Small Meat Processors Working Group: Managing knowledge in a new era of agriculture

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Small Meat Processors Working Group:
Managing knowledge in a new era of agriculture

by

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To Thomas F. De Voe, and other butchers
Abstract

Interest has grown considerably during recent years around what Lyson’s (2004) calls “civic agriculture,” the localization of food production with the conscious goal of contributing to local sustainable development. A central challenge facing the growth of civic agriculture has been methodological; what techniques can be used to support collective action towards this new era of agriculture? In this dissertation, I examine knowledge management using a “community of practice” as one method that shows particular promise. I detail the operations of the Small Meat Processors Working Group, a community of practice among technical assistance providers, regulators, and meat locker operators which focuses on holistic knowledge management in order to solve real world problems. The community of practices shares knowledge in ways that bureaucratic structures cannot manage, as theorized by Habermas’ (1987) “communicative rationality.” The Small Meat Processors Working Group (SMPWG) is one of five working groups in Value Chain Partnerships, a contemporary, multi-organization, extension/outreach project in Iowa. In detailing the operations of the SMPWG, I analyze the process of creating three extension publications, which are included in the dissertation. The processes through which the publications were created and the materials themselves illustrate how tacit, contextual, and explicit knowledge can be holistically managed and collectively refined to solve concrete challenges, then cooperatively made available and put to practical use by wider audiences.
(1) Introduction

Lyson uses the term “civic agriculture” as an ideal type, in the Weberian sense, to describe the “rebirth of locally based agriculture and food production” (2004: 1). Within the United States, and elsewhere, there is increasing interest among agrifood scholars, practitioners, and the general public in moving away from industrialization and globalization of agriculture towards the localization of food production with the conscious goal of contributing to local sustainable development. This alternative agro-food “movement” has been well documented (e.g. Shuman 1998; Goodman 2003; Pollan 2009) with entire academic journals devoted to it (e.g. Agriculture and Human Values and Journal of Agriculture, Food Systems, and Community Development). However, a central question for scholars of this “movement” remains how methodologically it can advance to a much broader scale.

In his presidential address to the joint meeting of the Agriculture, Food, and Human Values Society and Association for Study of Food and Society, Gil Gillespie, a close colleague of Lyson, said, “I think the biggest challenge that we face in achieving a sustainable food system is neither determining what we want nor developing the knowledge needed to get us there, but rather it is how do we actually get there, that is, ‘the steering question’ of collective action” (2010, original emphasis). Gillespie states that he doesn’t have any definitive answers, but he makes the case that achieving a sustainable food system must rest on building a greater sense of “community,” a non-geographically delimited relational space that promotes mutual dialogue and understanding amongst people across the food system. The notion of creating “community” connects people and helps them understand each other’s needs and desires; Gillespie uses the Weberian concept of Verstehen, an understanding of people’s intentions within their context, which greatly facilitates collective action.

In this dissertation, I seek to build upon the work of Lyson, Gillespie, and others, by bringing scholarship and tools from the area of knowledge management to bear on building a more civic agriculture. As Gillespie describes – consistent with Habermas’ (1987) theory
of “communicative action,” which will be discussed in more detail later – communication is central to building the “community” necessary for sustainable food system development. Central to communication is the management of knowledge in a holistic fashion. That is, we must be very deliberate in how we create the methods and spaces where this “community” communication takes place in order to include all the necessary information needed to solve real-world sustainable food system challenges. I argue that scholarship and tools from knowledge management can go a long way in helping guide us through this challenge. Thus this dissertation builds simultaneously upon theory and the methodological operationalization of such theory. To illustrate the validity of my conceptualization, I describe and analyze a participatory action research project, the Small Meat Processors Working Group (SMPWG), focused on helping revitalize the small-scale slaughterhouse sector in Iowa through greater coordination of technical assistance and knowledge management, using a “community of practice” approach. I am by no means proposing this as the only way toward realizing civic agriculture, but a promising way.

Working with small-scale slaughterhouses provides a good illustrative case for using knowledge management to build a sustainable food system. While acknowledging that local tactics can and should vary considerably according to contextual factors, Lyson specifically posits three things that must be fostered in all community endeavors to create civic agriculture: proper infrastructure, adequate farmland base, and sufficient technical assistance for farmers and processors to compete in the local marketplace against global players (103).

Small-scale slaughterhouses, along with other small-scale food processing infrastructure, are central to Lyson’s conceptualization of civic agriculture, and so is technical assistance to support them. Without processors meat literally cannot get to market. In order to create local markets and thus civic connections with eaters, medium to small-scale livestock producers and diversified farms that integrate crops and livestock need slaughterhouses capable of turning live animals into steaks, hams, and sausages ready for the home cook, local
restaurants, and local institutions.

This dissertation contains nine chapters. In Chapter 2, I will explore in detail the role that small-scale slaughterhouses, or “meat lockers,” play in fostering civic agriculture, and explore Lyson’s conceptual foundations for civic agriculture. Meat lockers are part and parcel of civic agriculture and the revitalization of this sector must be integral to the fostering of civic agriculture.

In Chapter 3, I introduce a theoretical framework illustrating how organizational structures and associated communications impact knowledge management, drawing on Weber, Blau, and others to examine bureaucratic rationalization, and moving towards Habermas’ civic notion of “communicative rationality.” Then, in Chapter 4, I examine how Habermas’ concept can be operationalized from the perspective of recent scholarship on knowledge management, discussing in more detail how communities of practice manage knowledge holistically. Chapters 5, 6, 7, and 8 focus on the operations of the Small Meat Processors Working Group (SMPWG), one of five working groups in Value Chain Partnerships (VCP), a contemporary, multi-organization, extension/outreach project in Iowa. In Chapters 6, 7, and 8, I focus specifically on the process by which three extension publications were created by this group and include the publications themselves. I use both the creation processes and the materials themselves to illustrate in concrete, proof-of-concept terms how tacit, contextual, and explicit knowledge can be holistically managed and collectively refined to solve concrete challenges, and how such knowledge can then cooperatively be made available and put to practical use by wider audiences.

1 I use the terms “small-scale slaughterhouse,” “meat locker,” and “small meat processor” interchangeably in this dissertation.
In January 2005, at the invitation of Dr. Kamyar Enshayan, I arrived in Cedar Falls, Iowa. Kamyar was running a campaign out of the University of Northern Iowa called “Buy Fresh, Buy Local.” The campaign had been surprisingly successful in weaning hospitals, universities, and restaurants off “imported” food, to the tune of millions of dollars, by helping them find local sources of food, and had done so in a landscape of strip malls and tractor factories, with little agricultural diversity and few specialty restaurants or groceries. Kamyar had invited me to visit for a month to write a magazine article about his program.

In my investigations, I wanted to understand how, in such a seemingly unlikely place, this local food system was ticking right along. Unlike my native California, Iowa is neither renowned for the length of its growing season nor its fine dining. Yet, Iowa had one item of superior quality that it produced amply year-round and which was driving the largest share (41.2%) of millions of dollars in local food sales: meat.² Iowa’s decentralized meat-processing infrastructure, something unknown in California, made this possible. While fruits, vegetables, grains, or pulses can be sold directly by a farmer, meat must be processed before it can be sold for consumption. In Iowa, I had the pleasure of visiting my first small meat processor or “locker.”

For this research, I have chosen to define “small meat lockers” as animal slaughtering facilities that work directly with farmers and regularly process volumes as small as one animal to custom specifications. The name “locker” dates from the days when people lacked home freezers. When rural electrification began in the mid 1930s, typically small towns and/or rural electric cooperatives, operating with technical and financial assistance from the New

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² Percentage based on 2005 data obtained directly from Kamyar Enshayan: kamyar.enshayan@uni.edu. Dairy has also been a significant driver (32.4%), but not as much as meat. Other categories of sales are fruits and vegetables (19.1%), and “other” (7.3%), which includes various locally grown food and nonfood products, such as popcorn, honey, eggs, cooking oil, beverages, and cut flowers.
Deal’s Rural Electrification Administration and sometimes the local Farm Bureau (Mogren 2005), worked to build such facilities to hold foods collectively for residents in frozen storage; each family had its own locker box in the large walk-in freezer. Due to their communal origins, most lockers were given and still bear the name of the town in which they were built, such as the Benson Locker in Benson, Iowa, discussed in the next paragraph. Many plants originally processed all kinds of food for freezer storage, yet meat processing was always a mainstay (Guest 1939). Today, many older plants still have rows of locker boxes in their walk-in freezers available for rent.

My initial experience with an Iowa meat locker in 2005 illustrates the critical role such businesses play in fostering sustainable agriculture and rural vitality through the local, small-scale farm-to-fork value chains they enable. I arrived at the Benson Meat Locker, in Benson, Iowa, just west of Cedar Falls, Iowa, seeking to speak with the owner, Joel Steege, and to buy some local meat. But to buy meat from Joel Steege was not that simple: I had to buy the animal from one of the many local farmers that Joel worked with, and Joel would process it. He had a little meat retail case on the side of the main counter, but he didn’t have enough meat in it to stock a convenience store. This was not what I had envisioned for a butcher shop. Joel ran his own “custom meat locker”: his license, from the state of Iowa, allowed him to cut meat and make sausage, but he could not slaughter livestock and sell that meat. He could still slaughter livestock, and did so, but the meat had to have been pre-sold “on the hoof” (while alive), by the farmer that raised the animal, to individuals for home consumption. When the individual buyer paid for her order of meat, she wrote two checks: one to the farmer for the animal, and another to Joel for the processing.

Because Joel processed the meat to the buyer’s specifications, but without the animals being examined by state or federal inspectors, this arrangement is referred to as “custom-exempt” processing. This status additionally provided for exemption from a number of federal requirements for meat processing plants, such as HACCP – Hazard Analysis and Critical
Control Point – a prevention-focused, systematic food safety management system wherein a plant’s food production process is analyzed for hazards reasonably likely to occur and specific measures are put in place prevent or reduce such hazards to acceptable levels. HACCP, and the meat inspections generally, are part of the role of the state in guaranteeing food safety, historically an issue in meat processing (e.g. Sinclair 1981 [1906]). Under custom-exemption, regulatory sanitation standards must still be met, but the owner(s) of the live animal, in conjunction with the butcher, assumes the role of making sure the animal is fit for the owner’s consumption.

Joel Steege was a young entrepreneur, only 25, but a third generation butcher. He’d known meat his whole life. He could tell how meat would taste just by looking at a hanging carcass. Was there too much fat in the meat or not enough? Had the animal been fed silage, corn, or other grains? What kind of pasture had it been on? Was the animal treated with hormones? Joel could answer these and other questions.

Larry Steege, Joel’s father, ran another custom meat locker a half hour’s drive away, which had been started by Joel’s grandfather. The grandfather sold his farm, moved to town, and started the locker in the 1940s “kind of on a whim,” according to Joel, based on his grandfather’s experience butchering livestock on the farm. Joel started working regularly for his dad while in high school; he had been running his own place since October 2004 (only 3 months prior to my visit). The Benson Locker had come up for sale due to the previous owners’ retirement, and Joel’s father helped him make the purchase. Originally the building had been a creamery, which had gone out of business and was converted into a locker in 1970.

“My dad still helps me out,” Joel said. “Running your own business is a lot of work, a lot of paperwork.” Both Joel and his dad had only several years prior moved all records and orders from paper to a computer. Overall, Joel was very pleased to be running his own business, “Everybody has hard days, but I usually look forward to coming to work in the mornings.”

Four full-time employees worked with Joel in 2005; his dad had a similar-sized
workforce. Iowa minimum wage then was $5.15 per hour; the Steeges paid $7–10 per hour and were looking into health insurance for both shops’ employees. Joel’s employees, three men and one woman, were all older then he was. As the boss, he made the decisions, but the atmosphere was light.

The meats in Joel’s small retail display came, by law, from animals that had been slaughtered at a different facility under state or federal inspection. Joel bought inspected meat in primal sections3 from a larger plant in southern Iowa, though he would have preferred to see the live animals first, to select those of high quality. Retail sales accounted for approximately 10% of his business. “The profits are a lot slimmer. I make almost twice as much from the custom work.”

Within the year, Joel hoped to meet the requirements in order to transition his shop to state inspection for slaughter. This would mean that an inspector from Iowa’s Meat and Poultry Inspection Bureau would be at his plant during all slaughter operations, to examine the live animals before slaughter and the carcasses after slaughter. Such inspection would allow him to sell local meat to customers at his shop and also to restaurants. He would thus be able to choose the cattle he slaughtered for retail. “If I could retail local meat, I’d sell a lot more.” Joel estimated that business might increase 25% in the first year after becoming state-inspected for slaughter. “It’d be cheaper for customers too, taking out one more step. I’m out to serve my customers a good fair price.”

Like his father’s locker, Joel’s retail prices were comparable with the Cedar Falls Hy-Vee supermarket (targeting middle-class buyers), a bit more expensive than the Fareway (targeting a more price-minded market segment). Joel was comfortable with this. “If you have good quality and good service, people will pay more,” Joel said. “If people buy a half or quarter custom beef, they actually save a lot.”

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3 These are the initial sections into which a half carcass, or “side,” is broken down. For beef there are eight primal sections, and hogs four (see the Beef and Pork Whole Animal Buying Guide, Chapter 8).
When “Mad Cow” disease, bovine spongiform encephalopathy, was discovered in the U.S. at the end of 2003, Joel and his father were worried. Yet while many large beef processors saw their sales decline, business for the Steeges “didn’t really change a whole lot,” Joel explained. “People just kept coming in, same as ever. They knew me. They knew my dad. They knew where the cattle were coming from and how the cattle were raised.”

**Civic Agriculture**

Joel Steege, the Benson Meat Locker, and the Iowa meat locker sector more generally, concretely illustrate critical elements of Thomas Lyson’s (2004) “civic agriculture”: transparency, accountability, skill, quality, social and financial equity, and civic responsibility. Lyson describes “civic agriculture” as:

…the embedding of local agricultural and food production in the community. Civic Agriculture is not only a source of family income for the farmer and the food processor; civic agricultural enterprises contribute to the health and the vitality of the communities in a variety of social, economic, political, and cultural ways. For example, civic agriculture increases agricultural literacy by directly linking consumers to producers. Likewise, civic agricultural enterprises have a much higher local economic multiplier than farms or processors that are producing for the global mass market. Dollars spent for locally produced food and agricultural products circulate several times more through the local community than the money spent for products manufactured by multinational corporations and sold in national supermarket chains. (62)

Locker plants are an integral part of their communities. As mentioned earlier, local communities, with deliberate public intension, built most meat lockers in Iowa to serve them. Early in their history, lockers were known as “community cold storage locker plants” (Guest 1939:3). Home freezer storage technology did not exist at this time. So a commercial facility was the only way to store frozen foods. Many communities owned locker plants cooperatively. Some communities built plants with public funds and then sought a local person to take over the business under a lease-to-own agreement. If one small meat locker goes out of business, the local community, much more than the state, will be negatively affected.

