be entirely true and is dependent on the animal in question and other factors such as time frame, management and location. Pasture-based production can achieve lower labor, waste disposal and feed costs as well as exploiting economies of scope. In general, pasture-based systems can provide alternatives for diversification and viability for many types of farms. Anecdotes from farmers and extension educators suggest that while row crop production requires intense labor input during certain periods, pasturing entails every day tasks such as: moving animals, fences and watering equipment; monitoring the pastures; etc.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Below is a discussion of these issues for hog, dairy, beef and poultry production. The sections on hog and dairy are much longer and more substantive; less research of this kind has been conducted on beef and poultry. While the hog industry underwent rapid changes, the issue generated much interest among academics, policy makers, citizens, farmers, etc. Despite this interest, most small scale hog producers survive today by capturing niches for differentiated products. Dairy is currently undergoing consolidation, but many smaller scale operations survive. Poultry, in contrast, experienced these changes longer ago: it has been a “done deal,” so to speak, for some time, except for niche markets for pastured and other differentiated products. As for beef, cow-calf operations are and will likely continue to be predominantly pasture-based.

Hogs

Hog production has been the subject of much research and controversy, no doubt due to the high degree of industrialization it has experienced. On one hand, many studies find economies of scale in hogs at almost all levels of production. Barkema and Cook (1993) cite 1990 USDA data showing declining average costs as hog herd size increases: a 30% cost savings going from 140 to 10,000 head. Hurt cites economies of scale as a leading driver of industrialization in hog production. Rhodes (1995) states that “larger producers are winning larger market shares because they are, on average, more efficient than the majority of the smaller producers and because their large corporate organization is more conducive to continued expansion,” (p.111).

Other studies bring these conclusions into doubt. Using data from the Iowa Farm Business Association, Duffy² finds no economy of size advantage on operations over about 250 hogs. Farms in the category of 151-250 sows achieve the lowest average total economic cost per hundred weight of pork produced. He describes the average cost curves of most farm enterprises (including hogs) as being L-shaped, demonstrating initial economies of size that flatten out within scales achievable by mid-sized farms (Duffy 1998). Langemeier and Schroeder’s (1993) study of farrow-to-finish hog operations states that farms with less than 200 sows often have lower per unit costs than larger farms. They further find that production costs tend to vary more between farms of a given size than between farms of different sizes, and that feed costs account for about half of variability in costs. Mueller (1993) also finds that farm size alone is not a contributing factor to economic efficiency: “what is important to profitability is the managerial talent...regardless of the size of the hog operation,” (p.5). Barkema and Cook (1993) describe the factors they believe led to the industrialization of the hog industry: discriminating consumer tastes; technology enabling these preferences to be realized; and a tight market structure improving flow of information from consumer back to producers. They claim that consumers want more convenience and less fat. Critics (e.g., Wright, 2004) claim this has resulted in uniform but “bland” cuts of pork. Thu and Durrenberger (1998) counter that traits tailored to consumer preferences would include more convenient servings, not uniformity, a trait that favors easy packing.

² Data and analysis provided via a personal correspondence with Michael Duffy, Professor, Department of Economics, Iowa State University

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Studies by Honeyman (1991 and 1996) infer that transition to alternative hog production can result in lower fixed costs, lower than expected labor costs. Labor times (in Minnesota, VanDerPol 1999) and waste disposal costs (in Mississippi, Moore and Herndon, accessed August 2004) of pastured hogs can be less than under confinement systems. Wheatley (2001) concludes that the production cost differences between conventional and naturally raised pork products are negligible, but cites the costs of developing human capital and managerial skills as being important to the transition.

Crabtree (accessed August 2004) cautions that small independent hog producers face discrimination from packing plants (who favor larger producers), lenders (who are more likely to give credit for confinement operations and production under contract) and research institutions (whose agendas tend to support large confinement operations). Welsh (1996) states that independent hog farmers receive lower prices for the same product than those prices received by large scale, corporately-owned facilities. Ginder (1998) cites small independent producers' inability to invest in production assets as the prime reason for their reduced position in the industry. Industry forces favor the shift of using more abundant resources (family and operator labor) for more scarce ones (capital) (Ginder, 1998). In general, farms expand to increase income not efficiency; increased volume is needed to earn a living with today's tight margins.³

Thu and Durrenberger (1998) imply that large producers in the 1980s increased production in the face of constant consumer demand, driving the price of pork to historic lows and small producers, unable to maintain operations, out of business. They conclude that these large producers created rather than adapted to market conditions; their success, therefore, is not due to efficiency and adaptation.

Pastured hogs can contribute to a farm's financial well being and diversification. Wheatley (2001) finds that natural and organic pork products can bring a premium price and often have more stable pricing than the volatile conventional pork market. Honeyman (1991 and 1996) states that alternative pork production presents opportunity for beginning, part-time or risk-averse farmers because it allows for expansion with less investment.

Dairy

Dairy farms utilizing rotational grazing exhibit lower production costs and higher profit per animal than confinement operations. A study by Kriegl and Frank (2004) compares the economic performance of three dairy systems (management intensive rotational grazing (MIRG), traditional confinement and large modern confinement) over eight years. They find that the MIRG system has the lower costs and higher net income per output unit than confinement systems. Several other studies using on-farm data (Dart et al., 1999; Foltz and Lang, 2001; Gloy et al., 2002) confirm that grazing dairies achieve higher net income per cow than conventional dairies. Ostrom and Jackson-Smith (2000) find that the MIRG system, compared to non-intensive grazing and

³ Personal correspondence with Michael Duffy, Professor, Department of Economics, Iowa State University

The Economics of Pasture Raised Animal Products: Food, Markets and Community

confinement systems, results in lower labor, debt and investment per cow, higher net income, plus more vacation time and greater quality of life for farmers. MIRG users are more likely to be new farmers, attracted by the lower start up costs and capital needs of MIRG; “clearly, MIRG systems offer attractive entry opportunities for new farmers,” (p.9). Analyzing several studies, Johnson (2002) concludes that being the lowest cost dairy farm does not always mean being the most profitable: “rather than cutting all expenses, focus on cutting the right expenses,” (p.13) he states. Tauer and Mishra (2003) conclude that variable costs are fairly constant across dairy farms of all sizes and that small farms can be competitive under a number of milk price scenarios.

The cost savings from MIRG can foster dairy farm profitability even if milk is sold through commodity pools. Furthermore, product differentiation can bring higher and more stable prices. Organic dairy firms offer premium and consistent prices to farmers; they can do so because they are not tied to traditional dairy markets (Marshfield News Herald, 2003; Time Magazine, 2003). Currently, organic certifiers require that grazed forage be a significant portion of dairy cows’ diets, although grazing is only a part of the requirements to be certified organic.

Beef

Production of feeder cattle is still largely decentralized, independent and pasture-based; herd size does not appear to be an indicator of efficiency. Using Standardized Performance Analysis Data from the National Cattleman’s Beef Association, Lamb and Beshear (1998) find that while small “hobby” farms have high costs, no scale economies exist for cow-calf farms having between 200-500 head. They believe no scale economies are found in cow-calf production because cattle raised for slaughter are kept on grass as long as possible before being placed on feed because feeding represents a much more expensive way of adding pounds than grazing.

Featherstone et al. (1997) state that increasing the size of cow-calf operations will not result in large cost savings. They find that most scale economies are exhausted at a herd size of 48 cows, which was close to the average herd size in Kansas at the time of the research. Much of this may be explained by economies of scope on smaller, more diversified farms. Production cost studies of cow-calf ranching enterprises from two regions in California find that both scenarios (one 300 head cow-calf, the other 200 head cow-calf with a 30 head grass-fed finishing operation) result in negative net returns, although the grass-fed finishing operation, in isolation, is profitable (Larson et al., 2004 ; Forero et al., 2004). Labor hours per head for pastured cow/calf operations in Kansas decrease as herd size increases for each 40 head interval category, from less than 40 to more than 120 (Fogelman and Jones, 2003).