Lyson’s conceptual foundation for the benefits of “civic agriculture” and its associated socio-agricultural organization was the result of a post-WWII U.S. Congressional inquiry.
During the war, the U.S. had become significantly organized around large-scale manufacturing businesses. Some members of Congress were curious about the social effects of this trend and formed a “Special Committee to Study Problems of American Small Business” which commissioned two empirical studies.

The first, by C. Wright Mills and Melville Ulmer (1970 [1946]), *Small Business and Civic Welfare*, studied matched-pairs of cities in Michigan, New York, and New Hampshire. What they found was, in the words of Senator James E. Murray, chairman of the committee that had commissioned the report, “[F]or the first time objective scientific data show[ing] that communities in which small businesses predominate have a higher level of civic welfare than comparable communities dominated by big business” (quoted in Lyson 2004:65). The means through which this occurred was the *economically independent middle class*. As Mills and Ulmer reported,

> [This group has] traditionally been the chief participant in the management of civic enterprises. For one thing, he [sic] usually has some time and money available with which to interest himself in these matters. He is, on average, fairly well educated. His work in conducting a small business trains him for initiative and responsibility. He is thrown into constant contact with the administrative and political figures of the city…. Furthermore, the small businessman often stands to benefit personally as a result of civic improvement… (141)

While Lyson is principally concerned with consolidation in agriculture, Mills and Ulmer’s study is principally centered on consolidation in manufacturing. Thus, the findings of the study by Mills and Ulmer are even more directly relevant to meat lockers as small manufacturers.

The second congressional study upon which Lyson bases his civic agriculture conceptualization, by Walter Goldschmidt, *Small Business and the Community*, focused specifically on agriculture. Goldschmidt compared two communities in California’s Central Valley, one with larger, corporate farms and one with relatively small, “family farms.” In other aspects

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4 Originally published as a congressional report in 1946, this study was republished in 1978 with two other studies by Goldschmidt in the volume *As You Sow*. 
population, value systems, and social customs – both towns were very similar and “part of the common system of agricultural production, best understood as industrialized” (1978:393). Goldschmidt found,

The scale of operations that developed in [the large farm community] inevitably had one clear and direct effect on the community: It skewed the occupation structure so that the majority of the population could only subsist by working as wage labor for others…. [This structure] had a series of direct effects upon the social conditions of the community…. It means that a large portion of the population has little vested interest - economic or social – in the community itself. (1978: 415-6)

Echoing Mills and Ulmer, Goldschmidt noted that, “The small farm community is a population of middle class persons with a high degree of stability and tenure, and a strong economic and social interest in the community” (1978: 284). He goes on to state that the socioeconomic inequities associated with the community dominated by larger farms caused civic disinterest because the poor workers lacked both economic means and community tenure for engagement, and the comparatively rich farm owners had the means to recreate and/or live outside of the community. The results of these two studies overwhelmingly indicated that, as might be suspected, diffusion of economic power – in many small businesses, such as meat lockers – resulted in broad civic engagement, while where wealth was concentrated and the social structure hierarchal, community well-being suffered. On the one hand we find democracy, on the other oligopoly.

Per the findings of these two congressional studies and more contemporary research (Shuman 1998; Lyson, Torres and Welsh 2001), Iowa’s meat lockers, as small businesses, not only contribute to the diffusion of economic power, but also they help empower small and diversified farmers by providing market access for livestock and meat sales. A farmer simply cannot take two head of cattle to a large processor to have them processed to custom specifications and returned as retail cuts; the business model of a large packer does not accommodate such flexibility. Large packers buy and process thousands of animals a day. A very small meat locker might only process one animal in a day. The respatialized markets enabled by small meat lockers balance lower volumes with higher margins for producers, giving market
access and economic viability to smaller, diversified and pluriactive farms and firms. Furthermore, the ecological benefits of diversified farming, with crop and livestock integration, are well established (Burkart, James, Liebman, and Herndl 2005). For all these reasons, Kamyar Enshayan (2004), who first invited me to visit Benson Locker, refers to this type of agriculture as, “value-retained agriculture.”

While large packers are very economically efficient, the elimination of middlemen provided by meat lockers can create extraordinary economy for end buyers. For example, a certified organic pig processed at a small locker in 2006 cost only $1.74 a pound, cheaper than conventional ground pork, the cheapest cut, then sold at Wal-Mart for $1.79 a pound. Gomes and Enshayan (2005) similarly have found that local meat purchasing using meat lockers can create real economic and other benefits even for institutional buyers. Whereas a conventional meat supply chain might have as many as six entities – producer, sale barn or other integrator, packer, broker, distributor, and retailer – small meat lockers enable a supply chain with only two entities: the producer and the locker. In addition, the decentralized nature of this type of processing creates another possible food access location for home consumers, particularly if the locker is located in a remote rural area, where grocery store accesses has steadily been declining in Iowa (Morton et al. 2005).
In the introduction, I began to outline a framework to promote civic agriculture, as theorized by Lyson (2004). I argued that techniques to holistically manage knowledge must be central to any civic-agriculture effort. In this chapter, I will outline some key findings from recent scholarship on knowledge management, then theoretically examine the knowledge management through bureaucracy and Habermas’ (1987) “communicative action,” noting specifically how these forms can promote and/or do not promote the principles of civic agriculture. I conclude that the non-hierarchical, communicative form for managing knowledge is better suited to promote civic agriculture, because it better accommodates iterative problem solving and management of tacit and contextual knowledge.

Managing complex, real-world problem – whether in agriculture, meat processing, or another subject area – is a challenging task that requires a large amount of knowledge across a wide array of topics. Recent scholarship in knowledge management (McDermott 2000; Wenger, McDermott, and Snyder 2002; Kikoski and Kikoski 2004) examines the problems of making decisions relying on expert or “explicit” knowledge, characterized by being easily written down or transmitted in some other recorded format from the expert to those seeking the information. These scholars posit the necessity of another kind of knowledge to understand and solve problems: tacit knowledge. Tacit knowledge stands in contrast with explicit knowledge in that it cannot be clearly written down because of intricacy and complexity. Tacit knowledge must be thought and talked about in order to be understood (McDermott 2000). It can only be captured usefully in such dynamic interchange. I also use the term “contextual knowledge” to refer to knowledge of a particular locality or situation that can only really be known by being there, experiencing its environmental and social dynamics. Contextual knowledge is to some degree a tacit knowledge of place.

These three categories of knowledge – explicit, tacit, and contextual – are the only three categories I will use in this dissertation and should be seen as theoretically encompass-
ing the sphere of knowable knowledge, albeit not necessarily to mutual exclusion. Knowledge is inherently dynamic, thus extremely clear definitional boundaries are hard to draw. These classifications, particularly tacit knowledge, will be further examined in chapter 3.

We live in an expert-knowledge-oriented world where tacit knowledge is regularly overlooked by top-down bureaucratic structures. As Peter Blau (1956:20) puts it, drawing on the work of Max Weber, “In contemporary society bureaucracy has become a dominant institution, indeed, the institution that epitomizes the modern era.” Blau praises the efficiency of modern bureaucracy as the source of our “notably higher standard of living” (1956:16), but he warns that bureaucracies “endanger democratic institutions” (1956:25). Blau posits a fundamental contrast between bureaucratic efficiency due to the centralization of power, on the one hand, and the complications of coordinating diverse authority and the free expression of opinion on the other hand. Diverse authority is inherently inefficient due to decentralization of power, voluntary association, and a typical lack of codified rules and regulations (which themselves tend to overlook context).

Efficiency would be associated with bureaucratic operation in situations where only one answer is required for everybody in the state of Iowa and there is need to disseminate it out to as many Iowans as possible. However, in the complexity of the real world, coming up with just one answer is usually the wrong answer. In situations that require many different contextually based answers, decentralized problem-solving authority is in practice more effective than bureaucracy for solving real world problems (Kloppenberg 2004).

Max Weber (1978) first comprehensively studied bureaucracy, the use of meticulous organization and task specialization in order to solve problems. Weber saw bureaucracy as the manifest human organizational structure of a process he dubbed “rationalization,” which he saw as the great driving force of modernity. Weber has often been accused of whole-heartedly em-

5 Other scholars use many other terms to classify knowledge (e.g. local knowledge, embodied knowledge) and it would be beyond the scope of this dissertation to take on a full taxonomy of knowledge.
bracing bureaucracy, without admitting or recognizing its drawbacks. In a chapter called “The Technical Superiority of Bureaucratic Organization over Administration by Notables,” he writes,

The decisive reason for the advance of bureaucratic organization has always been its purely technical superiority over any other form of organization. The fully developed bureaucratic apparatus compares with other organizations exactly as does the machine with the non-mechanical modes of production. Precision, speed, unambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of material and personal costs – these are raised to the optimum point in the strictly bureaucratic administration…, especially in the monocratic form. (original emphasis; 1978:973)

Despite Weber’s laudatory tone, this passage contains hints of his distaste for the practice, for example his emphasis on technical in the first sentence and the mention of bureaucracy’s tendency towards “monocratic form,” the consolidation of power about which Blau (1956) cautioned.

In less formal circumstances, Weber expanded on his own words of caution with biting concreteness strikingly similar to modern-day criticisms of industrialization, as remarks to intellectual colleagues in 1909 reveal:

[T]he forward progress of bureaucratic mechanization is irresistible…. When a purely technical solution of concrete problems is taken as the highest and only goal, then on this basis one can only say: away with everything but an official hierarchy which does these things as objectively, precisely, and “soullessly” as a machine.

…Imagine the consequences of that comprehensive bureaucratization and rationalization which already to-day [sic] we are approaching…. By [rational calculation], the performance of each individual worker is mathematically measured, each man [sic] becomes a little cog in the machine…. The passion for bureaucracy… is enough to drive one to despair. (quoted in Sica 2004:119-20).

The result of this hyper-rationalization is “material irrationality,” where ends are subverted for means, and then, due to the unintended consequences caused by the means, the ends are never produced (Watson 1995:66). As I will discuss in chapter 4, from a knowledge management perspective, the gaps created by bureaucratic task boundaries and the lack of reflective iteration built into bureaucratic structures both create knowledge flows where tacit and contextual knowledge virtually cannot travel (Figure 1, cf. Figure 2). Yet such knowledge is necessary to solve many real-world problems.

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6 As discussed, though not advocated, by Watson 1995; Ritzer 2004; Sica 2004.
For Weber, there was no happy remedy, even if one could stop the rationalization process. For him, the predecessor of bureaucracy, “kadijustice,” which he characterized as an “irrational” justice, such as that based on an individual judge’s sense of equity, (Weber 1978:1395), and its associated administration were not much better. They were “so often venal, precisely because of their irrational character, [which] permitted the development… of the capitalism of traders and government purveyors and of all the pre-rational types known for four thousand years…” (1978:1395). Nepotism and the bribery, certainly not uncommon in the past, were significantly impeded by the “impartiality” and “strict subordination” of bureaucracy, and this left Weber in quite a bind about what to do.

Jürgen Habermas (1987) proposes a third way out: “communicative rationality.” Communicative rationality is social organization based on “communicative action”: people talking with each other, all equally empowered, seeking to accomplish goals through reflexive interaction, social learning, and collective action. This creates a dynamic framework of civic engagement where knowledge of all kinds (explicit, tacit, and contextual) can be shared. As they share ideals of democratic communication and engagement, Habermas’ conception is well suited to civic agriculture.

In contrast Figure 1 on the previous page, communication flows differently through a
communicative rationality (Figure 2). All parties communicate equally with all other parties and incorporate all perspectives into collective decisions for adaptive solutions based on feedback.

Habermas’ proposed social organization is contingent on the exchange of what he calls “pretheoretical knowledge” (1987:153) – tacit and contextual knowledge – and a cautious stance towards efficient “delinguistified media of communication,” for which he uses the examples of money and power to illustrate. Habermas also refers to such media as “steering media” because they “steer social intercourse that has been largely disconnected from norms and values, above all in those subsystems of purposive rational economic and administrative action that… have become independent of their moral-political foundations” (1987:154). This independence allows these constructions to take on a “quasi-natural reality” (1987:154) that displaces tacit and contextual reality. Similarly, civic agriculture seeks to re-embed food production in the civic sphere, and remove agricultural production from the quasi-natural reality of global commodity markets.

Habermas recharacterizes Weber’s “rationalization” as a “reification” (1987:379) of such steering media. The media of money and power are, for Habermas, reified through their real life – or as he puts it, “lifeworld” – institutionalizations as, respectively, the economy.
and bureaucracy. The results are “real abstractions” (1987:378) due to the assimilation of the “vicissitudes of communicatively structured lifeworlds up to the level of media dynamics…[where they are made into] disequilibria in intersystematic exchange relations…it robs them of the significance of identity-threatening deformations, which is how they are experienced from participant perspectives” (1987:377). The whole of the real world, with all of its explicit, tacit and contextual complexity, is abstracted down into the terms of steering media and problems result because steering media cannot faithfully represent the complexity of the lifeworld. Erroneous decisions are made because abstractions are treated as if they are real. The result is a means-ends inversion: everything that slows a certain monetized and power-centric definition of “efficiency,” such as iterative, contextual engagement and communication, is discarded for the sake of efficiency. Herein lies the problem of the bureaucratic form: to create efficiency, inflexible, abstract assumptions must be made, usually based on written rules and regulations (“codifications”). Unlike in a contextualized, civic sphere, characterized by on-going direct communication, reflective interaction very rarely takes place in bureaucracy; tacit and contextual knowledge is never sought.

Bureaucracy works very well when the assumptions and codifications made are right, that is, when there is little difference between their assumed norms and the real world. But without iterative engagement, bureaucracy cannot tell when it is wrong. Thus the efficiency in performing any task is of no significance at all if that task is unhelpful, or worse, counter-productive. The surest means of determining helpfulness is through communicative rationality: asking vested parties about whether the task is helpful. Habermas’ interest is in civic engagement, or, as he titled one of his books, *Structural Transformation of the Public Sphere* (1989). He sees communicative rationality as necessary for the process.

Other theorists have expanded on Habermas’ concept. Röling and Maarleveld (1999:302) see communicative rationality as a “cornerstone for (re)constructing a ‘collective action narrative.’” They do not claim that bureaucratic organization and steering media are
without utility, but they insist that these rational forms must be subjugated; “technology and the market must be conditioned by collective action.”

Mooney (2004) echoes and further details the need for group dynamism or intentional “institutional friction.” Such friction slows things down, in order to reground perspectives in real-world details, and to develop a “multidimensional sociology of cooperation.” Meticulously analyzing the movement to form farmer cooperatives, Mooney charts how, in the drive for systematic efficiency (bureaucracy), debates are silenced, and democracy is destroyed: “Control is usurped by management as members are increasingly defined as incapable of making decisions on ‘technical’ matters that only experts are qualified to make” (84). Communication takes time, time to understand all the relevant factors for all those involved in a process, whether in a cooperative business, the governance of a town, or the interactions of a food system.

Mooney charts this in the larger political sphere as well, recounting an interesting tale of misplaced trust in political (bureaucratic) changes. In the early 20th century, North Dakota farmers gained political control of the state and built state socialist institutions, based on government bureaucracy, rather than cooperative socialist institutions, based on member associations. A decade later they had lost power and their institutions were defunct. Mooney stresses that new social movements require “other logics of action” than bureaucratic management. He suggests “cooperation might be valued for its own sake. No longer seen as merely a means to a given end [e.g. making money], the means and the ends of cooperation are understood as fused” (92). One might call this civic means-ends fusion a convergent functionality, and a noteworthy guard against means-ends inversion. For, if the means and ends are one and the same, they cannot be inverted.

This dissertation seeks to show, in terms consistent with this theoretical discussion, that bureaucratic development programs by themselves, with specific regards promoting civic agriculture and the revitalization of small meat lockers, will produce undesirable results un-
less they are grounded in and guided by communicative rationality towards iteratively and holistically sharing knowledge amongst all relevant groups – in the case of the participatory action research discussed in this dissertation: meat lockers and those who work with meat lockers. Bureaucracy is not inherently flawed, but must be kept in check. The next chapter will discuss how to the theory of communicative rationality can be operationalized.
(4) **Putting Communicative Action into Practice**

In the previous chapter, I discussed Habermas’ (1987) communicative action and how it proposes a theoretical outline for inclusive and non-hierarchical communication as an effective means to solving real-world problems without succumbing to bureaucratic dogmatism. While Habermas’ theoretical work is highly regarded, he has attracted some criticism for not providing much guidance on how to put his theories into practice. As Paul Thompson criticizes, “I break with Habermas in that he and his followers seem content to talk about having a conversation, while I would like to go ahead and have it” (Raffensperger, Campbell, and Thompson 1998: 174). Both Habermas and sustainable food system scholars seem to find themselves in agreement theoretically about the necessary relationship between communication and collective action, but also find themselves in a similar quandary about how to move forward.

Simply put: What exactly does communicative action mean and how do we put it into use? How do we keep ideas grounded in the “lifeworld?” How do we encourage people to talk with each other, all equally empowered, seeking to accomplish goals through reflexive interaction, social learning, and collective action? In this chapter, I draw on current scholarship on knowledge management to illustrate how Habermas’ concept of communicative rationality can be operationalized. I propose what I believe to be a way, certainly not the only one.

Recent knowledge management scholarship (McDermott 2000; Wenger, McDermott, and Snyder 2002; Kikoski and Kikoski 2004) proposes some strategic and tactical solutions to implementing a communicative rationality. These scholars acknowledge the fundamental place that tacit and contextual knowledge need to occupy so that knowledge will be the right knowledge, that is, the knowledge necessary for creating value by enabling people to solve problems and not get caught up in the abstractions of bureaucracy.

As Wenger, McDermott, and Snyder (2002:6) note, “Knowledge has become the key to success. It is simply too valuable a resource to be left to chance.” The performance of every sector of society today – government, companies, civil actor groups – hinges on the
ability of sector actors to find knowledge when they need it and in actionable form so they can make good decisions as new situations arise, to be able to manage adaptively. Because of this need to find knowledge rapidly, we, as a society, have invested heavily in searchable, electronic databases of informational documents (e.g. the internet or proprietary company databases). However, as McDermott points out in another publication,

> Many companies are discovering that the real gold in knowledge management is not in distributing documents or combining databases…. [T]he real value in knowledge management is in sharing ideas and insights that are not documented and hard to articulate. This undocumented, hard-to-articulate knowledge is what has been called tacit knowledge. (2000: 1)

For example, McDermott discusses how a group of computer engineers in a technology company tried to manage their knowledge by documenting client systems in a group database. They found that they did not need each other’s documentation. They needed to understand the logic other computer engineers used – “[W]hy that software, with that hardware and that type of service plan. They needed to understand the thinking of the other system designers” (2000:1).

To understand thinking requires active engagement, both on the part of the person(s) giving the information and the person seeking that information, because, in the “lifeworld,” explaining a non-linear and iterative process requires non-linear and iterative interaction. If I want to know why you’ve done something, I need to ask you about the process in a way that makes sense to me. I must repeatedly ask questions to flesh out the details and logic that I don’t understand; without my questions you won’t know which details I don’t understand.

Tacit knowledge is so complex that direct interaction is the fastest and most realistic way to sort though it all. McDermott illustrates how systematic (bureaucratic) organization of tacit knowledge almost always results in one of two things: information junkyards and empty libraries. Information junkyards result when information databases are created where people are asked to write up all the small details of every project they work on. The resulting database is nothing but clutter. Someone looking for insight needs to sort through countless redundancies and useless information. As one engineering company employee told McDermott,
“My own file cabinet is bad enough, why would I want look through everyone else’s file cabinet?” Often, information databases are created by asking people to distill best practices to follow for a given set of activities. Yet the resulting databases are too general to be useful, and they are seldom used, thus earning them the name “empty libraries.” Lists of abstract concepts emphasize practices like “exercise good leadership” or “use systems thinking” or even “managing tacit knowledge is important.” Yet very little helpful instruction is offered in how such practices might actually be carried out. (McDermott 2000: 1-2)

To provide an informal but concrete example that should be familiar to most readers: following a recipe. My Grandma is a good bread baker. Her bread rises well with a good moist texture and a crisp crust. I ask her to write down a recipe for how she makes her bread. She writes down the appropriate amounts of flour, water, salt, and yeast, when to put them in, and how long to mix them. I follow her directions to the letter, and my bread completely fails: it rises out instead of up and it feels like I’m chewing starched linen when I eat it (no amount of butter will help…). I show my Grandma my failed bread loaf and ask what happened? She asks me how the yeast reacted as it sat in warm water and how the dough felt before I put it in. I can’t even answer this second question; I have no experience feeling dough. She says she’ll come over and make bread with me. I make the bread and ask questions; Grandma watches, provides answers, and points out things I’d never considered before: The yeast is weak, so I need to add some honey and let is sit longer; She shows me how to feel the stickiness of the dough as the gluten extracts during kneading; I am not folding the dough under properly to stretch the surface tightly as I shape the loaf; And because I own a larger oven than my Grandma I need to mist more water into the oven to improve the crust. My kitchen, my ingredients and I provide the contextual knowledge; my Grandma provides the tacit knowledge. And the bread turns out splendidly this time.

Even for something as seemingly simple as baking bread getting the right knowledge is surprisingly complicated; there is a tremendous amount of tacit and contextual knowledge that must be accessed and synthesized in order to have good results. This real knowledge of the
“lifeworld,” as Habermas puts it, involves things difficult to articulate (the feel of the dough), an experienced sense of how things ought to look (the bubbling of the yeast), and the ability to adapt based on contextual factors (misting more water into the oven because it is larger). All of these aspects are things that my Grandma and I had to think about and interact iteratively over in order for me to understand the bread baking process, to have a sense of how to even think about it. We need to operate with a “communicative rationality.” Furthermore, if I were to provide an even more detailed version of this account – measurements, times, temperatures, and all – and a reader tried to bake bread from it with no prior experience, it would be difficult for the reader to succeed because of the many factors that cannot be adequately articulated in writing but require seeing and feeling, and unforeseen contextual differences.

Iowa State University (ISU) Extension has found this to be equally true in its own work. Emeritus ISU Extension Director Ralph K. Bliss, arguably one of the persons most steeped in the workings of Iowa Extension, strongly emphasizes the aspect of working with people on “their own problems.” In the final pages of a retrospective on the first 50 years of extension work in Iowa, he makes the following point three times:

Based on fifty years of experience, mass education of farmers gets best results when there is actual partnership between extension and organized groups [of farmers]. In this partnership plans should be worked out together and built jointly on the basis of joint decision and also on measures which farmers consider important. Programs developed in this way become the people’s programs and as such are much more widely supported. (1960: 227)

Although, here, Bliss explicitly mentions farmers, other sections of his book describe similar best practices when working with farm wives and businesses of various types through the many programs areas of extension. Shared analysis and decision-making are key to public ownership, and thus use, of extension programming.

To put these concepts into practice, Wenger, McDermott, and Snyder suggest using “Communities of Practice,” which they define as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (2002:4). This definition points out three key
aspects: voluntary membership in the community, grounded experience, and iterative interaction. The remainder of this dissertation will explore using communities of practice to manage knowledge and ground bureaucracy in the lifeworld, thus fostering Habermas’s “communicative rationality” to build a civic sustainable food system.
This chapter will examine the community of practice (CoP) method and explain its implementation through the development and operations of the Small Meat Processors Working Group (SMPWG) in Iowa. The chapter unfolds in a linear fashion: formation of the CoP, operation of the CoP and outcomes that grew out of these activities. Information is presented this way for the sake of clarity; real world CoP operations are typically somewhat messy and iterative.

The SMPWG is part of Value Chain Partnerships (VCP), an Iowa-wide meta-CoP made up of the SMPWG and four other focused groups: niche pork, fruit and vegetable production, grass-based livestock, and regional foods (multi-county groups focused on increasing local food production and consumption that are themselves CoPs). Some points will also be examined from the workings of the other groups in VCP.

The three chapters following this chapter (Chapters 6, 7 and 8) will examine the process by which SMPWG created three extension publications by the SMPWG and the publications themselves. Both the processes of producing the documents and the documents themselves will be used to illustrate in concrete proof-of-concept terms how tacit and explicit knowledge can be holistically managed and collectively refined to solve concrete challenges, then cooperatively made available and put to practical use by wider audiences.

Communities of Practice

As mentioned in the previous chapter, Wenger, McDermott, and Snyder (2002:4) describe CoPs as, “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.” This is not a new idea, but what is new is the way these structures are being used to coordinate organizational decision-making – the key challenge to creating a sustainable food system according Gillespie (2010), as discussed in the introduction. As Wenger et al. (6) point out, writing from a business context, new is “the need for organizations to
become more intentional and systematic about ‘managing’ knowledge, and therefore to give these age-old structures a new, central role in the business. Knowledge has become the key to success. It is simply too valuable a resource to left to chance.”

Communities of practice can take on many forms, but Wenger et al. find that they always contain three core elements: “a domain of knowledge, which defines a set of issues [to be addressed]; a community of people who care about this domain; and a shared practice that they are developing to be effective [at communicating and capturing knowledge] in their domain” (27, original emphasis). Respectively, these are the what, who, and how of a CoP.

Although seemingly simple in concept, CoPs can become very complex in implementation. Wenger et al. clearly explain the finer points of using CoPs in a variety of contexts in their practitioner-oriented book Cultivating Communities of Practice (2002). The remainder of this dissertation will only go into detail on CoP functioning within the context of the SMPWG, and occasionally the other VCP groups, to show how these groups use the CoP structure to build knowledge, leverage resources, and coordinate action in regards to rural and agro-food system development.

**CoPs as Outreach Work**

In at least three clear ways CoPs function in a contemporary context to meet outreach goals and manage knowledge more effectively than traditional, bureaucratic outreach programs:

1. CoPs are voluntary in association and operation. They typically are non-hierarchical, with decisions made by consensus. Members do not come to meetings or take actions unless they feel it is worth their time. (This does not mean that members are not asked to make commitments ahead of time, such as committing to attend a certain number of meetings to see things through.)

2. CoPs focus on concrete, real-world problems, in their full complexity, directly and
iteratively with the people who are in fact seeking to solve such problems. There is no abstract assessment process conducted by the group.\footnote{Often the CoP initiator will conduct some sort of background assessment, as I did with the SMPWG. Yet the difference between this and a more common state-wide assessment done by university extension personnel is that my assessment had no bearing unless other people agreed with it enough to join the group.}

3. Perhaps the key point that distinguishes CoPs from other collaborative efforts is the focus on managing knowledge – a distinct focus on the means, not just the ends of a particular collaboration. In particular, they emphasize transferring, developing, and growing knowledge holistically, in order to solve real-world, grounded problems. The actual manifestations of this will vary from CoP to CoP, depending on what Wenger et al. refer to as the CoP’s “practice.”

**Groundwork for the Small Meat Processors Working Group**

*Assessment of the situation and creation of a CoP domain*

As mentioned earlier, Iowa has a relatively high per capita concentration of small meat lockers in comparison with other states in the U.S. However, the number of small lockers in Iowa has been in steady decline for the past four decades, from over 450 in 1965 to less than 150 today.\footnote{These figures are for small meat lockers, defined as facilities that are capable of processing quantities as small as one live animal to custom specifications. There are, and have been, quite a few other small meat processors in Iowa that do not slaughter and rely on other, often large, packers as meat sources. Including these plants, the number would be over 550 in 1965 and less than 200 today.} This decline persists in a climate of strong demand for meat processing services wherein small livestock producers may have to schedule animal processing up to six months in advance, and state and national statistics show increasing demand for niche and local meat products. The persistence of this demand gives strong indication that lockers typically are not closing due to lack of customers seeking their services; larger structural factors
would seem to be chiefly at work. In terms of rural development and connecting local production and consumption, Iowa has enough meat production to be self-sufficient. However, the lack of decentralized processing has become the weak link between farm and fork. (Levy 2001; Peterson 2004; Major 2006; Heller 2007)

My own early investigations showed that small meat lockers were not being adequately served by current systems of structural support. The term ‘structural support’ is meant to include technical support, but also other agency support including, but not limited to, business management counseling, training, grants, and loan guarantees. Lockers go out of business almost exclusively under the following two circumstances: 1) ownership transition and 2) facility upgrades (both due to operational “wear and tear” and regulatory changes). With ownership transition, for example, an older plant owner cannot sell to a younger hopeful because the elder’s accounting system (ball-point pen, legal pad, and shoebox) will not satisfy the younger’s bank loan department’s need for proof of business profitability. New firm entry and existing firm expansion have been stalled by a lack of structural support – agencies not knowing how to connect the dots between each other. As one locker owner-operator involved in the SMPWG said about seeking state agency assistance regarding how to go about building a new poultry processing plant before the SMPWG formed, “Every one of these mucky-mucks I call gives me somebody else to talk to.”