Poultry

Given the degree of consolidation in egg and broiler production, the prospects of pastured poultry lie in product differentiation. One of the best examples is discussed by Westgren (1999), who finds that poultry producers participating in the French “Label

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Rouge” green production and marketing system gain large premiums compared to their conventional counterparts.

Concluding Remarks on Production Issues

In general, pasture-based production systems entail relatively fewer animals units than their confinement counterparts. They face a disadvantage trying to compete in commodity markets, where slim margins require large volumes to earn a livable income. The success of these farms, therefore, depends on a combination of cost savings, price premiums and economies of scope.

Joel Salatin, a well-known advocate and practitioner of pasture-based agriculture, provides a long anecdotal analysis of the benefits of his multi-species rotational grazing operation. Salatin (1998) contends that this system provides a long list of economic virtues: low start up costs, low maintenance costs, high cash flow and size-neutral profit potential. Compared to a row crop/confinement model, Salatin (1998) claims his pasturing system uses smaller, less specialized and less expensive buildings; old buildings can be retrofitted and barns can be used to raise multiple species at the same time. This system requires no specialized and expensive machinery like grain harvesting combines; most machinery has multiple uses, and is therefore used more frequently (which makes each piece “pay for itself” more readily). Variable costs like seed, fertilizer and fuel are also reduced when grass, not grain, is grown. Veterinary bills are limited due to the overall health of his animals that get ample doses of fresh greens, exercise, fresh air and sunshine. Labor time and expense are low as well. The animals work for the farmer: the farmer need not harvest and transport forage or spread manure. Pigs can turn compost or till soil; chickens eat parasites of other species. In general, Salatin (1998) claims to have created a system that is versatile and flexible enough to ride out and survive the inevitable downturns in agricultural markets and farm fortunes. These claims have not been subjected to academic testing and investigation; such a study would be a valuable addition to our knowledge of pasture-based agriculture.

Processing Issues

One factor that all producers must deal with is the myriad of regulations related to processing meats. In general, there are three types of approved facilities (Born, 2000). Meat butchered in USDA approved facilities can be sold anywhere in the US. Frozen meats must be butchered, weighed, wrapped and labeled in USDA inspected facilities. Products from state-inspected plants can only be sold in state and are subject to that state’s regulations. Uninspected or “custom” butchers can only process for the owner’s use and must stamp “not for sale” on each package. Many stores and restaurants are likely to require USDA inspection, as are liability insurers (Born, 2000). Wholesale accounts are usually more comfortable buying USDA inspected meats (Becker, 2000).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Producers of pasture raised beef face a particular problem in the face of concerns over Bovine Spongiform Encephalopathy (BSE, or “Mad Cow” disease). Pastured beef cattle put on weight at a slower rate than grain-fed animals, often exceeding 30 months of age at slaughter. The USDA has determined “skull, brain, trigeminal ganglia, eyes, vertebral column, spinal cord and dorsal root ganglia of cattle 30 months of age or older... are specified risk materials,” (USDA FSIS (d), accessed August 2004) so particular care (saws dedicated strictly to older cattle, or isolation followed by sanitation) must be made when splitting the carcass. Any error is cause for shutting down and sterilizing the production line, causing costly delays. Older cattle are therefore less desirable and valuable; farmers can be held financially responsible for processor’s losses if older animals are mistakenly slaughtered without needed precautions.

Wisconsin’s Center for Integrated Agricultural Systems (CIAS) identifies finding off-farm or establishing on-farm butchering services as the biggest obstacle to pastured poultry. Producers often have to sift through a myriad of regulations to find what is applicable to them. Two types of exemptions exist for poultry producers, permitting slaughter of up to 20,000 birds annually (Hipp, 2001). Given the scarcity of processors (Brussell et al., 2000) that will deal with small volumes and the stress of moving animals around, the use of mobile processing plants is becoming of increased interest, especially for poultry. They often charge per bird fees plus mileage. The cost is often such that it is feasible for several small producers to buy together (North Central Region SARE, 1999).

Osborne and Bingen relate Michigan organic farmers’ difficulties in finding adequate local processing services: “all we have are big processing plants that don’t serve the needs of many growers,” (p.11). Organic meats and poultry must be processed in Federal slaughter plants that are certified organic (Smith et al., accessed August 2004).

Anecdotes from farmers and extension educators suggest that producers must schedule slaughter at least six weeks and as long as a year in advance. For small producers, competition with deer hunters for custom butchering services is a particular obstacle, given that hunting and the end of the production seasons overlap.

Marketing and Distribution:

Under vertical integration (ownership integration and contract integration), little or no marketing is done by producers. Under ownership integration, agribusiness firms like meat packers actually own and operate the farms. Farmers are employees of the firm. Under contracts, the farmer is independent of the processor and he or she usually supplies the labor, buildings, etc., while the agribusiness firm owns the animals, feed and other inputs. Much of the poultry egg and pork production is done under one of these arrangements (Martinez and Reed, 1996). Beef production is marked by distinct live stages: cow-calf, stocker and feeder (Hinrichs and Welsh, 2003). The first two stages are usually done by independent operators, who sell cattle to the highly concentrated feeder sector, who bring the animal up to slaughter weight. Fluid milk is

The Economics of Pasture Raised Animal Products: Food, Markets and Community

usually sold under a marketing contract, where the cows are owned and production is managed by the farmer (Hinrichs and Welsh, 2003).

The remaining animal products are currently marketed through two broad channels, the commodity (conventional) and alternative (niche) channels. Under the commodity channel, the farmer operates as a “price taker”: he or she sells the animal at the going rate, and has little or no influence on the price. The product is not differentiated from others in the mass market. According to Earles and Fanatico (2000), about half of the value of (commodity) beef is added after it leaves the farmer’s hands. They state that the marketing system, geared toward large, uniform lots, is not well-suited for smaller producers operating on individual bases. Niche marketing, usually involving some sort of direct market channel, comprises a tiny fraction of meat, dairy and egg sales.

The alternative or niche market strategy, while offering greater promise to small growers, poses difficulties as well. Born states that, like vegetables, directly marketing meat and animal products is difficult due to their high perishability; the long time lag involved with animal production (up to four years for beef) adds further difficulty, precluding rapid changes in product mix. Furthermore, consumers buying meat in bulk directly from producers often want lower prices, and producers bear the extra costs of order processing, delivery, etc. (Born, 2000). These and other services usually provided by “middle men” often add to the farmers’ workload and force them to work in areas they may find unfamiliar or uncomfortable. Finding slaughter and processing facilities that keep the individual farm’s meats separate and are willing to deal with small volumes poses another challenge (Born, 2000; Brussell et al.). Finally, saturation of the market can occur quickly: the easy customers are quickly located and their freezers soon fill up. Reaching and selling to consumers beyond this point takes a great deal of skill and effort (Born).

Eliminating the middle man can, of course, increase the price that the farmer gets for the product. Offering direct market sales can be either the core of the farm’s marketing strategies, or a supplementary source of income (Born, 2000). Grazing a mix of different animals can more efficiently use pasture resources (Born, 2000). Mikel (1998) lists a number of “infrastructure” requirements (processing capabilities, distribution avenues, market segments, cooperative arrangements, cash flow requirement), as well as personality traits (being a willing salesperson; ability to direct employees, handle rejection and deal with regulators) necessary for direct sales.

Klober (1998) reports that direct sales from farmers to restaurants can also be difficult. However, a survey of representatives from restaurant and food service firms in Texas (Tropp et al. 2004) lends many insights on how smaller scale meat producers can compete in this market. The chief competitive advantage smaller local processors have includes their proximity to the food service firms and ability to deliver fresher product and deliver more quickly. This advantage is especially important in securing accounts with independent (non-chain) firms, who tend to value freshness and quality more than chain restaurants (Tropp et al. 2004). Product quality, another possible selling point for

The Economics of Pasture Raised Animal Products: Food, Markets and Community

the small processor, ranks as the highest criterion for purchase decision making for both chain and non-chain firms. Non-chain firms, however, tend to value local products more highly, and require smaller quantities of free samples and shorter times to carry out internal and consumer tests on new meat items. It is important, Tropp et al. (2004) conclude, for small processors to demonstrate their ability and willingness to exceed buyer expectations of customer service, manage inventory, and customize the timing of deliveries and phone calls to meet customer preferences.

The preferred market channel seems to vary by product type. About 80% of the American Pastured Poultry Producers Association members cited direct marketing as their top sales method (APPA, accessed June 2004). Pirog (2004) found that a significant portion of consumers, especially those from rural areas, are interested in direct delivery of local dairy products. However, Dmitri and Richman (2002) find that 72% of natural livestock producers market through wholesalers, 8% through retailers and 20% through other channels. The challenges, they state, include gaining market access, obtaining price information and maintaining product uniqueness through labeling. Wheatley (2001) finds that price information is a major difficulty for natural pork producers. He cites other obstacles as well: producers linking with natural food distributors, mass market retailers' inability to buy natural foods from their regular supplier, the costs of building new relationships between agents and different expectations regarding levels of service. Grannis and Thilmany (2002) identify problems facing natural pork producers, from getting product onto grocery shelves to quality signaling; a natural meats section on grocery stores would address these issues. Dmitri and Richman (2002) report that organic foods' availability in regular supermarkets is an important criterion for consumer purchase.

Clearly, direct marketing has limited potential, especially for mid-sized farms; few consumers are likely to go out of their way to seek and buy products from these channels, and they require a great deal of marketing effort from the producer. Contract and spot markets also present dismal prospects for small and medium farms. Another alternative, such as the values-based value chain, is called for. What sorts of alternative models already exist and what can we learn from them?

One model that bears watching is the use of private label brands. Private labels often pay premium prices (compared to the commodity or contract market) for products; Niman Ranch, for example, pays a premium for hogs raised by certain standards, including no antibiotics or growth promoters, no animal products in feed, and compliance with animal husbandry standards (access to bedding, no gestation crates) certified by the Animal Welfare Institute. Niman Ranch puts great effort into marketing the "ends" of hogs (e.g., shoulders, bacon) and getting a premium price that can be passed on to producers. Each animal is tagged to preserve its identity throughout the supply chain. They work with over 300 family farmers to sell pork, beef and lamb⁴. Another private label in North America is Du Breton Farms from Quebec.

⁴ Information about Niman Ranch comes from their website, www.nimanranch.com, and from personal correspondence with one of their Michigan representatives, Andrew Pachay.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Other models include cooperatives or other farmer-led organizations. The most prominent example is Organic Valley, which sells organic dairy, meat and produce nationwide.⁵ Oregon Country Beef is a cooperative of that sells natural beef products through partnerships with natural foods grocers and restaurants.⁶ Patchwork of Family Farms in Missouri sells pastured pork products from 15 family farms.⁷

Without an abundance of functioning value chains to evaluate, it is difficult to provide much detail concerning lessons learned about how these mechanisms work, what has led to successes or failures, what areas pose the greatest opportunities or threats, etc. Much of what is known comes from similar initiatives in Europe and their use of so-called alternative or short food supply chains. Marsden et al. (2000) say that the literature is large but fragmented and untheorized.

These short or alternative supply chains have arisen in part to address the shortcomings of the “productivist” rural development paradigm which is based on commodity production. Verhaegen and Van Huylenbroeck (2001) state that increases in traditionally defined productivity and efficiency will result in a reduction in agricultural population and diversity of available commodities, as well as environmental and fiscal budgetary problems. Traditional commodity production has also brought a decreasing percentage of the overall value of food products to farmers (Renting et al., 2003). The proposed solution is place-based or “endogenous” (Ilberry et al., 2004) development based on a new paradigm in which food products are differentiated by a food quality criteria, delivered by these short or alternative supply chains. This paradigm re-establishes the farm as the central focus, exploiting economies of scope and synergy through new associations that create a favorable social infrastructure (Ilberry et al., 2004). These alternative chains “short circuit” the long anonymous industrial supply chains by re-embedding food in a geographical and social context ((Renting et al. 2003).). Citing results from eight empirical studies, Ploeg and Renting (2004) conclude that farm based rural development raises income levels on farms and in the wider economy.

The alternative food chains (AFCs) result from active construction of networks by various participants: farmers, processors, wholesale, retail and consumers (Marsden et al. 2000). They provide and eat food that retains a great deal of information about the values inherent to how or where it was produced. The more embedded (socially and geographically) the food is, Marsden et al. (2000) argue, the more scarce (differentiated) and therefore the more valuable it will be in the marketplace. AFCs are also characterized by transparency (Renting et al. 2003) and close relationships (Marsden et al. 2000) between actors in the chain. The “values” information is conveyed by a number of ways, from face to face market channels to labels and point of purchase materials (Renting et al. 2003), the latter often involving a set of conventions, codes and

⁵ <http://www.organicvalley.coop/>

⁶ See the case study on Oregon Country Beef at http://www.agofthemiddle.org/pubs/ocb_case.pdf

⁷ <http://www.patchworkfamilyfarms.org/index.html>

The Economics of Pasture Raised Animal Products: Food, Markets and Community

mediators such as third party verifiers (Renting et al. 2003). Most AFCs are defined as representing either a geographic area, biophysical production method (e.g., organic, free range, etc.) or a hybrid of the two (Renting et al. 2003). They address consumers' desire for "good food" (Sage, 2002): authentic; derivative of a certain place or process; produced with regard to sustainability, naturalness and animal welfare; nutritious and good to eat.

Renting et al. (2003) state that AFCs are particularly well-suited to (and most commonly used by) mid-sized farms: some minimum level of production is needed for viability and to afford investment, but large volumes are usually at odds with the chains' processing and marketing structures. Van Donkersgoed (accessed 2004) touts the degree of partnership, how farmers are truly involved in decision making, as well as the trust and the way value chains "apply market knowledge to develop storied food that brings consumers back, again and again." Whatmore et al. (2003) define them as "food markets that redistribute value through the network against the logic of bulk commodity production; that reconvene 'trust' between food producers and consumers; and that articulate new forms of political association and market governance" (p.389).

Verhaegen and Van Huylenbroeck (2001) discuss the costs and benefits these AFCs bring to farms. In a study of six AFCs in Belgium they found that farm revenues increased as prices and margins improved while quantities sold held steady. Another benefit was a decrease in uncertainty, as the chains offered guaranteed prices that reflected production costs.

The costs to farms using AFCs are more varied and harder to quantify. Verhaegen and Van Huylenbroeck (2001) break down costs into two main categories: direct and transaction costs. Direct costs are incurred if farms must change their biophysical practices; those already using these methods incur no new costs. Other direct costs include getting the product to market. These were roughly unchanged in Verhaegen and Van Huylenbroeck's (2001) study. Transaction costs are inherent to setting up a new market. These costs must be paid for by someone, although farmers tend to only recognize private transaction costs and base their decision to participate by comparing these with the benefits. Chain wide transaction costs were either paid for by increasing the final consumer price, or by charging participation fees.

Transaction costs include information, negotiation and control costs. These were often covered by a membership fee or capital contributions by farms. AFCs were generally able to acquire and disseminate information about market condition in an efficient way, and prevent free riding on this information by restricting access. Negotiation costs, including the time spent at meetings, were often overlooked by the farmers; farmers who were able to substitute low cost hired farm labor for their own production labor (to attend meetings) were able to minimize these costs. Control costs included actions to protect the brand, restrict participation in the chain, or verification of compliance with standards i.e., (to detect and sanction rule breakers).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Overall, Verhaegen and Van Huylenbroeck (2001) found that AFCs were successful in:

- increasing farmers' margins
- decreasing price risk
- promoting innovations
- investing in acquiring specific knowledge, assets and skills
- bundling capacities and resources
- ensuring quality
- creating market incentives for sustainability.