Equally, before the SMWPG, technical assistance and oversight agencies realized that they were not serving small meat lockers well. State agencies regularly working with meat production – Iowa State University (ISU) Meat Science Extension and Iowa Department of Agriculture and Land Stewardship, Bureau of Meat and Poultry Inspection (IDALS) – specialize in processing and handling, but have little experience with available small business development or available resources. As one extension agent said, “I get calls all the time from
someone looking to open or take over a locker. If they have questions about HACCP\textsuperscript{9} plans or processing, I can tell them what they want to know, but if they have questions about securing a loan or getting help with a business plan, I don’t know what to tell them and I don’t know where to send them.”

Iowa had many well-developed agencies with well-trained professionals working to support small businesses, but these agencies were by-and-large poorly inter-coordinated. As is common in bureaucracies, the right hand did not know what the left hand was doing, making it difficult for them to work together. As discussed in Chapter 3, in a bureaucratic structure communication flows along vertical power chains of command, so that those with the potential for a full view to coordinate to resolve problems at the ground level cannot see the ground, while those on the ground lack the power and ability to communicate horizontally. Assistance providers who work in small business planning don’t want to handle meat lockers because of the assistance providers’ knowledge gaps regarding the heavy regulation of meat processors, as assistance providers themselves repeatedly told me. And people familiar with handle meat-processing regulations know little about business planning. Neither set of experts knows the other and meat lockers slip through the crack in between. All of these assistance providers needed to work together and be on the same page about the process to build, upgrade, or expand a small meat plant.

**Community of Practice Formation**

*Bringing together the community of people who care about this domain*

If small meat lockers were not being appropriately served by assistance providers with the current configurations of structural support under hierarchical bureaucratic communication, a way to make communication and knowledge flow across organizations, not just

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\textsuperscript{9} Hazard Analysis and Critical Control Point (HACCP) is food safety process control system discussed in Chapter 2.
within them, would be to bring assistance providers together into a CoP. A space was needed that brought together those who could provide support with those who do provide support and with small meat locker owner-operators. In this space, all would need to be able to communicate on equal ground, learn about the small-scale meat processing sector and other support programs, and determine action steps.

To use the CoP core elements as termed by Wender, McDermott, and Synder, the domain was clear and straight-forward, based on the background assessment: helping small, Iowa meat processors begin, expand, or upgrade facilities. The next steps were to determine who would be in the community and how the group would practice its work.

The answers to both of these questions (the who and the how) were intertwined. To determine them, I interviewed stakeholders – lockers, state agencies, non-profits, producers groups, and the Iowa Food Policy Council – using a “snowball” sampling method about the best way to revitalize the small meat locker sector. I asked them:

1. How would you conduct this project?
2. Who (else) needs to be part of this Working Group?
3. How would you envision coordination of multifaceted support for small meat lockers?

My questions drove at, and I often specifically asked, “How would this be valuable to you?” This line of discussion simultaneously began to establish beyond-perfunctory commitment – “meeting people where they are” – and to set direction, establishing a foundation to identify how these diverse support elements could best be coordinated to complement each other comprehensively. I invited every person and group that I interviewed to participate in the SMPWG. Many of them agreed. Those that were not interested in participation universally stated that they had too many other commitments to participate in the SMPWG. I followed up on every recommendation for another person or organization to interview I received from every interviewee; I interviewed until I could go no further. Upon the completion of this stage, the following organizations had committed to participate in the CoP:
1. Iowa Meat Processors Association (IMPA)
2. Center for Industrial Research and Service (CIRAS) – the Extension arm of the ISU College of Engineering
3. ISU Meat Science Extension
4. ISU Value-Added Extension
5. Iowa Department of Agriculture & Land Stewardship, Bureau of Meat and Poultry Inspection (IDALS)
6. Iowa Department of Economic Development, Business Development Division (IDED)
7. Iowa Small Business Development Centers (SBDC)
8. Practical Farmers of Iowa (PFI)
9. National Center for Appropriate Technology (NCAT)¹⁰

Others groups joined after the working group meetings began: Iowa Farmers Union, Iowa Farm Bureau Federation, Leopold Center for Sustainable Agriculture, and the Drake University Agricultural Law Center. With the exception of the Iowa Farmers Union,¹¹ those groups that joined later joined once they saw the group “had legs.” We were unable to recruit USDA Rural Development, which had been recommended by other members. Both the Iowa Pork Producers’ Association and the Iowa Cattlemen’s Association were encouraging of the project and asked to be kept informed, the former actually providing some initial financial support.

To more deeply and thoroughly evaluate the resources that are available and identify the mechanisms upon which each support element relies, I employed another mode of inquiry, creating what Wenger et al. refer to as “private” CoP spaces, contrasted with the “public” spaces of formal meetings. Not everything can or should happen in public events. One-on-one exchanges are critical. As Wenger et al. elaborate,

> The heart of a community is the web of relationships among community members, and much of the day-to-day occurs in one-on-one exchanges. Thus, a common mistake in community design is to focus too much on public events. A community coordinator needs to “work” the private space between meetings, dropping in on community members to discuss their current technical problems, and linking them with helpful resources, inside or outside of the community. (2004:58)

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¹⁰ NCAT only intermittently participated initially and dropped out when their state office closed in 2007. The state office reopened in 2009 and they are again interested.

¹¹ Based on a suggestion after the first group meeting, I invited Iowa Farmers Union and a representative came. They had not come up in my initial round of interviews.
Taking an orientation towards investigating their strengths more then their problems, I spent time with many of the CoP’s participants outside of the SMPWG meetings examining with them what they felt was important about their work, how they rendered service, the resources they relied on, and how they envisioned being more effective in working with other groups to better serve meat lockers. In the terms of Barrett and Cooperrider (2001) this might be described as a collaborative appreciative approach to ethnography in order to better bring contextual “generative elements” to the discussion. Some of this stage preceded the first working group meetings, as it logically fed into their “meaning creation” (Barrett and Cooperrider 2001). Some occurred between working group meetings. These contextual explorations not only nurtured participation by the organizations, they built trust and increased credibility and “endorsement” of the group’s work and products, and I personally built rapport as the group coordinator. This last point has been particularly important to keeping a group together and focused that has no formal obligation to work together; participation in the SMPWG is completely voluntary. The most important findings of these investigations centered upon understanding the internal organizational languages these groups used – such as the regulatory codes used to by meat inspections – and way organizational performance was evaluated – such as understanding the surveys CIRAS uses to collect impact data for their federal funding stream. Understanding these aspects greatly helped me help organization staff relate the work SMPWG to the goals of their respective organizations. This approach is fundamentally different from any individual organization doing similar work on its own and relying only on its own social capital to market the group’s work and publications.

To conceive of a practice for the SMPWG, how meetings would be organized, I solicited ideas from the working group members and developed some of my own propositions. I discussed these propositions iteratively in one-on-one conversations, beginning in the initial stakeholder interviews. Initially, I proposed writing a report assessing the present situation
and making recommendations to assistance providers. Gary Huber,\textsuperscript{12} with Practical Farmers of Iowa, suggested that the project would be much more effective if it incorporated the groups of assistance providers with meat processors as the practice and had the processors lead the group through their needs, with everybody learning together in the process. Other stakeholders found this idea appealing and after several rounds of thinking and conversation there was consensus for a project orientation for the group with three objectives:

1. Work with three “test cases” – small, Iowa meat processors actively seeking to expand or upgrade – in order to fully explore, in a very grounded way, what support was needed to help these businesses prosper.

2. Produce a guidebook of resources available for small meat processors as an educational resources book for small meat lockers and to serve as a reference for working group member organizations and other organizations with an interest in working with small meat processors.

3. Cultivate inter-organizational trust, familiarity, and social capital among working group members in order to facilitate ongoing partnerships.

The original agreement was to hold four working group meetings over nine months, with meetings about every two months. Many of the CoP members became interested in participating in the group to support the first two objectives, but were less interested in the third. The concreteness of the design and the objective of producing a real, usable product (the guidebook) were much more appealing than nebulous concepts like “familiarity” and “social capital.” The group’s public mission statement, although developed somewhat later, became, “To help small, Iowa meat processors expand, upgrade or build new facilities in order to promote rural development and increase agricultural opportunities.” This was designed to have a positive, inclusive tone.

\textsuperscript{12} Gary has been leading the Pork Niche Market Working Group in the Value Chain Partnerships (VCP) project since 2002. This was an early link between VCP and the SMPWG. While never attending any SMPWG meetings, Gary Huber has been on the groups e-mail list and provided some feedback throughout the process.
CoP Operation or Practice

Our first full CoP meeting occurred in September 2006. The first four meetings lasted two to three hours each and were recorded to assure accuracy of analysis. Nametags were provided to help people become better acquainted. Refreshments were provided to help create a more informal setting. I facilitated the meetings and sought to keep us on task and on time, yet allowed the conversation to wander into areas if they seemed promising and left times of silence to allow those who were not as vocal a chance to speak.

At the first meeting, I provided an overview of the project and our goals and objectives to make sure all agreed and were on the same page. Next, each service-providing member of the group introduced themselves and their organization, the services the organization provided, and what the CoP member specifically did. Following this, the service-providers listened while the three test-case plant owner-operators presented their business visions and hopes. This process led to a discussion of how to develop work plans for each test case. Each plan included how specific CoP member organizations would provide assistance to the “test cases” outside of the full group meetings, as well as suggestions about contacting other service-providing organizations. These plans were iteratively refined, as the project moved forward both inside and outside of group meetings. My role as coordinator varied somewhat with the test cases, depending on the amount of hands-on support each working group member felt able to dedicate, but for the most part my role was pretty extensive. Combined results of these work plans and their iterations were used to structure the *Iowa Meat Processors’ Resource Guidebook* (Chapter 6).

At the end of our first meeting (September 2006), we discussed the first iteration of a support system map, showing what steps a meat plant had to go through in order to build, expand, or upgrade. As discussed by Flora and Grosso (1999), mapping can greatly facilitate the co-creation of meaning. The visual, less-abstract nature of maps helps people see how things fit together into a bigger picture, and how each piece has value (meaning). Mapping in
an appreciative-co-operative framework is an iterative process. For each step in the map, we collectively filled in which organizations were well equipped to provide service in this area. While the map later proved quite useful, the group did not initially seem enthusiastic about it. The final map is included *Iowa Meat Processors’ Resource Guidebook* and can be found on page 54 (Chapter 6).

The second and third working group meetings (December 2006 and February 2007) evaluated the progress of the test cases, refined direction, refined the map, and discussed what additional resources needed to be mobilized and how. At the beginning of each meeting, an overview of the progress and obstacles of each locker test case was provided and questions about the obstacles encountered were addressed to the whole group. Group learning was very central to these two meetings. The second meeting focused on labor in depth and included representatives from a Latino advocacy group. The third focused on financial resources, during part of which I gave an interactive presentation based on resources that had been explored through the test cases.

The fourth CoP meeting (April 2007) focused primarily on evaluating the process and progress of the working group to that point. Arrangements were made for meetings to continue. It was clear that it would take more time to produce the *Resource Guidebook*, and most of the group agreed to continue meeting until it was completed (the Iowa Dept. of Economic Development representative had to drop out at this point due to a promotion, although remained on the e-mail list until the *Resource Guidebook* was completed). During the summer of 2007, an opportunity arose for the CoP to receive some collaborative support and funding to expand its scope of work through the meta-CoP Value Chain Partnerships (VCP). The two working groups in VCP at that time were already using very similar methods to the SMPWG. Their aim was to create multi-organizational outreach programs in areas of niche pork production and regional foods systems. There had already been some cross-pollinations of ideas by Gary Huber of Practical Farmers of Iowa (leading the niche pork group), and Rich Pirog
for the Leopold Center (leading the regional food systems group), as well as the independent working groups’ analyses reaching similar conclusions about collective action. While the financial support was certainly of interest to all the SMPWG members, the opportunity for collaboration with like-minded individuals working on related issues in similar ways was very appealing to me and was explicitly encouraged by several SMPWG members.

Up to this point in time the SMPWG had not been funded, with the exception of less than $10,000 in small donations from various group members and stakeholders to pay my salary as coordinator. All time, space and resources had been donated in-kind. The group enthusiastically agreed to apply for the VCP partnership and funding. We were awarded just over $20,000 in fall 2007. At about the same time, I received funding from USDA-SARE\(^\text{13}\) to cover one-third of my time. Shortly after this we also switched the format of our meetings to conference calls of one to one and half hours every two months, and the group became somewhat more task-oriented, although group learning was still very much at the center of the group’s process. The group was comfortable with the switch in meeting format because of the social capital developed during the in-person meetings. (No new members joined the SMPWG during this conference call period, which would have proven difficult given significance of personal relationships within the group.) We were additionally ready to take on this level of funding because we had developed a clearer sense of purpose through working together. This level of funding earlier on would likely not have been helpful.

With the VCP funding and collaboration the SMPWG has done the following:

1. Published the *Iowa Meat Processors’ Resource Guidebook* an original goal of the SMPWG (Chapter 6 of this dissertation)
2. Held a second year of product pricing workshops designed specifically for small

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\(^{13}\) Sustainable Agriculture Research and Education (SARE) – this particular grant was a North Central Region graduate student grant.
meat processors (Summer 2008). (Generally, small meat processors have tended to make up their pricing based upon the pricing of other small processors, not on actual costs of production.) The first workshops occurred during summer of 2007 led by CIRAS in conjunction with ISU Meat Science Extension, grant funding was provided by the Leopold Center. Although this project initiated outside of the SMPWG, it dovetailed perfectly.