AFCs role in quality control is echoed by Marsden et al. (2000) , who quote an actor in one chain as citing a direct relationship between the quality of actor relationships and the quality of product.

Several studies mention caveats and threats. Caveats include possible lack of demand for these products and lack of institutional support (Renting et al. 2003), the small size and numbers of producers, restrictive regulations, shortfall of key intermediaries (especially processors) and poor rural infrastructure (Ilberry et al., 2004). Renting et al. (2003) note that consumers often have contradictory preferences for quality/naturalness and convenience/low price. Other threats include: appropriation by agribusiness and the threat of downward pressure on prices and dilution of standards; competition from inferior products with similar characteristics (Renting et al. 2003). Murdoch et al. (2000) warn that AFCs may be doomed to niche status if they ignore the commercial (price and commercial quality) and industrial (efficiency and reliability) conventions of production networks. Over-emphasis on spatial proximity “can lead to ‘fetishing’ of localness and a downplaying of more universal factors which are necessary for the acquisition of competitive advantage” (Murdoch et al.(2000) p.117) and “all too easily fall out of favor with health conscious and ecologically concerned consumers” (p.119).

Westgren (1999) gives a detailed picture of the operations of one successful channel, the Label Rouge for poultry products in France. The business activity is organized by a quality group (heretofore, “group”), which is typically a collection of producers, perhaps associated with hatcheries, feed mills, abattoirs, etc. The group must first apply to the CNLC, the national commission of labels and quality certifications, by submitting a “cahier des charges”, a business plan that details every step of the proposed supply chain. In it, the group designates an “organisme certificateur” (OC) which oversees the group’s quality and safety performance. A government agency COFRAC accredits the certifier (OC) which certifies the group (presumably for a fee). COFRAC has the right to close down any OC that does not adequately perform its duties. If the CNLC finds the cahier complete, it permits the use of the Label on specific products within specific regions. Once established and accredited, the group becomes a member of SYNALAF, the national syndicate of poultry labels, and is required to provide money that funds promotion of and education about Label products.

Hatcheries, grain mills, farmers and processors are associated into “filieres”, strategic and operational alliances (Westgren, 1999). The quality group is at the center of the filieres. These filieres may be marked by tight affiliations like ownership of upstream or

The Economics of Pasture Raised Animal Products: Food, Markets and Community

downstream assets, or loose ones like shared decision making between links in the chain or simple contractual agreements.

When one party in a filiere fails to uphold the required quality and food safety standards, the birds are not able to be sold with the Label. This results in a significant loss of price premium, for which the offending party must often compensate other filiere members. This results in strong internal controls along the supply chain, covering traceability, capacity and codified production practices (Westgren (1999)).

Murdoch et al. (2000) offer keys to another success story, which began as an organic farm in Wales, expanded into the on-farm processing of yogurt, opened a farm shop, then established a supply relationship with a large supermarket. As sales expanded this firm increased plant capacity, increased the number of products offered and began sourcing local milk. Today, it distributes products throughout the UK through several large distributors and supermarket chains. Murdoch et al. (2000) identify four keys to success: quality product, commitment to upgrade and expand production, a strong brand image, high public stature of the product. This strategy of combining values-based with commercial and industrial qualities resulted in growth of the market for quality organic yogurt and successful penetration into broader markets (Murdoch et al., 2000).

Community Impacts

As the number of farms and farmers have decreased, small towns in the north central region and throughout the nation have experienced a decrease in commercial activities, lower revenues for input suppliers and output buyers, diminished service and retail sectors, (Heady, 1975; Ginder et al., 1985) leading to “decaying rural communities” (Heady, 1975, p.7). Community well-being also suffers, through deterioration of social life, loss of young leaders, and declining tax revenues for schools and health and social services due to the loss of farms and farm families (Heffernan and Heffernan, 1986). Individuals have suffered from greater depression, substance abuse, mental illness and an increased reliance on food stamps, Medicaid, etc.(Heffernan and Heffernan, 1986).

Research has identified impacts of farm and business structure on communities. Ikerd (1994) argues that independently owned hog farms make greater contributions to rural economic development than contract farms. Small and mid-sized farms often contribute more to local economies and communities than larger farms. Chism and Levins (1994) find that smaller livestock farms buy more of their inputs locally, as do Abeles-Allison and Connor (1990), and Foltz et al. (2002). Other studies (Lawrence et al. (1997), Marousek, 1979)) find that smaller farms are more likely to buy locally. In a notable exception, Korsching (1984), found that all sizes of farms spend the majority of money in the farms’ small local trading area. This study, from three Iowa watersheds using 1977-1979 farm data, notes that the family farm was the “predominant farm organization,” (p.238). Foltz and Zeuli (2004) also found no relationship between farm size and purchase patterns; they state that local supply of needed goods and farmers’

The Economics of Pasture Raised Animal Products: Food, Markets and Community

attachment to community are more important determinants than farm size. This may indicate that the growth of an existing farm would provide greater local economic impact than an imported farm of the same scale.

One possible explanation for the inverse relationship between farm size and local purchases is as follows. Farms face a choice between buying relatively small amounts at slightly higher costs from local suppliers versus buying large volumes wholesale or factory direct,. It becomes a tradeoff between travel costs and volume discounts. For a smaller farm with a smaller purchase, the cost of transport from distant suppliers can not be justified by the small per unit discount, as this single buyer bears all of the transport costs; the cost is especially high when the order is a fraction of a truck's capacity. (The unit cost of transport is higher for a half-full truck than a full one). Buying from a local supplier, who gains the quantity discount by buying in bulk but spreads the trucking cost over several small orders, makes sense for smaller farms. In contrast, large farms with large orders, can justify the transport cost because they are receiving the volume discount on a large number of units. While this explanation is plausible, it needs testing through more research to verify this and other reasons for the link between farm size and local purchases.

The notion that locally owned and operated farms and entrepreneurial middle classes are an indicator of healthy communities may be explained as follows. Corporations typically locate in a given area for one reason: because they believe this is where they will achieve maximum profits. Their duty, therefore, is to typically pay the lowest wages that attract an adequate labor supply and use whatever production methods result in highest profit, regardless of environmental or social impact. Officers that do otherwise risk being fired or even sued by shareholders for failure to uphold their fiduciary responsibilities. Often the decision makers for such firms live far way from the impacts of their business. In contrast, family farmers, for example, generally have deep ties to the community. Often they have lived in an area for many generations, have relied on informal networks of reciprocity and feel a shared destiny with the area and their neighbors. Furthermore, while corporate earnings go to investors often living far away, profits from family farms and locally-owned businesses largely stay in the community, are spent in local retail shops and invested in local banks. While these depictions of heedless corporation and the altruistic family farmers are stereotypes or typologies, they do present possible explanations that should be researched further.

DeLind (1998) tells the story of large confinement hog farm in rural Michigan. It was established with a promise of providing jobs and buying locally grown corn, DeLind (1998) says, but filled these needs from out of state sources while driving out established local businesses and causing a collapse of property values. Similarly, Ikerd (1998) finds that large scale investment in industrialized hog operations displaces about three times as many jobs as it creates.

The relationship between farm size and structure, and rural community well-being, has been explored since Goldschmidt's (1947) famous findings: communities with fewer,

The Economics of Pasture Raised Animal Products: Food, Markets and Community

smaller operator-owned farms score have healthier societies than otherwise similar towns dominated by a few large farms that rely on hired labor. Several subsequent studies (Lobao (1990); Welsh and Lyson (2001); MacCannell (1988); Durrenberger and Thu (1996); Lyson, et al. (2001)) have replicated and confirmed the “Goldschmidt Hypothesis.” Specifically, Welsh and Lyson (2001) find that anti-corporate farming laws tend to be beneficial to agriculture dependent counties. While some degree of industrialization is beneficial, they argue, communities suffer when industrialized farms dominate and crowd out less industrialized farms. Lyson et al. (2001) determine that while farm scale is somewhat important in determining community well-being, an engaged civic community and independent middle class are vital. Durrenberger and Thu (1996) find correlations between fewer numbers of farms and farmers (which in turn are determined by farm size) and community economic well-being. Calling small to mid-sized farms the “keys to rural economic health,” (p.413), they conclude that “the industrialization of agriculture as expressed in the growth of large scale farms results in measurable declines in economic well-being,” (p.414), and that Iowa needs more farmers, not necessarily more hogs. MacCannell’s (1988) study of four Sun Belt states (TX, CA, AZ, FL) found “evidence for substantial deterioration of human communities and living conditions associated with new form (advanced industrial type) of agriculture” (p.15). MacCannell (1988) described the relationship between farm size and community well-being as an inverted J-curve, with community well being unchanged or slightly improving up to about 300 acres, then declining beyond that. He concludes that “it is in exactly those areas where farming is the most modern, rational and economically profitable that the worst general social conditions are found” (p.17). Gomez and Zhang (2000) use econometric modeling to show that large hog farms and the concentration of hog production have had negative impacts on rural communities in Illinois. Many of the studies that have found no such relationship (e.g., Buttel et al., 1988) were done twenty or more years ago, in areas such as the Northeast that are not highly dependent on agriculture, and/or in areas and at times when family farms were still the predominant agricultural unit. While the relationship between farm size and community may not hold at all times in all places under all circumstances, there is certainly ample evidence that small to mid-sized owner-operated farms, as part of an independent middle class, are a vital ingredient to healthy communities in rural areas.

Analysis: Opportunities, Threats and Research Needs

Pastured production of animals holds great opportunities for farmers, consumers and rural communities. The research detailed above implies pasturing is a management strategy that is accessible to new or transitioning farmers and can produce food that is priced competitively with the row crop-confinement model. Consumers support farms that contribute to their vision of a food system based on social, environmental and economic justice; these are values for which many state their willingness to pay a premium. Communities gain by having the entrepreneurial middle class of farms and the ancillary businesses they support.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Small farms are doing a good job at finding innovative direct marketing opportunities to gain a large share of the value added to meat, dairy and egg production. While there is still opportunity to increase demand at that level through communication with and education of consumers, this is a limited market. Only a relatively small percentage of people are likely to seek out these products at locations outside of their habitual shopping places.

On the other hand, it is the mid-sized farms that are being squeezed out of the market. They have the volume to supply mainstream outlets' latent demand, and the kind of values that consumers are willing to support with higher prices. It seems to be largely a matter of coordination, and designing and testing the proper marketing channels. Values-based value chains, and similar partnerships between participants in the supply chain that maintain the identity and communicate the values of the actors, hold particular promise for mid-sized farms. Creating these chains, however, is difficult: it requires great time and effort to line up potential participants, and negotiate agreements. It also requires trust to share economic data to guide the formation of agreements. Farmers often dislike being marketers, preferring the ease of delivering animals to stockyards even at lower prices. Value chains require a catalyst to initiate and lead the process (Agriculture and Food Council, accessed August 2004); it is difficult for small independent business people to do so. A coalition of public and private interests is needed to learn how best to create and sustain value chains, then seek, recognize and act upon opportunities.

No such efforts can succeed without recognizing the threats. First, the true level of demand is unknown. Most studies use hypothetical methods to measure willingness to pay, probable behavior. As the saying goes, "ask a hypothetical question, get a hypothetical answer." That is, what people say they will or will not do in a survey does not always reflect their actions in real transactions. Surveys are particularly prone to this. If anything, they will overestimate demand because the respondent will want to please the researchers, tell them what they want to hear. Demand is also constrained by perceptions, correct or not, that pastured meat tastes "grassy" or "gamey," and that older animals' meat is tough.

The aging of the farm population and loss of farmland can be seen as a grave risk to our food system and food security in general. The human capital loss when farmers retire and sell their land is great. Land turned to pavement or buildings is difficult to turn back to farmland. Loss of mid-sized farms and farmers pose a unique threat to the diversity and viability of our agricultural system.

Until the mechanisms are actually in place and agreements between participants reached, one cannot guarantee that values-based value chains will work. The prices may be too high or the quantities too small to work. Values-based value chains involving multiple small to medium sized farms face many hurdles such as coordination of annual supply, lack of consistency of product, costs of compliance with environmental regulations, etc. Participants may have too much mistrust, see it as too great a risk or

The Economics of Pasture Raised Animal Products: Food, Markets and Community

generally dislike or be suspicious of cooperation. Critical links, particularly USDA licensed processors, may be missing. Farmers run the risk of ramping up production to meet new accounts, only to see these accounts lost or diminish as prices, consumer tastes or managers/buyers change.

Even if successful value chains are established, they may become victims of their own success. They would be particularly prone to co-option and “green washing” by others with vast resources and great motivation to blur the distinction between products and offer lower priced products with lower standards that compete with value chains.

Finally, any system that attempts to internalize costs and pay a fair value to all actors will go against our national cheap food paradigm. Like organics, health foods, etc., value chain foods could become one more component of our two-tiered food system: one for elites and one for the poor. We believe values-based value chains should become the dominant model, not relegated to “yuppy chow”.

Many of these opportunities can be realized and threats addressed by research, extension and policy efforts. Foremost, more research informed by practice needs to be focused on values-based value chains. Topics include feasibility, logistics, governance and basic “how to.” More demand analysis is needed for pastured meats; studies using combinations of survey and experimental methods (such as those used by Loureiro et al.(2003) ; Conner and Christy (2004) ; and Fox et al., (1998)) would help overcome the “hypothetical answer” issue.

Farmers need better tools to measure costs and to price their products, enterprise budgeting tools that account for the cross year nature of animal production, and decision-making tools to guide which costs (transport, processing) to absorb versus pass on to customers. Farmers also need better marketing training, such as the peculiarities of the meat market and on making decisions, such as tradeoffs between short term gains from market condition change versus the value of a more reliable market.

More research is also needed to measure the impacts and links between, on one hand, production systems (e.g., pasture versus confinement/row crop versus hybrids using aspects of the two systems), farm industry structure and market arrangements, and on the other hand, community social, ecological and economic well-being. Such research is vital if consumers and policy makers are to make informed decisions about the nature of our food system and rural communities.

Conclusions

This review of literature and anecdotes demonstrates that many consumers want and are willing to pay for pastured and other natural animal products, and that these products can be produced at competitive prices even on small scales. Utilizing pasture management offers a vital survival strategy for disappearing mid-sized farms.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Connecting these producers and consumers offers wide social economic, ecological and health benefits. The values-based value chain- a partnership between links in the supply chain that shares risks and information, provides stable markets and transmits value-laden information about process attributes to consumers-is a model that holds great promise and deserves increased attention from scholars, policy makers and community developers. Many obstacles still exist, however, before these connections can be made. Access to affordable USDA certified processing remains limited, especially to smaller producers; scale constraints and the higher transaction costs involved with dealing with multiple smaller accounts, are difficulties that need creative solutions.