3. Offered two rounds of “mini-grants” of $400-500 each to four small processors to partially support open houses offering free samples of products, and plant tours to promote their businesses and the sector in general.

4. Published *Guide to Designing a Small Red Meat Plant with Two Sizes of Model Designs* to help processors avoid some of the common mistakes associated with new plant construction and additions (Chapter 7 of this dissertation).

5. Published *Beef and Pork Whole Animal Buying Guide* to help processors (as well as producers who direct market) explain with illustrations and text how the primal cuts can be cut into finished cuts, how a carcass cuts out (difference between live, hanging, and finish cut weight), what certain marketing terms mean, and how to store products (Chapter 8 of this dissertation).

With regard to these activities and particularly the publications, I re-emphasize that both their usefulness to and their wide use by meat processors and assistance providers has been due significantly to their collaborative creation. Any single organization doing similar work independently, relying only on their knowledge to produce such work and their own social capital to market it, would have had less useful information and would not have generated the same kind of buy-in for outreach. The SMPWG members emphasized this point during evaluation interviews, as discussed in the next chapter.
Additional Results – Making Ends Meat

By the numbers, the SMPWG has now directly assisted over two-dozen small meat processors directly with product costing and business development. Over 400 copies of the *Iowa Meat Processors’ Resource Guidebook* have been distributed to small Iowa Meat processors, producers, and assistance providers (the CoP members’ organizations, county extension offices, and others). Every meat inspector for the Iowa Department of Agriculture and Land Stewardship has a copy, as does everyone in ISU Meat Science Extension, and every account manager for CIRAS – and, based on informal feedback to me, many of them are reading it and using to help them work with small meat processors. The *Guidebook* was additionally downloaded over 300 times from the internet by groups in Iowa and nationally between its publication in February 2008 and June 2009 (the last date that records were kept). Part of the reason the guidebook has been so widely read is because so many people and organizations were involved with creating it; they had a stake in it from the beginning. It was not simply presented to them as a final product that they might then easily overlook in their busy schedules. Co-learning and co-ownership helps foster co-outreach, which, when dealing with the great complexity knowledge associated with small-scale meat processing, has greater potential for impact.

One of the most important results of this project is that small meat processors are much more visible in Iowa in 2009. Small Iowa meat processors with this project were featured as the cover stories on two of the largest farm publications in Iowa – *Iowa Farmer Today* (March 8, 2008) and *Farm News* (Feb. 8, 2008). News of the CoP was covered by Radio Iowa, and picked up by the *Associated Press* which in turn was run in the *Des Moines Register* and over a dozen other newspapers in Midwestern towns and cities in early 2008. This good press, while perhaps seemingly superficial, helped convey within the group the importance of the work it was doing with small meat processors.

Before the project began, there was little fanfare about small meat processors. (As one
CoP member told me candidly, “We were ignoring them.”) Yet “conventional” groups such as Iowa Farm Bureau Federation, the Iowa Department of Agriculture and Land Stewardship, and three program areas of Iowa State University (ISU) Extension presently actively distribute the *Iowa Meat Processors’ Resource Guidebook* and the other publications, and answer assistance inquiries from small meat processors. The article in *Iowa Farmer Today*, mentioning that three program areas of Extension were working together successfully, prompted the ISU Vice-President for Extension and Outreach to ask for a presentation on the workings of this CoP to his Administrative Team, composed of all the Program Directors of Extension. At the presentation, the Associate Vice-President commented that the project, “…was an excellent model of Extension working holistically.” The CoP member from a Iowa Farm Bureau, learning of this presentation, commented, “I hope the message was heard loud and clear that Extension works best when it works across teams and real resources are put into the hands of people who need them.”

At some points early on in the process of this CoP, I felt like I was forcing things uphill. By mid-2007 momentum had been established. For example, when a question was put to the group about offering more hands-on trainings on “Business Sustainability, Growth, and Succession,” CoP members not only proposed a half dozen excellent suggestions, but those proposing them said that their respective organizations would be willing to take the lead on producing such a training and would donate staff time. Clearly, the membership has taken ownership, and the operations of their organizations (many with considerable resources) are being leveraged to further the goals of fostering healthy and vibrant rural communities and food systems. Organizations that sometime have had competing agenda (“conventional” vs.

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14 In 2009, membership includes the Iowa Meat Processors Association (as represented by 2 small meat processors), Center for Industrial Research and Service (CIRAS), Leopold Center, ISU Meat Science Extension, ISU Value-Added Extension, IDALS Bureau of Meat and Poultry Inspection, Iowa Farm Bureau Federation, and the Drake Agricultural Law Center. Practical Farmers of Iowa and the National Center for Appropriate Technology have been kept in the communication loop.
“alternative” agriculture) are now working together towards the same ends under the banner of “rural development.” This point is discussed in further detail in the next chapter, based on evaluation of the SMPWG. (The complete 3rd-party evaluation of the SMPWG conducted in late 2008 is provided in the Appendix, page 180.)

Some Initial Conclusions

The experiences of the SMPWG CoP are not unique. The other CoPs from the Iowa-based Value Chain Partnership Project (VCP) are achieving similar results. The conclusion from an evaluation of VCP’s Niche Pork and Regional Foods CoPs by Corry Bregendahl states, interviews with participants show the CoPs are building the capacity of ISU, ISU Extension, Iowa farm-serving non-profits, community based organizations, producer associations, government agencies, and other institutions to more effectively and efficiently support diverse farm-based enterprises engaged in activities that contrast in some way from commodity food and agricultural systems. In the process, the CoPs are also influencing commodity partners to change customs and practices. These achievements are made possible by facilitating connections between a vast range of different partners along the value chain, which creates better communication, understanding, coordination, and collaboration. These evaluation results suggest it’s not enough to create support networks for producers. To ensure regional food systems and niche markets survive in Iowa, it is also necessary to create and sustain support networks for support providers themselves.

(It should be noted that the Niche Pork group is coordinated by a non-university-based non-profit producers’ organization, Practical Farmers of Iowa. This fact has not hindered the group in attracting significant Extension and state agency CoP membership and support for the work.)

These evaluation results are consistent with both communicative rationality and the position of Lyson (2004) regarding the need to centrally incorporate technical assistance into any civic agriculture initiative, as discussed in the introduction. CoPs are a new way of forming partnerships to better adaptively handle our inherently dynamic world. These partnerships hold promise for successfully creating a future with increased rural vitality and healthy food production. While other ways may exist to proceed in this direction – and other ways should be explored – CoPs offer a proficient means.
Furthermore, ISU Extension at all levels is interested in this means. VCP will conduct training with Extension in 2010 about how to improve its operations by using adaptive knowledge management as operationalized through the community of practice method. Interestingly, ISU Extension has asked for this training to be a one-day in-service training – like a technology transfer operation. We’ve agreed to this – meeting them where they are – with the agreement that ISU Extension personnel will be encouraged to participate in VCP working groups and participate in or form other CoP-type groups. Consistent with the workings of CoPs, we believe that real knowledge and management skill are much better learned iteratively by doing.

The following three chapters will examine the process by which the SMPWG created three extension publications. Both the process of producing the materials and the materials themselves will be used to illustrate in concrete proof-of-concept terms how tacit and explicit knowledge can be holistically managed and collectively refined to solve concrete challenges, then cooperatively made available and put to practical use by wider audiences without being rendered “substantively irrational” by bureaucratic forces.
(6) Iowa Meat Processors’ Resource Guidebook

A Guide to Building, Upgrading or Expanding a Small Meat Processing Facility in Iowa

Published in Feb. 2008, Iowa Meat Processors’ Resource Guidebook was one of the original goals of the Small Meat Processors Working Group (SMPWG). Value Chain Partnerships (VCP) evaluator, Corry Bregendahl interviewed the 10 most active members of the SMPWG in late 2008 and the number one reported success of the group was the production of the Resource Guidebook. In the evaluation interviews, members of the SMPWG said the guidebook provided a single, comprehensive source of relevant and useful information to small meat processors and service providers: “Everyone I’ve directed to the materials has said it’s exactly what they needed. It’s been used by processors and CIRAS project managers so [they] can tie in product costing and process flow.” Additionally, group members discovered they could achieve new things together, which provided new motivation and opportunities for continuing to work together. As one group member said,

Completion of the [Guidebook] was pivotal for the group in showing that the collaboration would accomplish something visible and usable. [In the start], the goal was the publication and there was no other goal. That publication made it clear to the group that they wanted to go beyond the Guidebook.15

Developing written documents may seem to be in fundamental conflict with the logic of communities of practice (CoPs) with their emphasis on adaptive knowledge management. How can the written word facilitate the tacit and contextual knowledge exchange necessary to solve real-world problems, when the written word is by definition explicit knowledge? Wenger, McDermott, and Snyder (2002: 147-8) discuss how many CoPs use documentation to capture insights ideas, and procedures that have been well worked out by the CoP members. However, these scholars caution that it’s easy to get off-track by focusing on documentation for its own sake (“documentism”) and end up with “information junkyards” (discussed in Chapter 3).

15 Interviews were confidential so it is not possible to provide direct attribution for these quotations.
Documentism is correlated to an exaggerated faith in the value of explicit knowledge that is captured in isolation from the practice environment and the people who use it. Explicit knowledge – reports, manuals, conceptual models, and analytical tools – depends on tacit judgment and skills to be applied effectively. (251, Note 6)

Documents need to remain in touch with the context that created them. And, within context, explicit knowledge can serve as a map of sorts to (re)discover tacit knowledge.

The *Iowa Meat Processors’ Resource Guidebook* does this in several ways. There are a finite and explicit number of things that need to be accomplished in order to build, expand, or upgrade a small-scale meat processing plant in Iowa. There may be an infinite number of tacit and contextual details associated with any individual step, however the steps themselves can be captured in finite and explicit terms. This distinction is key as it makes the undertaking humanly comprehensible.

The tacit and contextual details are brought to interface with the explicit information in the book by the dozens of contacts directly referenced in the book (name, phone number, e-mail, website). With and overview at the beginning, every part of the book provides a general description of the process, what it entails, generally why, and then provides a specific contact person (as often as possible not an organization but a specific person) that any reader can follow up with regarding the specific elements that make the information usable in her or his circumstances. Without these contacts the information would be ungrounded.

As mentioned in the previous chapter, the guidebook was also the result of grounded investigations with real processors, seeking to do real things; it was not the result of an academic exercise. With very few exceptions, no information was published about any technical assistance programs that we could not verify an Iowa meat processor has successfully used – the processor, in his or her own opinion, had benefited from the program. There were many programs that assistance providers claimed meat processors would be eligible for, but this turned out to not be the case when we tried to access the programs with meat processors –
such as the USDA Value-Added Producer Grants Program.\textsuperscript{16}

Logistically, to produce the \textit{Resource Guidebook}, I wrote a first draft based on the knowledge generated during the first year of work by the SMPWG members and sent it to all the members for their review. Members added specific sections based on their expertise; for example, Janis Hochstetler of IDALS Meat and Poultry Inspections wrote the overview on meat inspection and HACCP. The text went through about 4 rounds of revisions, with detailed comments being submitted by all members listed as contributors in the guidebook.

The \textit{Iowa Meat Processors’ Resource Guidebook} is a good example of how a document can be used to facilitate tacit and contextual knowledge management. The guidebook’s multi-organization creation and refinement focused on solving the concrete challenges of real processors produced a document that has been both remarkably useful and remarkably used by all the working group members and small meat processors they interact with.

\textit{Note: The following three appendices were removed from this publication for the sake of space when reprinting in this dissertation:}

A) Outline to writing a business plan by the Iowa Small Business Development Centers

B) General Outline for Project Feasibility Report

C) “Conducting Market Research” By Mary Holz-Clause

\textsuperscript{16} For an Iowa Department of Economic Development program where we specifically asked the program manager if it would work for small meat processors, but did not actually apply, we later found out that it did actually work because of some technical non-program-specific rules about business competition within the state.
Iowa Meat Processors' Resource Guidebook

A Guide to Building, Upgrading or Expanding a Small Meat Processing Facility in Iowa
Purpose of this Guidebook

This guidebook explains the resources available at the local, state and national levels to assist small Iowa meat processors who seek to begin, upgrade or expand their businesses. This book also explains the necessary business and regulatory steps, and where to find guidance for each step.

This guidebook is available free of charge in PDF format at:

www.ncrcrd.iastate.edu/pubs/contents/189.htm

To purchase a printed version, contact:

Kristi Hetland
North Central Regional Center for Rural Development
(515) 294-9768
khetland@iastate.edu
Iowa Meat Processors’ Resource Guidebook: A Guide to Building, Upgrading or Expanding a Small Meat Processing Facility in Iowa is available at http://www.ncrcrd.iastate.edu/pubs/contents/189.htm. For more information contact:

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Iowa Meat Processors Resource Guidebook

A Guide to Building, Upgrading or Expanding a Small Meat Processing Facility in Iowa

Arion Thiboumery, Editor, North Central Regional Center for Rural Development

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Additionally, the following organizations contributed to this project financially or in-kind (alphabetically):

Iowa Farmers Union
Iowa Meat Processors Association
Iowa Pork Producers Association
Iowa Small Business Development Centers
Iowa State University Food Safety Research Laboratories
Iowa State University Meat Science Extension
North Central Regional Center for Rural Development
Practical Farmers of Iowa
USDA Sustainable Agriculture Research and Education
Value Chain Partnership for Sustainable Agriculture
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Index of Acronyms Used in this Guidebook

Organizations

AAMP  American Association of Meat Processors
AgMRC  Agricultural Marketing Resource Center (Web-based resources)
CIRAS  Center for Industrial Research and Service*
FSIS  Food Safety Inspection Service (Part of USDA)
IDALS  Iowa Department of Agriculture & Land Stewardship*
IDED  Iowa Department of Economic Development*
IFU  Iowa Farmers Union*
IMPA  Iowa Meat Processors Association*
IWD  Iowa Workforce Development*
NCRCRD  North Central Regional Center for Rural Development
PDI  Professional Developers of Iowa*
PFI  Practical Farmers of Iowa*
SBDC  Iowa Small Business Development Centers*
SBA  Small Business Administration
SCORE  Service Corps of Retired Executives (Part of SBA)
USDA  United States Department of Agriculture
VAAP  ISU Extension Value Added Agriculture Program*

*These organizations work only within the State of Iowa and may or may not have equivalent counterparts in other states.