The discussion in the previous section gives a few suggestions for future research needs. More input is needed from participants in all parts of the market chain; conversations involving participants are needed to generate partnerships, research agendas and policy recommendations. This paper is intended as a first step in collecting our baseline of knowledge and creating a starting point for future work and discussion.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

References

- Abeles-Allison, M. and Connor, L. (1990). *An Analysis of Local Benefits and Costs of Michigan Hog Operations Experiencing Environmental Conflicts*. Michigan State University Extension Ag Econ Bulletins, Report 536. East Lansing, MI.
<http://www.msue.msu.edu/msue/imp/modae/53609801.html>
- Agriculture and Food Council. (2002). *Value Chain Handbook*. Agriculture and Food Council of Alberta, Agriculture and Agri-food Canada, Alberta Agriculture, Food and Rural Development.
<http://www.agfoodcouncil.com/serve/chainbook.pdf>
- Antle, J. (1999). The New Economics of Agriculture. *American Journal of Agricultural Economics* 81 (5) 993-1010
- Antle, J. (2000). No Such Thing as a Free Safe Lunch: The Cost of Food Safety Regulation in the Meat Industry. *American Journal of Agricultural Economics* 82 (2) 310-322.
- APPA. American Pastured Poultry Producers Association. Accessed June 2004.
<http://www.appa.org/APPPA/articles/marketing1.htm>
- Armah, P. and Kennedy, D. (2000) Identification of Market Potential for Pasture-Raised Pork in the Mississippi Delta of Arkansas-1998. *Journal of Food Distribution Research*, Vol. 31, No. 1, March 2000, (89-97.)
- Barkema, A. and Cook, . (1993). The Changing U.S. Pork Industry: A Dilemma for Public Policy. *Federal Reserve Bank of Kansas City Economic Review* 78, (2) (2nd Quarter 1993): 49-65.
- Born, H. (2000). Alternative Meat Marketing. ATTRA Livestock Technical Note. May, 2000. <http://attra.ncat.org/attra-pub/PDF/Altmeat.pdf> (accessed August 2004).
- Brussell, J., Samy, M. and Swanson, B. (2000). Specialty Livestock Processing in Illinois. Department of Agricultural and Consumer Economics, College of Agriculture, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign. AER-4737, August 2000.
- Buttel, F., Lancelle, M.; Lee, D. (1988) Farm structure and rural communities in the northeast. In Swanson, L.E. (ed.) *Agriculture and Community Change in the U.S.: The Congressional Research Reports*, pp. 181-237. Westview Press, Boulder, CO.
- Caswell, J. (1998). How Labeling of Safety and Process Attributes Affects Markets for Food. *Agricultural and Resource Economics Review*, 27 (2) 151-157.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Center for Integrated Agricultural Systems. *Research Brief #46: Pastured Poultry Study Addresses Broad Range of Issues.*

http://www.cias.wisc.edu/archives/1999/12/02/pastured_poultry_study_addresses_broad_range_of_issues/index.php. (accessed August 2004).

Chism, J. and Levins, R. (1994). Farm Spending and Local Selling: How Do They Match Up? *Minnesota Agricultural Economist* No. 676

Conner, D. (2004). Expressing Values in Agricultural Markets: an Economic Policy Perspective. *Agriculture and Human Values* 21, (1) 27-35.

Conner, D. and Christy, R. (2004). The Organic Label: How to Reconcile its Meaning with Consumer Preferences. *Journal of Food Distribution Research* 35 (1) 40-43.

Consumers Union: Guide to Environmental Labels. <http://www.eco-labels.org> (accessed August 2004).

Crabtree, J. *An Alternative Vision for Pork Production*. Center for Rural Affairs. <http://www.ctic.purdue.edu/core4/nutrient/manuremgmt/Paper30.html> (accessed August 2004).

CIAS. Center for Integrated Agricultural Systems. Raising Poultry on Pasture. *Research Brief #57*. <http://www.wisc.edu/cias/pubs/briefs/057.html>

Dartt, B., Lloyd, J., Radke, B., Black, J. and Kaneene, J. (1999). A comparison of profitability and economic efficiencies between management-intensive grazing and conventionally managed dairies in Michigan. *Journal of Dairy Science*. 82:2412–2420.

DeLind, L. (1998). Parma: A Story of Hog Hotels and Local Resistance. In Thu, K. and Durrenberger, E., Editors, *Pigs Profits and Rural Communities*. State University of New York Press, Albany.

Dmitri, C. and Richman, N. (2002) *Organic Food Markets in Transition*, Policy Studies Report No. 14, Henry A. Wallace Center for Agricultural and Environmental Policy, April 2000.

Doering, C. (2004). Retailers, Consumers Want Organic Beef. Reuters News Service, July 5, 2004. Accessed at <http://www.planetark.org/dailynewsstory.cfm/newsid/25849/story.htm>

Duffy, M. (1998). *How Small Farms Compete*. USDA Agricultural Outlook Forum. February 23, 1998. <http://www.extension.iastate.edu/bfc/pubs/compete.html>

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Durrenberger, E. and Thu, K. (1996). The Expansion of Large Scale Hog Farming in Iowa: the Applicability of Goldschmidt's Findings Fifty Years Later. *Human Organization* 55 (4) 409-415.

Earles, R. and Fanatico, A. (2000). *Alternative Beef Marketing*. ATTRA Livestock Technical Note. May 2000. <http://attra.ncat.org/attra-pub/PDF/altbeef.pdf> (accessed August 2004).

Featherstone, A., Langemeier, M. and M. Ismet, (1997). A Nonparametric Efficiency Analysis For A Sample of Kansas Beef Cow Farms. *Journal of Agricultural and Applied Economics* 29:175-184.

Fogelman, S. and Jones, R. (2003). Beef Cow-Calf Enterprise. Farm Management Guide, MF-266. Department of Agricultural Economics, Kansas State University. <http://www.oznet.ksu.edu/library/agec2/mf266.pdf> (accessed August 2004).

Foltz, J. and Lang, G. (2001). *The Adoption and Impact of Management Intensive Rotational Grazing (MIRG) on Connecticut Dairy Farms*. <http://www.aae.wisc.edu/foltz/Graze.pdf>

Foltz, J. Jackson-Smith, D., Chen, L. (2002). "Do Purchasing Patterns Differ Between Large and Small Dairy Farms: Econometric Evidence From Three Wisconsin Communities." *Agricultural and Resource Economic Review* 31 (Spring 2002) 28-38.

Foltz, J. and Zeuli, K. (2004). *Challenging the Goldschmidt Theory of Rural Purchasing Patterns*. Agriculture and Applied Economics Staff Paper Number 475. University of Wisconsin-Madison.

Food Processing Center, University of Nebraska. (2001). *Attracting Customers With Locally Grown Products*. Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. http://www.foodmap.unl.edu/report_files/Locally_Grown_Consumer_Survey_Report.pdf (accessed August 2004).

Food Routes Network. *Report on Building Support for Buying Local*. Greenberg Quinlan Rosner Research, Inc. <http://www.foodroutes.org/BuildingSupport.pdf> (accessed October 2005)

Forero, L., Nader, G., Klonsky, K., Livingston, P. and De Moura, R. (2004). Sample Costs for Beef Cattle Cow-Calf Production, 300 Head, Sacramento Valley. University of California Cooperative Extension. BF-SV-04. <http://coststudies.ucdavis.edu/cost-studies/BeefCowCalfSV2004.pdf> (accessed August 2004).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

- Fox, J., Shogren, J. ; Hayes, D. and Kliebenstein, J. (1998). CVM-X: Calibrating contingent values with experimental auction markets. *American Journal of Agricultural Economics* 80 (3) 455-465.
- Gegner, L. (2004). *Pork: Marketing Alternatives*. ATTRA Marketing and Livestock Guide (April 2004). <http://attra.ncat.org/attra-pub/PDF/altpork.pdf> (accessed August 2004).
- Ginder, R. (1998). "Alternative Models for the Future of Pork Production." In Royer, J. and Rogers, R, editors, *The Industrialization of Agriculture: Vertical Coordination in the U.S. Food Industry*. Ashgate Publishing, Brookfield, VT.
- Ginder, R., Stone, K. and Otto, D. (1985). Impact of the Farm Financial Crisis on Agribusiness and Rural Communities. *American Journal of Agricultural Economics* 65 (5), 1184-1190.
- Gloy, B. Tauer, L. and Knoblauch, C. (2002). Profitability of Grazing Versus Mechanical Forage Harvesting on New York Dairy Farms. *Journal of Dairy Science* 85: 2215-2222.
- Goldschmidt, W. (1947). *As You Sow*. Harcourt Brace, New York
- Gomez, M. and Zhang, L. (2000). *Impacts of Concentration in Hog Production on Economic Growth in Rural Illinois: An Econometric Analysis*. Presented to the American Agricultural Economics Association annual meetings in Tampa, FL, July 31-August 2, 2000.
- Goodman, D. (2004). Rural Europe redux? Reflections on Alternative Agro-Food Networks and Paradigm Changes. *Sociologia Ruralis* 44 (1) 3-16.
- Grannis J. and D.D. Thilmany, (2002) "Marketing Natural Pork: An Empirical Analysis of Mountain Region Consumers." *Agribusiness*, 18 (4) 475-489.
- Heady, E. (1975), The basic equity problem. In Heady, E. and Whiting, L. eds. *Externalities in the Transformation of Agriculture*. Iowa State University Press. Ames, IA.
- Heffernan, W. (1998). *Consolidation in the Food and Agriculture System*. Report to the National Farmers Union
- Heffernan, W. and Heffernan, J. (1986). Impact of the Farm Crisis on Rural Families and Communities. *The Rural Sociologist*, 6 (3), 160-170.
- Hendrickson, M., Heffernan, H., Howard, P. and Heffernan, J. (2001). Consolidation in Food Retailing and Dairy. *British Food Journal* 103 (10) 715-728.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Hinrichs, C. and Welsh, R. (2003). The effects of the industrialization of US livestock agriculture on promoting sustainable production practices. *Agriculture and Human Values* 20 (2) 125-141.

Hipp, J. (2001). Legal Issues For Small-Scale Poultry Processors Federal and State Inspection Requirements For On-Farm Poultry Production and Processing. APPA. American Pastured Poultry Producers Association, December, 2001. <http://appa.org/legalintro.pdf> (accessed October, 2005).

Honeyman, M.S., "Swine System Option for Iowa," *Outdoor pig production: an approach that works*, Leopold Center for Sustainable Agriculture, May 1996.

Honeyman, M.S., "Sustainable Swine Production in the U.S. Corn Belt," *American Journal of Alternative Agriculture*, Vol. 6, No. 2, 1991, pp. 63-70.

Hurley and Kliebenstein (1998) *A Final Report Prepared for the Leopold Center for Sustainable Agriculture*. Nov. 30, 1998, Leopold Center for Sustainable Agriculture.

Hurt, C. (1994). Industrialization in the pork industry," *Choices*, 9, (4, Fourth Quarter 1994), pp. 9-13.

Ikerd, J. *The Economic Impacts of Increased Contract Swine Production in Missouri: Another Viewpoint*. Sustainable Agriculture Systems Program, University of Missouri. <http://www.ssu.missouri.edu/faculty/jikerd/papers/con-hog.htm>

Ikerd, J. (1998). Sustainable Agriculture, Rural Economic Development and Large-Scale Swine Production. In Thu, K. and Durrenberger, E., Editors, *Pigs Profits and Rural Communities*. State University of New York Press, Albany.

Ilberry, B., Maye, D., Kneafsey, M., Jenkins, J. and Walkley, C. (2004). Forecasting Food Supply Chain Development in Lagging Rural Regions: Evidence from the UK. *Journal of Rural Studies* 20(2004) 331-344.

Johnson, T. (2002). *The Economic of Grass Fed Dairy*. ATTRA Livestock Business Guide. <http://attra.ncat.org/attra-pub/PDF/ecodairy.pdf>

Kerr Center for Sustainable Agriculture (2001). Study of Consumer Perceptions of All Natural Beef products. Funded by the Kerr Center for Sustainable Agriculture. Research conducted by Diel and Associates, Perkins OK. http://www.kerrcenter.com/publications/beef_survey/consumer_survey.pdf (accessed August 2004).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Kevin, K. (2004). Meat Market Maxed. *Advantage Magazine*. Food Marketing Institute. <http://www.fmi.org/advantage/issues/052004/pdfs/pub/meatmarketmaxed.pdf> (accessed August 2004).

Kilpatrick, J.(2001). Concentrated Animal Feeding Operations and Proximate Property Values. *Journal of Assessment* 69 (3) 301-306.

Klober, K. (1998). Approaches to Marketing - Notes from a Direct Marketing Survivor. *Small Farms Today* (October/November 1998). 48-51.

Korsching, P. (1984). Farm Structural Characteristics and Proximity of Locations of Goods and Services. In *Research in Rural Sociology and Rural Development, Volume 1*. Schwarzeller, H., Editor. Jai Press, Greenwich, CT.

Kriegl, T. and Frank, G. (2004). An Eight Year Economic Look at Wisconsin Dairy Systems. University of Wisconsin Center for Dairy Profitability. <http://cdp.wisc.edu/pdf/Eight%20Yr%20COP%2021c13.pdf> (accessed August 2004).

Lamb, R. and Beshear, M. (1998). From the Plains to the Plate: Can the Beef Industry Regain Market Share? *Economic Review* (Federal Reserve Bank of Kansas City) Third Quarter 1998, 1-18. <http://www.kc.frb.org/publicat/econrev/PDF/4q98lamb.pdf>

Langemeier, M.. and T. Schroeder. "Economies of Size for Farrow-To-Finish Hog Production in Kansas," *Swine Day* (1993).

Larson, S., Thompson, C., Kolnsky, K. and Livingston, P. (2004). *Sample Costs for a Cow-Calf/Grassfed Beef Operation. 200 Head Cowherd with 30 Grassfed Cattle in North Coast Region, Sonoma and Marin Counties*. University of California Cooperative Extension. BF-NC-04. <http://coststudies.ucdavis.edu/cost-studies/BeefGFNC2004.pdf> (accessed August 2004).

Lawrence, J., Otto, D. and Meyer, S. (1997). Purchasing Patterns of Hog Producers: Implications for Rural Agribusiness. *Journal of Agribusiness* 15 (1), 1-18

Lobao, L. (1990). Locality and Inequality. Farm Structure and Socioeconomic Conditions. State University of New York Press, Albany.

Loureiro, M., McCluskey, J. and Mittelhammer,R. (2003). Are Stated Preferences Good Predictors of Market Behavior? *Land Economics* 79 (1) 44-55.

Lyson, T. (2000). Moving Toward Civic Agriculture. *Choices* 15 (3) 42-45.

Lyson, T., Torres, R. and Welsh, R. (2001). Scale of Agricultural Production, Civic Engagement and Community Welfare. *Social Forces*, 80 (1) 311-327.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

MacCannell, D. (1988). Industrial agriculture and rural community degradation. In Swanson, L.E. (ed.) *Agriculture and Community Change in the U.S.: The Congressional Research Reports*. pp.15-75, 325-355. Westview Press, Boulder, CO.

Marshfield News Herald. (2003). Organic Dairy farms Thrive. By Allen Hicks. Dec. 9. 2003. <http://www.wisinfo.com/newsherald/mnhlocal/279301772601962.shtml> (accessed August 2004).

Martinez, S. and Reed, A. (1999) *From Farmers to Consumers: Vertical Coordination in the Food Industry*. USDAS ERS Bulletin 720

MacDonald, J., Ollinger, M., Nelson, K. and Handy, C. (2000). *Consolidation in U.S. Meatpacking*. Food and Rural Economics Division, Economics Research Service, U.S. Department of Agriculture. Agricultural Economic Report number 785. <http://www.ers.usda.gov/publications/aer785/aer785.pdf> (accessed August 2004).

Marousek, G. 1979. Farm Size and Rural Communities: Some Economic Relationships. *Southern Journal of Agricultural Economics* 11 (2) 57-61.

Marsden, T., Banks, J. and Bristow, G. (2000). Food Supply Chain Approaches: Exploring their Role in Rural Development. *Sociologia Ruralis* 40 (4) 424-438.

Mikel, W. (1998). *Direct Marketing of Meat Products*. National Pork Board, Des Moines, IA. <http://www.porkscience.org/documents/Other/Q-FACTS-DIRECT%20MARKETING.pdf> (accessed August 2004).

Moore, R. and Herndon, C. (accessed August 2004). Labor Requirements and Costs of Handling Dairy Wastes. Mississippi State University Extension Service. <http://msucares.com/pubs/infosheets/is1588.htm> (accessed August 2004).