Food Safety Programs Used in Meat Plants

HACCP  Hazard Analysis and Critical Control Points
SSOPs  Sanitation Standard Operating Procedures
Introduction

This book is about small meat processing plants, establishments necessary for the vitality of Iowa’s agriculture and rural lifestyle. In 1965, there were over 550 small meat plants in Iowa; today there are less than 200. To address this decline, interested researchers came together to form the Small Meat Processors Working Group. This Resource Guidebook was compiled as a result of our discussions, research and hands-on work with individual meat processors.

The working group found five areas where meat lockers struggle: 1) business planning and feasibility, 2) financing and financial assistance, 3) plant design, 4) plant construction and 5) labor. Additionally, new plant owner-operators often need assistance with the many rules and regulations that govern small meat plants. This guidebook addresses each of these areas.

Comprehensive and systematic resources are laid out in each section of the guidebook. Section 1 focuses on Business Planning and Feasibility, Section 2 on Financing and Financial Assistance, Section 3 on Rules and Regulations, Section 4 on Plant Design and Construction, and Section 5 on Labor. While we have not yet found a straightforward answer to the problem of labor, the group will continue researching this issue, and we do provide some suggestions. In general, each section focuses first on local resources and then moves to state and federal assistance. This was done because we find that the more local the resources are, the easier they are to use and there is a greater likelihood that they will work.

While every effort has been made to provide the most accurate information possible, to err is human. Any mistakes in this guidebook are those of its editor, not of the contributing working group members or organizations. Please be advised that the individual contact information provided throughout this guidebook is subject to change and is beyond our control. Questions, comments, suggestions and corrections should be directed to:

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Aside from the problem areas of business planning and feasibility, financing and financial assistance, plant design, plant construction, labor and, for new plant owner-operators, rules and regulations, many owner-operators and potential owner-operators struggle to figure out what steps are necessary to build, expand or renovate a facility. Figure 1 (page 3) diagrams all of the steps needed to build and operate a meat plant. Whether a meat processor is expanding, upgrading or building a new plant, the steps are similar. Owner-operators need to complete all of the tasks within the large dashed hexagon before they can move to plant construction and operation.

While the steps within the dashed hexagon do not require a fixed order, a logical order might be:

1. **Background Research.** Before going into any business, or expanding an existing one, it is good to ask a lot of questions about the industry. Talk with other meat plant owners, trade groups, regulatory agencies, farmers and customers; many questions and insights will emerge. When you have completed this step, you should have some idea of how you want your business to look. Will it be a small, state-inspected locker selling products only within the state of Iowa or a larger, federally-inspected facility shipping products across the country? Marketing research is discussed briefly in Section 1 (page 5) and is addressed in more detail in Appendix C (page 47).

2. **Business Planning and Feasibility.** The pieces of a business plan are discussed in detail in Appendix A (page 35), but this step involves understanding from where your supplies (animals, non-meat ingredients, packaging, equipment) will be coming, who will be buying your products, and what your competition is like. This step will not happen all at once, but in stages. To complete this step, you will also need to know what your facility will look like and what construction costs will be.

3. **Plant Design.** This is an integral part of both your business plan and your financing. You will need to involve contractors to estimate your construction costs. Information on plant design and contractors begins on page 21 (Section 4).

4. **Financing.** Once your business plan is together, you can start looking for financing. Before you get too excited, we must let you know right now that no one is going to give you a big pot of gold to get your plant going. Your meat business will need to be financed by a local bank. Potential small grant and loan assistance and interest rate reduction programs are explained in Section 2 on page 9.

5. **Permitting and Inspection.** Before you can build anything, you will need permits: business permits, building permits and wastewater permits. Since either the state or the federal government inspects all meat-processing facilities—even custom plants (those that process animals for their owners and do not sell meat to the public) must be inspected periodically—it is generally a good idea to have an inspector look over your plant design before you build. Details are explained in Section 3 (page 15).
6. **SOPs, SSOPs and HACCP**. Before you can begin operation, you will need to have a written plan for each of these. The plans must be examined by your inspection agency and are subject to regular review. This is also discussed in Section 3.

7. **Labor**. You will want to begin thinking about this issue during your business planning. Meat processing is hard work. Finding able and willing employees challenges plants throughout the industry, and finding laborers and the time it takes to train them will be an important part of your business plan. Section 5 (page 25) focuses on this issue.

This outline is very general and simplistic, yet each of these steps is complex and will require much time and energy, as will be detailed in the following sections. We hope this guidebook will make developing or expanding a meat processing business less complex or confusing for you.
Background Research (Prospecting):
IMPA, AAMP, IDALS, VAAP, AgMRC

Business Planning & Feasibility:
CIRAS, SBDC, SCORE
Section 1

Supplies:
IMPA, other plants, Producer Groups & Producers

Plant Design:
IDALS, IMPA, FSIS, Architects & Contractors
Sections 3 & 4

Processing SSOPs & HACCP:
Meat & Food Science Extension, IDALS/FSIS
Section 3

Rules & Regulations:
Waste Water: DNR (IDED will assist with this permitting process)
Business License: IDED
Construction: Local Inspection: IDALS & FSIS
Section 3

Plant Construction:
Contractors
Section 4

Financing:
Local Banks
Financial Assistance:
Local Government, IDED, USDA
Section 2

Labor:
Iowa Community College
Iowa Workforce Development
Latinos in Action
Section 5

Figure 1. Diagram of the steps needed to build, expand or upgrade a meat plant with organizations that can help.

All acronyms are defined at the beginning of this guidebook.
Section 1: Business Planning and Feasibility

Managing and planning a business is more important today than ever before because of the complexities of regulations, the marketplace and slim margins. It is not enough to be able to make the best beef jerky in the entire state. You have to be able to know how much to charge for it, how to market it, how it cash flows through your business and how to manage your employees…or you just might find yourself smoking over hot coals.

Writing a Business Plan

A business plan is the story of your business: how you are going to do it, why it is going to work and how you will handle challenges as they appear. Created by the Iowa Small Business Development Centers, Appendix A (page 35) contains a business plan outline that walks you through all the areas of a plan and asks key questions about each area.

Hands-on Business Help

A number of resources exist to provide hands-on help with business planning and feasibility. Start locally with your town or county’s economic development director. If there isn’t one, move on to one of the regional or state resources detailed in this guidebook. We have listed the specific services that each resource provides, contact information and what we consider to be the advantages or disadvantages of each one.

At the state level, the meat locker owners with whom we have worked find the SBDCs, CIRAS, and SCORE to be best suited to meet their needs based on services provided, fee structure and ease of access. One general caveat for all of these organizations is that the folks working for these counseling agencies often have limited, if any, understanding of the meat processing business. They are very good at crunching numbers and/or reviewing business plans, but they are only as good as the numbers you give them. Only you will be able to determine if the numbers are valid or reasonable. If you have a good handle on the number of animals and pounds of product processed through your plant on a weekly basis, this should not be a problem. If you are starting a business, a critical part of your background research will be to come up with a good estimate for these numbers.

Two noteworthy Iowa locations that have an SBDC, a Pappajohn Entrepreneurial Center and additional service providers, coupled with ongoing classes and resources particularly aimed at serving everyday, mom-and-pop businesses—all at one site—are:

1. Northern Iowa Area Community College (Mason City)
   (641) 422-4111 or
   (888) GO NIACC ext. 4111
   www.niacc.edu/pappajohn

2. University of Northern Iowa
   Regional Business Center (Waterloo)
   (319) 236-8123
   www.uni.edu/rbc
Business Assistance Providers

Organization: Small Business Development Centers (SBDC)
Phone: Central Office—(515) 294-2030
Web site: www.iabusnet.org
Locations: Ames, Burlington, Council Bluffs, Creston, Davenport, Dubuque, Fort Dodge, Iowa City, Marion, Mason City, Ottumwa, Spencer, Urbandale, Waterloo.
Services Provided: Start-up and expansion business plan development, accounting assistance, business succession.
Advantages/Disadvantages: Free services, 14 locations statewide.

Organization: Center for Industrial Research and Service (CIRAS)
Phone: Central Office (515) 294-3420
Web site: www.ciras.iastate.edu
Locations: Call the central office and one of five regional account managers will contact you. All work takes place at your location.
Services Provided: Business plan development, product cost calculating, accounting assistance, feasibility studies, workflow analysis.
Advantages/Disadvantages: They come to you. Many services are free or have a nominal fee. They only work with existing businesses.

Organization: Senior Corps of Retired Executives (SCORE)
Phone: SBA Des Moines Office (515) 284-4422
Web site: www.score.org or www.sba.gov/localresources/district/ia/desmo/counselingt/IA_DESMO_SCORE.html (This second Web site lists Iowa location contact info.)
Locations: Burlington, Cedar Rapids, Clinton, Council Bluffs, Davenport, Decorah, Des Moines, Fort Dodge, Iowa City, Marshalltown, Mason City, Muscatine, Ottumwa, Sioux City, Spencer, Storm Lake, Waterloo.
Services Provided: Business planning and counseling, accounting assistance.
Advantages/Disadvantages: Free services, 17 locations statewide.

Organization: Iowa Farm Bureau Renew Rural Iowa Program
Phone: (800) 254-9670
Web site: www.iowafarmbureau.com/renewruraliowa/
Location: Seminars held at various locations around the state. Mentoring provided by Entrepreneurial Development Center of Cedar Rapids.
Services Provided: Business development and improvement seminars, custom mentoring and connections with various resources.
Advantages/Disadvantages: Registration fee. Ongoing seminar series. Content appropriate for both growing entrepreneurs and existing businesses.
Feasibility Studies

Feasibility studies can either be conducted before or while writing a business plan. A business plan answers the question, “How will we develop the proposed business?” A feasibility study provides an objective third-party analysis of the viability of the business idea and focuses on answering the essential question, “Should we proceed with the proposed project idea?” All activities of the study are directed toward answering this question. Feasibility studies can be useful for many situations, but they are typically conducted for new businesses, major expansions, and entry into new enterprises. If the feasibility consultants are experienced, they will provide all the right questions, a good framework and methodology, and their expert analysis.

Not all feasibility studies are the same; many factors can be examined. Some studies, such as those conducted by CIRAS, examine the financial feasibility of a business expansion—will the business cash flow? Such studies are relatively inexpensive. Cash flow spreadsheets can also be drawn up free of charge by an SBDC. Studies designed to meet the requirements of USDA Rural Development examine at least five areas of feasibility—economic, market, technical, financial and management—and can run from $25,000 to $30,000 each. This type is useful if you are trying to attract investors or trying to get a large loan guarantee from USDA Rural Development. However, they are not useful for the average small-town Iowa meat locker.

The ISU Extension Value Added Agriculture Program is one of the few organizations in the state that regularly conducts USDA Rural Development feasibility studies; they also can conduct specific portions of feasibility, such as market research if you don’t
need a full study. Make sure you know exactly what will be examined by a formal feasibility study and how the results will be useful to you and/or your lender.

While it is always a good idea to get an outside opinion about the feasibility of your business proposition, the size of your business is a good indicator of how comprehensive the study needs to be. Many of the service providers listed above, in addition to your peer meat processors, other small business owners and local bankers, will review and discuss your business plan free of charge.

If you decide to go with a formal study, the Iowa Farm Bureau Federation has grants up to $5,000 available for value added agricultural feasibility studies. A formal, required application form will be given to applicants after an interview conversation assures the project qualifies as value added agriculture. Applications must include written support from the county Farm Bureau board where the business is/will be located. Grant applications will not be considered if written support from the county Farm Bureau is not included.

A general outline for a comprehensive feasibility study is provided in Appendix B, beginning on page 43. Keep in mind that this outline is general and is meant to be for everything from a small mom-and-pop butcher shop to a large ethanol plant. Some of the examination criteria may not need to be as formal for your business, but this outline provides some very good food for thought—most likely there is something here that you have not considered.

### Calculating Product Costs

CIRAS has developed a Microsoft Excel spreadsheet workbook, as well as a paper version, designed specifically to assist small meat processors in calculating their costs of production. Created by working with an actual plant, Food Lockers Service, Inc. in Holstein, Iowa, the spreadsheets are now being used around the state.

### Market Research

While selling products is key to making a business work, understanding your market(s) is fundamental to selling products. Every business plan should have a section examining the market(s) because every lender will want you to clearly, competently and comprehensively explain your market(s) and how you will sell to them. Appendix C (page 47) gives a good overview of what goes into market research.
Section 2: Financing and Financial Assistance

No pot of gold is waiting for you. Unless you are very wealthy, you will probably have to work with a local bank to finance your new plant, upgrade or expansion. Even if you have a good track record with a local banker, you will want to have a business plan, or at least a set of good, accurate financial projections put together before you sit down with a banker.

Many bankers look for what are often called “The Five Cs of Credit”:

1. Cash Flow
2. Character (of the people running the business, evidenced by personal demeanor and past business/occupational history)
3. Collateral—What is the value of the property should you default on the loan?
4. Capital—How much of your own money are you investing?
5. Credit History

Since most meat processors are too small to interest venture capital or take advantage of state tax-exempt bond issues, banks are your best option. That said, the loan terms from one bank to the next can vary widely, even in the same town. Not only are you looking for good terms; you are also looking for a lender with experience in working with small businesses rather than consumer loans. They have a better understanding of risk and other resources that may be available for you. Also, while shopping around, you will receive a free business review from every banker you visit.

Professional Developers of Iowa (PDI)

Many towns, counties, and regions in Iowa have economic development staff, paid to help local businesses. Some organizations have their own revolving loan funds to provide local low-interest small loans. These folks can often be helpful when seeking TIF or tax abatements or for arranging financing, and their services are typically free. TIF and tax abatements are explained in the following pages.

Five Financial Assistance Programs that Work

Many financial assistance programs at the state and federal levels will not work for small meat processors. If we had a dollar for every program out there that we were told could help small meat processors...we could buy a lot of summer sausage! While assistance programs do change from time to time, the five programs listed below are the only ones we found that work reliably for small meat processors.

1. **Tax Increment Financing (TIF)**

   This program allows local area governments to provide loans and grants to, or make accommodating infrastructure improvements for, local businesses up to the amount of increased tax revenue expected over 10 years resulting from commercial/industrial building or expansion. Meat plants receive these funds by requesting them from, and entirely at the discretion of, local city councils and mayors. Some plants have received tens of thousands of dollars through TIF. These funds
have been used both indirectly towards accommodating town infrastructure and directly towards construction costs.

2. Tax Abatement
Separate from TIF, counties and towns can agree to abate taxes for a new or expanding business. This too is entirely at the discretion of the local council members or county supervisors. It generally helps to have good projections about your business’ economic impact and good standing in the community. The bottom line is: if you don’t ask, you won’t get anything.

3. The Rural Economic Development Loan and Grant (“Red Leg”)
This program has considerable history of use by small meat lockers. A significant number of lockers have been built or renovated over the years with these funds. The program is in essence a zero percent interest loan for 10 years, but the loan can only be accessed through a local rural electrical or telephone cooperative. Through a lien on its own assets, the co-op applies to borrow money from the federal government for the sub-applicant business. If successful in its application, the co-op passes the money on to the sub-applicant business. The maximum loan amount is presently $750,000. Successful applicants typically only finance between 5 and 17 percent of a project with this type of loan and never more than 50 percent, according to the Iowa Area Development Group. Applications from businesses in communities of fewer than 2,500 people are more favorably considered. The co-op can charge up to 1 percent per year to finance its own administrative costs. Payment on principal may be deferred for up to a year for an existing business and up to two years for a new business. You must apply for this program through your local Rural Electrical or Telephone Co-op.

4. Farm Bill Energy Efficiency Loan and Grant Program (“Section 9006”)
This program will work only for existing plants. You must have an existing facility or equipment that you are making more energy efficient in order to qualify for a grant, and grants will only cover up to 25 percent of the cost of the eligible portions of renovation. For renovations over $200,000, a feasibility study is required and detailed business financial need must be demonstrated. As explained in the Feasibilities Studies section, the kind of study needed for this grant can cost up to $30,000, and it can be difficult to “prove” financial need when there is someone who will likely loan you the money. Discussions with USDA about this issue revealed it to be a rather “gray” area. It appears that $50,000 is a realistic grant cap for this program.

Here’s a tip on how the Section 9006 program works: Grant monies can only be spent once but loan guarantee funds can be used over and over again. So, Congress encourages the USDA to push the loan guarantee portion of the program. If a company applies for only a grant, the application is held and judged once annually at the national level with all of the other applications. But if a company applies for a grant and a loan guarantee, the decision to allocate funds can be made at the local level, and in a rapid manner to assure that the loan guarantee funds are used.
A company is virtually assured a grant if all of their paperwork is in order and if funds are available when they apply for both a grant and a loan guarantee.

Every application will need a professional energy audit. Contact your local electrical service provider to see if they can either perform such an audit or recommend someone else in your area.

5. The Small Business Administration’s (SBA) Certified Development Corporation ("504") Loan Program

Commonly referred to as “504 Loans,” this program basically provides partially-subsidized and guaranteed loans where your local lender covers up to 50 percent of the project costs, the SBA covers up to 40 percent, and you must put in at least 10 percent. The local bank is put in a senior collateral position, which means that if you default on the loan, they collect on collateral up to the amount you owe them before the SBA. The SBA portion of the loan is usually below market rate, and the local bank is generally happy to be in a senior collateral position with only 50 percent of the investment. The loan can be amortized over 10 or 20 years, but the fees associated with the loan that equal 3 percent of the SBA portion are a drawback. Three percent of $500,000 is $15,000. While this amount is probably not a deal breaker, it is something worth weighing before enrolling in the program. If the offset on SBA interest vs. the market rate is significant, then it works out well. This reiterates the need for plant owner-operators to develop a firm understanding of their financials. To access this loan program, you will need to work with your lender and an SBDC.

Other Loan Guarantee Programs

While a guarantee may be necessary under certain circumstances and can sometimes foster better loan terms (related to repayment period or interest rate) depending on the bank, often they have up front costs of a 1 to 3.5 percent of the portion guaranteed and have annual fees ranging from 1/8th to 1/4th of a percent on the remaining loan balance. The guarantees may also come with high administrative costs due to extensive reporting requirements. In short, these guarantees can have varying cost-to-benefit ratios and should be thoroughly scrutinized based on your particular circumstances. Make sure to ask for a full breakdown of all associated initial and annual fees.
Many loan guarantee programs exist at multiple levels of government, such as:

- **IDED Loan and Credit Guarantee Fund**
  This fund basically provides a loan guarantee up to 50 percent of a bank loan, and there is a micro-enterprise part to the program for businesses located in communities with fewer than 20,000 people.

- **USDA Rural Development Business and Industry Loan Guarantee Program**
  This program can guarantee up to 80 percent of a bank loan, depending on the loan purpose. A USDA Rural Development feasibility study may be required. General guidelines as to whether a feasibility study is needed include:
  - Required for a start-up business.
  - Required for a renewable energy project.
  - Required for an existing business that lacks a profitable history (or when past performance does not support the new debt service).
  - Required for an existing business that will develop an independent operation in a new location.
  USDA will look at each project on a case-by-case basis and make the determination about the feasibility study during the pre-application process.

- **SBA Loan Guarantee program ("7(a) loans")**
  You will have to work through your bank to apply for this type of guarantee. Up to 85 percent of loans of $150,000 and less, and up to 75 percent of loans above $150,000 can be guaranteed for up to 25 years.

### Three Financial Assistance Programs that Might Work for You

Eligibility for most financial assistance programs that the Iowa Department of Economic Development (IDED) offers are tied to the average hourly wage your business pays, or will pay, factoring in the portion your business covers for employee medical, dental and vision benefits. This is referred to as the "wage threshold requirement." The eligibility threshold varies from county to county based on the county’s average wage, and is calculated quarterly. The average hourly wage for the whole state of Iowa in the third quarter of 2007 was $13.53, but some counties, such as Calhoun and Jackson Counties, were in the $10.50 an hour range. The most recent wage threshold requirements by county are available as a Microsoft Excel spreadsheet at:

www.iowalifechanging.com/business/wagerates.html

*(Scroll to the bottom of the page and look for the red link labeled "[year] [number] quarter Wage Thresholds").*
1. Community Economic Betterment Account
2. Economic Development Set-Aside

Two programs that have wage thresholds at 100 percent of the county level (or region, whichever is lower for these programs) are the Community Economic Betterment Account (CEBA) and the Economic Development Set-Aside (EDSA). These programs offer loans and forgivable loans to the tune of hundreds of thousands of dollars, and the funds are fairly unrestricted in what they can be used for, from buildings and equipment to operating expenses and working capital. Being able to meet the wage threshold requirement is the most important issue for these programs, so it is worth a telephone call if you think you are doing this already or can do so for your county.

3. Targeted Small Business Financial Assistance Program

This program might work for you if your business is “at least 51 percent owned, operated and managed by women, minorities or persons with a disability.” This guideline is very strict, so it does not mean that you will be eligible if you are a white male who legally puts 51 percent of your business in your wife’s name. Eligible applicants must be able to fully run the business on their own. Three possible benefits of the program include: 1) loans of up to $50,000 at low interest rates (0% to 5%, repaid over seven years); 2) loan guarantees of up to $50,000 or 80%, whichever is lower; and 3) in limited cases, equity grants of up to $50,000 may be used to leverage other financing.

Contact Information:
(515) 242-4793 or (800) 532-1215,
businessfinance@iowalifechanging.com
www.iowalifechanging.com/business/ceba_edsa.html

Contact Information:
(515) 242-4793 or (800) 532-1215,
businessfinance@iowalifechanging.com
www.iowalifechanging.com/business/tsb_expansion.html
Section 3: Rules and Regulations

This section is divided into two parts. A host of permits that a business may need is listed in the first part; the second part contains information on meat inspection, SSOPs and HACCP. Because obtaining all required permits and a grant of inspection can often be a complex process, we highly recommend that you keep a phone/e-mail/mail log of all the discussions that you have had in the process.

The Iowa Department of Economic Development (IDED) Business License Information Center works to help identify the proper permits needed for a particular business. If you run into problems or have questions, contact them.

Additionally, IDED's Small Business Environmental Assistance Program can offer “free, non-regulatory and confidential advice on environmental issues, serve as your advocate with state regulatory policy makers, and mediate concerns between small businesses and regulatory officials.”

Permitting Checklist

- Business Structure Registration
- Iowa Business Tax Permits
- Iowa Restaurant Sales Permit (only for if your business will contain a restaurant, deli, catering, or similar operation)
- Commercial Scales Permit
- Building and Zoning Permits
- Air Quality Permits
- Waste Water Permit
- Meat and Poultry Inspection License

Business Structure Registration

**Sole proprietorship or simple partnerships:** These types of business will need to fill out a “registration of trade name” certificate at the local County Recorders Office. Contact information is available in the blue “Government” section of your local phonebook, or by going to the county courthouse.

For all other types of business structures (LLC, S corporation, cooperative, etc.), you should contact an accountant and/or an attorney.

The *Guide to Iowa’s Most Commonly Used Business Organizations* can be found at www.sos.state.ia.us/business/handbookintro.html, or it can be obtained from the Iowa Secretary of State’s Office by calling (515) 281-5204.

Contact Information:

**IDED Business License Information Center**
(515) 242-4755 or (800) 532-1216
blic@iowalifechanging.com www.iowalifechanging.com/business/blic.html

**IDED Small Business Environmental Assistance Program**
(515) 242-4896 or (800) 351-4668
regulatoryassistance@iowalifechanging.com,
Iowa Business Tax Permits

Virtually every business will need to fill out a “Business Tax Registration Form” with the Iowa Department of Revenue. This one form can be used to simultaneously file for:

- Retail Sales Tax Permit (not needed if you sell 100 percent nontaxable food items)
- Employee Withholding Tax Registration
- Consumer’s Use Tax
- Corporation/Partnership Income Tax Registration

Iowa Restaurant Sales Permit

Before you begin operating any food service establishment—such as a restaurant, deli or catering business—you will need to obtain a “Food Service Establishment License” from the Iowa Department of Inspections and Appeals, Food and Consumer Safety Bureau.

The application process can take up to 30 days and your license must be renewed annually. Licensing fees range from $50 to $225, based on your annual or projected gross sales.

Commercial Scales Permit

All scales that will be used to determine the sale weight of products, both retail and wholesale, must be certified annually by the Iowa Department of Agriculture and Land Stewardship’s Weights and Measures Bureau.

Building and Zoning Permits

You will need to contact the county and/or city government offices where you live to see if local building or zoning licenses are required. That information is available in the blue “Government” section of your local phonebook.

Air Quality Permits

As a general rule of thumb, if you will be putting any kind of smoke or exhaust stack through your roof, or modifying one in any way, you should contact the Iowa Department of Natural Resources (DNR) Air Quality Bureau. Permits should be obtained prior to building or modifications. Most small meat processors are too small to need a permit, but it’s generally better to ask than to have the DNR shut your plant down for noncompliance.
Waste Water Permits
A processor of almost any size will need to either work with their local town or city to make sure there is adequate waste water infrastructure available or, if located too far out of town, work with the Iowa Department of Natural Resources (DNR) to design an adequate lagoon/leach field system.

For help in working with the DNR, the Iowa Department of Economic Development, Regulatory Assistance Team offers “free, confidential consultation services for any regulatory topic or provides assistance in working with regulatory agencies such as identifying compliance requirements and timing considerations.”

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Help with Infrastructure Construction for Towns and Cities
If your town or city will need to make significant infrastructural improvements to accommodate your new plant or expansion, there are three state programs that can offer financial assistance:

1. Public Facilities Set Aside (IDED): This program provides up to $500,000 to towns and cities for businesses accommodating infrastructural improvements. At least 51 percent of the residents must be low to moderate income, as computed by the most recent census or a town survey. The business must show the creation of one job for every $10,000 granted, and the town or city must pay one-third of the total improvement project costs. Projects are funded on a first-come/first-served basis, so if your timing is right, your town or city will get financial assistance.

2. Community Development Block Grants for Infrastructure (IDED): For “whole systems” upgrades, these grants also require that at least 51 percent of the residents must be low to moderate income. Applications for the program are competitive and awarded every March (applications are due the preceding November). Only one out of every 2 to 3 applications is awarded financial assistance.

3. State Revolving Loan Fund (Iowa Finance Authority): This program provides loans to towns and cities for public waterworks projects. Terms are 3 percent for up to 20 years.

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Meat and Poultry Inspection License
All federal or state-inspected meat/poultry plants, custom or official, must obtain an Iowa Meat and Poultry Inspection License from IDALS. The annual license fee is $25 for less than 20,000 lbs. production and $50 for over 20,000 lbs. production.

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Inspections

To sell meat in interstate commerce, beyond the borders of Iowa, your plant will need to be federally inspected by the USDA’s Food Safety Inspection Service (FSIS). Inspection by the Iowa Department of Agriculture and Land Stewardship (IDALS) will allow you to sell meat within the state of Iowa (intrastate commerce). Plants doing only “custom” work (uninspected livestock/poultry slaughter and/or processing for the animal owner’s personal use) are inspected at least quarterly, based on performance over time, through a “risk-based” review system by IDALS Meat and Poultry Bureau. For a good overview of the different types of meat inspection, go to:

http://www.iowaagriculture.gov/meatandpoultry/slaughter_processing.asp

An overview of Iowa’s state inspection requirements can be found at:

http://www.iowaagriculture.gov/meatandpoultryinspection.asp

Federal Inspections:

According to USDA Officer Rachael Ollinger, “The first step in acquiring a Federal Grant of Inspection is to send a written request to:

Des Moines District Manager
USDA FSIS OFO
Des Moines District Office
210 Walnut Street Suite 985
Des Moines, IA 50309

A packet of information will then be sent to you, including an Application for Grant of Inspection and the requirements the facility must meet. When the Application is filled out and sent back to the District Office, an Establishment number will be reserved; however, the facility will not be able to operate until the Circuit Frontline Supervisor has done a walk through and reviewed the HACCP plan and SSOPs. If the facility meets all requirements, the Frontline Supervisor will recommend that the Grant be approved and a provisional Grant will be issued. After 90 days, the Frontline Supervisor will again visit the facility to perform a “90-day verification” of the food safety program. A permanent Grant of Inspection will then be granted.”