Morrison, C. (1997). Economic Performance, Cost Economies and Pricing Behaviour in the US and Australian Meat Products Industries. *Australian Journal of Agricultural and Resource Economics* 41 (3)361-83

Mueller, A. (1993). Economies of Size in Hog Production: Is Size Related to Profitability? *Farm Economics Facts and Opinions, Issue 93-5*, April 1993. Department of Agricultural Economics, University of Illinois at Urbana Champaign.

Murdoch, J., Marsden, T. and Banks, J. (2000). Quality, Nature and Embeddedness: Some Theoretical Considerations in the Context of the Food Sector. *Economic Geography* 76 (2) 107-125.

Niman Ranch. <http://www.nimanranch.com> (accessed August 2004).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

North Central Region SARE Field Notes (1999). Number 4: Pastured Poultry, Co-op Style. May, 1999.

Organic Trade Association. (2004). The OTA 2004 Manufacturer Survey Overview. <http://www.ota.com/pics/documents/2004SurveyOverview.pdf> (accessed August 2004).

Osborne, C. and Bingen, J. (2003). *Michigan Organic and Community Farmer Roudtables. Summary Report and Recommendations*. Michigan Organic Food and Farm Alliance.

Ostrom, M. and Jackson-Smith, D. (2000). The Use and Performance of Management Intensive Rotational Grazing Among Wisconsin Dairy farms in the 1990s. Program on Agricultural Technology Studies, University of Wisconsin, Madison, WI. PATS Research Report No. 8. <http://www.pats.wisc.edu/pdf%20documents/rr8.pdf>

Patton, M. (2002). *Qualitative Research and Evaluation Methods, 3rd Edition*. Sage Publication, Thousand Oaks, CA.

Paul, C. (2001). Cost Economies and Market Power: The Case of the U.S. Meat Packing Industry. *Review of Economics and Statistics* 83, (3) 531-540.

Pirog, R. (2004). *Consumer Perceptions of Pasture-Raised Beef and Dairy Products: An Internet Study*. Leopold Center for Sustainable Agriculture and the Iowa State University Business Analysis Laboratory.

Ploeg, J. and Renting, H. (2004). Behind the 'Redux': A Rejoinder to David Goodman. *Sociologia Ruralis* 44 (2) 233-242.

Renting, H., Marsden, T. and Banks, J. (2003). Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in Rural Development. *Environment and Planning A* 35 393-411.

Rhodes, V. (1995). The Industrialization of Hog Production. *Review of Agricultural Economics*, 17 (2) (May 1995): 107-118.

Sage, C. (2002). Social Embeddedness and Relations of Regard: Alternative 'Good Food' Networks in South-west Ireland. *Journal of Rural Studies*, 19. 47-60.

Salatin, J. (1998) *You Can Farm*. Polyface, Inc., Swoope, VA.

Schiffman, S. (1998). Livestock odors: Implications for human health and wellbeing. *Journal of Animal Science*, 76, 1343-1355.

The Economics of Pasture Raised Animal Products: Food, Markets and Community

Schiffman, S., Miller, E., Suggs, M., and Graham, B (1995). The Effect Of Environmental Odors Emanating From Commercial Swine Operations On The Mood Of Nearby Residents. *Brain Research Bulletin*, 37, 369-375.

Smith, M., Swalla, M. and Ennis, J. *Literature Review of Research, Publications and Marketing Communications Related to Pasture-Raised Animal Products and Production Systems*. Agricultural Market Research Center, Iowa State University.

Soder, K. and Rotz, C. (2001). Economic and Environmental Impact of Four Levels of Concentrate Supplementation in Grazing Dairy Herds. *Journal of Dairy Science* 84: 2560-2572.

Solomon, L. (2002). Direct Meat Marketing: An Alternative for Farmers. *Kansas State University Research and Extension News*. December 5, 2002.

Tauer, L. and Mishra, A. (2003). *Can the Small Dairy Farm remain Competitive in U.S. Agriculture?* Working Paper, Department of Applied Economics and Management, Cornell University. WP2003-28.

Thu, K. and Durrenberger, E. (1998). Introduction. In Thu, K. and Durrenberger, E., Editors, *Pigs Profits and Rural Communities*. State University of New York Press, Albany.

Time Magazine. (2003). A New Cash Cow. By Maryanne Murray Buechner and North Troy. July 8, 2003.

<http://www.time.com/time/insidebiz/article/0,9171,1101030714-%20463083,00.html> (accessed August 2004).

Tropp, D., Siebert, J., Nayga, R., Thelen, G. and Kim, S. (2004). *Enhancing Commercial Food Service Sales by Small Meat Processing Firms*. USDA Agricultural Marketing Service, Washington, DC

USDA FSIS (a) (United States Dept. of Agriculture Food Safety and Inspection Service) <http://www.fsis.usda.gov/oa/pubs/lablterm.htm> (accessed August 2004).

USDA FSIS (b) (United States Dept. of Agriculture Food Safety and Inspection Service) http://www.fsis.usda.gov/Frame/FrameRedirect.asp?main=/oppde/larc/claims/appvd_claims.htm (accessed August 2004).

USDA FSIS (c) (United States Dept. of Agriculture Food Safety and Inspection Service) http://www.fsis.usda.gov/regulations_&_policies/Listing_of_States_without_Inspection_Programs/index.asp (accessed August 2004).

The Economics of Pasture Raised Animal Products: Food, Markets and Community

USDA FSIS (d) (United States Dept. of Agriculture Food Safety and Inspection Service)
<http://www.fsis.usda.gov/oa/news/2004/bseregs.htm> (accessed August 2004).

Van Der Pol, J. (1999). *Hoop Houses and Pastures for Mainstream Hog Producers*. Greenbook 99, Energy and Sustainable Agriculture Program, Minnesota Department of Agriculture. <http://www.mda.state.mn.us/ESAP/Greenbook1999/gb99vanderpol.pdf>

Van Doonkersgoed, E. (2003). Letter from Ontario: Value Chains versus Supply Chains. *The New Farm* July 2003.
<http://www.newfarm.org/columns/elbert/2003/July/070703.shtml> (accessed August 2004).

Verhaegen, I. and Van Huylenbroeck, G. (2001). Costs and Benefits for Farmers Participating in Innovative Marketing Channels for Quality Food Products. *Journal of Rural Studies* 17 (2001) 443-456

Weil, R. and Gilker, R. (2003). Fact Sheet. Management Intensive Grazing: Environmental Impacts and Economic Benefits. Department of Natural Resource Science and Landscape Architecture, University of Maryland.
http://www.nrsl.umd.edu/faculty/weil/Grazing_factsheet_weil_gilker.pdf (accessed August 2004).

Welsh, R. (1996). *The Industrial Reorganization of U.S. Agriculture*. Henry A. Wallace Institute for Alternative Agriculture.

Welsh, R. and Lyson, T. (2001). Anti-Corporate Farming Laws, the "Goldschmidt Hypothesis" and Rural Community Welfare. Presented to the annual meeting of the Rural Sociological Society, Albuquerque, NM, August 2001. <http://www.i300.org/I-300%20report.PDF>

Westgren, R. (1999). "Delivering Food Safety, Food Quality, and Sustainable Production Practices: The Label Rouge Poultry System in France," *American Journal of Agricultural Economics*, Vol. 81, No. 5, 1999, 1107-11

Whatmore, S., Stassart, P. and Renting, H. (2003). Guest Editorial. *Environment and Planning A* 35 (2) 389-391.

Wheatley, W. (2001). Consumer Preferences, Premiums, and the Market for Natural and Organic Pork: Locating a Niche for Small-scale Producers. University of Minnesota The Swine Center Alternative Swine Production Systems Program February 2001.
<http://www.misa.umn.edu/programs/altswine/litreview.html> (accessed August 2004).

Wright, D. (2004). The Irrationality of Rational Hogs. *The Great Plains Sociologist* 16 (1) Summer 2004. <http://www.misu.nodak.edu/research/Irrationality1.htm> (accessed August 2004).