The USDA FSIS has a “Federal Grant of Inspection Guide” that can be downloaded at:

State Inspection:
The state process is similar to the federal process. If you are interested in coming under state inspection contact the Iowa Meat and Poultry Inspection Bureau. Office staff will answer initial questions and provide guidance. Once background information is collected, you will be put in contact with the Area Veterinary Supervisor who will conduct a review of plans and/or facilities, HACCP, SSOPs, labeling, licensing processes and provide guidance for any other regulatory requirement. State guidance material can be found at:

http://www.iowaagriculture.gov/meatandpoultryinspection.asp

Inspection Requirements (SSOPs and HACCP)
The following section discusses two specific inspection requirements, necessary at both the federal and state level. These requirements were chosen as they relate to food safety and are pertinent in starting or expanding operations. There are many other requirements such as labeling, product standards of identity, sanitation performance standards, and microbiological testing, to name a few. Your inspection staff contact will assist you in understanding any additional requirements. Both SSOPs and HACCP plans and logs must be printed and available on-site for inspection at all times.

Hazard Analysis Critical Control Point (HACCP)
HACCP, pronounced “ha-sip,” is a food safety program. This program is based on seven principles that include identifying potential food safety hazards in slaughter and/or processing, monitoring those hazards, and taking corrective actions when hazards are out of control. The HACCP program consists of a written plan that documents the manufacturing processes in a plant and keeping records of the monitoring of critical control points that regulate potential food safety hazards. At least one employee in an establishment must be trained in HACCP and be responsible for the implementation and management of the HACCP program. A written HACCP plan must be completed before an official establishment can be licensed to operate. The establishment must take an active role in HACCP plan development, implementation, and the day-in/day-out HACCP processes. The establishment, or a trained HACCP consultant, can write the HACCP plan, which must be validated—observed in action by an inspection official—within the first 90 days of operation and must be reassessed at least once every 12 months. Inspectors review HACCP records periodically.

Sanitation Standard Operation Procedures (SSOPs)
SSOPs are documented procedures as to how an establishment cleans (sanitizes) the plant. This includes the cleaning of all processing equipment, product contact and non-contact areas/surfaces, and plant facilities on a routine basis, along with records that are kept to document that cleaning has taken place. This cleaning is a prerequisite requirement for HACCP plans. Sanitation is an important part of controlling food safety hazards. A preoperational SSOP, required in the plant on a daily basis, is cleaning that takes place after all processes are completed for the day in order to make the plant clean and ready for the next day—thus the name “preoperational.” An opera-
tional SSOP takes place while the plant is actively processing. These types of sanitation procedures include good sanitary practices by employees, keeping trash picked up and general housekeeping to prevent unsanitary conditions. Both preoperational and operational sanitation procedures are performed and monitored on a daily basis. SSOPs must be written before an official establishment can be licensed to operate.

**HACCP Planning Assistance:** All 50 states have individual HACCP contacts and coordinators who provide technical advice, assistance, resources and support for HACCP implementation in small and very small plants. (FSIS defines small plants as having less than 500 employees, very small plants as having less than 10.)

**Food Safety Inspection Service (FSIS):** FSIS has recently expanded their outreach to small and very small plants.

FSIS has a dynamic “Ask FSIS” Web site where FSIS staff respond directly to posted questions.

http://askfsis.custhelp.com/cgi-bin/askfsis.cfg/php/enduser/std_alp.php

Although it is not geared towards small and very small plants, there is also a FSIS Technical Service Center in Omaha, Nebraska that can answer questions. We recommend that you check with state officials, IDALS or FSIS before pursuing this center for information.

**American Association of Meat Processors (AAMP):** The AAMP is a private, nonprofit trade group whose mission is to help small meat processors. They have full-time staff to answer questions and offer guidance regarding HACCP, SSOPs and product formulation. Most services are free of charge to members; annual membership is $100.
**Section 4: Plant Design and Construction**

No person at Iowa State University, the North Central Regional Center for Rural Development (NCRCRD) or any organization associated with the production of this guidebook can legally recommend a specific contractor, equipment dealer, supplier, service provider or consultant. What we can do is share information about the architects, contractors and equipment dealers used for 10 recently built or renovated meat plants in Iowa, and those with whom plant owners were satisfied. This information does NOT constitute a recommendation, expressed or implied, from Iowa State University, the NCRCRD, other associated groups, or their representatives (the authors of this guidebook). We strongly suggest that you contact locker processors in your area to see who they use for repairs and/or maintenance. We will update this information periodically, so check the following Web site for the most recent version:

www.ncrcrd.iastate.edu/projects/meatprocessors/contractors.html

Below is a map with the location of 10 recently built or renovated meat plants in Iowa to help you find plants and contractors nearest to you.
Table 1. Ten recently built or renovated meat plants in Iowa (listed alphabetically):

<table>
<thead>
<tr>
<th>Plants</th>
<th>Owner-Operator</th>
<th>Phone</th>
<th>Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Atlantic Locker</td>
<td>Dale and Shirley Haupert</td>
<td>(712) 243-1941</td>
<td>J&amp;S Construction (Atlantic, IA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(712) 243-5788</td>
</tr>
<tr>
<td>2. Dayton Meat Products</td>
<td>William and David Dayton, Mark Lang</td>
<td>(641) 528-3420</td>
<td>Pro-Line Building Co. (New Sharon, IA)</td>
</tr>
<tr>
<td>(Malcom)</td>
<td></td>
<td></td>
<td>(641) 637-4035</td>
</tr>
<tr>
<td>3. Edgewood Locker</td>
<td>Terry and Jim Kerns</td>
<td>(563) 928-6814</td>
<td>MEP Construction (Manchester, IA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(563) 927-8487</td>
</tr>
<tr>
<td>4. Elma Locker</td>
<td>Roger, Karen, Joe and Pat Meirick</td>
<td>(641) 364-2402</td>
<td></td>
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<tr>
<td>5. Food Locker Service</td>
<td>John and Shelly Tiefenthaler</td>
<td>(712) 368-4621</td>
<td>Wiese Construction (Cushing, IA)</td>
</tr>
<tr>
<td>(Holstein)</td>
<td></td>
<td></td>
<td>(712) 384-2500</td>
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<tr>
<td></td>
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<td></td>
<td>Used Energy Panel Structures’ (EPS) locking panel material (Graettinger, IA)</td>
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<td></td>
<td></td>
<td></td>
<td>(712) 859-3219</td>
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<tr>
<td>6. Graziano Brothers</td>
<td>Frances Graziano</td>
<td>(515) 244-7103</td>
<td>Bloom Builders (Oskaloosa)</td>
</tr>
<tr>
<td>(Des Moines)</td>
<td></td>
<td></td>
<td>(641) 673-8338</td>
</tr>
<tr>
<td>(La Porte City)</td>
<td></td>
<td></td>
<td>found all sub-contractors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(319) 334-7061</td>
</tr>
<tr>
<td>8. Skoglund Meats &amp; Locker</td>
<td>Mark Skoglund</td>
<td>(515) 887-4531</td>
<td>Zeller Construction (Bode, IA)</td>
</tr>
<tr>
<td>(West Bend)</td>
<td></td>
<td></td>
<td>(515) 379-1102</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Used Energy Panel Structures’ (EPS) locking panel material (Graettinger, IA)</td>
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<td></td>
<td>(712) 859-3219</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(641) 847-3273</td>
</tr>
<tr>
<td>10. West Liberty Locker &amp;</td>
<td>Gail and Suzette Vance</td>
<td>(319) 627-4060</td>
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<td>Processing</td>
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<td></td>
<td>Concrete</td>
<td>Refrigeration</td>
<td>Plumbing &amp; Heating</td>
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</tr>
<tr>
<td>S&amp;M Concrete (Wiota)</td>
<td></td>
<td>Smith Plumbing &amp; Heating (Wiota)</td>
<td></td>
</tr>
<tr>
<td>(712) 783-4270</td>
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<td>(712) 783-4528</td>
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<tr>
<td>Dick Hansen Construction (Victor, IA) (319) 647-3722</td>
<td>Dayton Heating &amp; Cooling (Des Moines, IA) (515) 245-0933</td>
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<td>Ace Refrigeration (Cedar Rapids, IA) (800) 334-7717</td>
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<td></td>
<td>Scheenfeld Refrigeration (Battle Creek, IA) (712) 365-4429</td>
<td>Hargrove's Plumbing (Holstein, IA) (712) 368-2467</td>
<td>Holstein Electric (Holstein, IA) (712) 368-2242</td>
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<td>Lehmans Refrigeration (Des Moines) (515) 243-1974</td>
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<td>Frigitec (Storm Lake, IA) (712) 732-0070</td>
<td>Community Lumber Supply (West Bend, IA) (515) 887-2981</td>
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<td>Arctic Refrigeration (Waterloo, IA) (319) 232-0229</td>
<td>Carsten's Plumbing &amp; Heating (Ackley, IA) (641) 847-2664</td>
<td>Konken Electric (Dike, IA) (319) 989-2155</td>
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<tr>
<td>Harold's Concrete (West Liberty, IA) (319) 627-2606</td>
<td>Blair Refrigeration (Iowa City, IA) (319) 331-5940</td>
<td>Lovell Plumbing (West Liberty, IA) (319) 627-6813</td>
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</tbody>
</table>
**Equipment Dealers**

While there are many companies that sell meat processing equipment, based on discussions with these plant owners and others, we know of five meat processing equipment dealers that frequently service Iowa. Many of the processors listed in Table 1 (pp. 22-24) have purchased used equipment from other lockers and various sources such as the following (listed alphabetically):

1. Dupey, Inc., Des Moines, IA  
   *Carries some used equipment*  
   (800) 798-1857 or (515) 223-0700  
   www.dupeyequipment.com

2. Hobart, five Iowa service locations:  
   Davenport: (563) 326-3557  
   Des Moines: (515) 283-8370  
   Dubuque: (563) 556-8310  
   Sioux City: (712) 944-5285  
   Waterloo: (319) 233-9632  
   www.hobartservice.com

3. Koch Equipment, Kansas City, MO  
   (800) 777-5624 or (816) 753-2150  
   www.kochequipment.com

4. Naughton Equipment Company, Fort Calhoun, NE (Omaha area)  
   (866) 858-4682 or (402) 468-4682  
   sales@naughtonequipment.com  
   www.naughtonequipment.com

5. Pickwick Knase Company, Eden Prairie, MN (Twin Cities area)  
   *Sells poultry equipment only*  
   (800) 808-3335 or (952) 906-3333  
   www.knasecoinc.com

**Architects / Consultants**

Aside from the general contractors listed earlier, we found two meat processing facility architects/consultants that frequently serve small Iowa meat plants (listed alphabetically):

1. Lodge Consulting—Brad Lodge (Clarksville, IA) has overseen many plant renovations and new plant constructions, most recently the Elma Locker.  
   (319) 278-4998

2. Zuber Inc.—Chan Zuber (Eden Prairie, MN) used to own Pickwick Equipment, but now does consulting. He has worked on many plants, including the Edgewood Locker’s construction and design (with his brother Jerry).  
   (952) 906-3333.
Section 5: Labor

Finding capable and willing labor is a serious challenge for all meat processors, regardless of size. Small plants often require a higher average skill level than large plants but cannot afford to pay a high wage through the employee-training period. While we do not know of any great solutions to this issue, we can offer some ideas and programs that have worked reasonably well for other small plants.

Management and Workplace Culture
Retaining employees is just as important, if not more so, than hiring new ones. National studies consistently show that employees quit jobs more often because of workplace culture and relations with other employees, particularly managers or supervisors, than because of the difficulty of the work. What are personal interactions like around your plant? Between employees? Between you or other supervisors and employees? If you are not sure, or think they could be better, you are not alone. This is part of what “management” is all about.

Because this is such an important issue, we highly recommend that you take a class on management at your local community college. These classes can help you understand your management style and how to become a more effective manager, covering specific topics such as time allocation, interviewing, performance reviews, and how to handle workplace conflicts. Iowa has 15 community colleges in the state, each with multiple centers in their areas. Classes are offered as open enrollment throughout the year or can be customized to meet your business and scheduling needs. Check your local phone book to find a community college near you or this Web site:

www.iowalifechanging.com/business/ccmap.html

When considering employee compensation, one should consider more than just hourly wage. Some Iowa plants offer other financial benefits, such as insurance and paid breaks, and one plant lets employees work extra hours if they need the cash, even if business is slow. Many plants around the state offer benefits in addition to salary to show their employees how much they are appreciated. Some examples include free hot lunches a few days a week or every day, free or reduced price meat products, company picnics, and paying for job training.

Labor from “New Iowans”
Big meat packers are increasingly utilizing immigrant labor. Many of these employees are able to learn basic meat skills there, and then they look for better jobs in small plants. If there is an immigrant advocacy organization in your area—and there is likely to be one if you are near a large meat packing plant—you might contact them about posting a job; most will be happy to do so. One Latino advocacy organization that works in the Marshalltown area, home of a large Swift plant, is Latinos in Action, a chapter of Iowa Citizens for Community Improvement.
Iowa Workforce Development has set up a series of “New Iowan” centers to help with employment and training of new Iowans (for example, they offer free English-as-a-second-language “ESL” classes). Contact the regional supervisor for your area if you have questions or would like to post a job opening.

When hiring anyone, you must be careful that all employment paperwork is in proper order. Hiring an undocumented worker can put you in quite a muddle, particularly if you do so knowingly. Iowa Workforce Development staff can provide you with the most current information about required documentation.

**Workforce Investment Act (WIA)**

As many plant owners will tell you and agency representatives will admit, simply posting a small meat plant job through Iowa Workforce Development (IWD) will probably not be as effective as you would like. However, IWD administers a federal program that might be of particular interest to you as a manufacturer/processor. The Workforce Investment Act was passed to “retrain” workers displaced due to international trade. The program subsidizes on-the-job training by paying up to 50 percent of the starting wage for up to six months. (This means that you could start someone at $11+/hr. instead of $7.50/hr while you train them.) To access this program, you will need to contact a “Workforce Investment Act Service Provider” and specifically request to post a job through this program. Iowa is divided into 16 service provider regions, each of which has its own funding from which to run this program, but the funds don’t always make it through the end of the year.

**Vocational Meat-Cutting Schools**

To our knowledge, only three vocational meat-cutting programs exist in the United States: one in Oklahoma and two in Ohio. All three programs focus on high school students; however the Western Technology Center in Oklahoma and the Pioneer Career Training Center accept adult students. The Pioneer Career Training Center teaches slaughter as well as processing skills. All will accept job postings at any time.

**Oklahoma**

Western Technology Center
Meat Processing & Marketing Program
P.O. Box 1469
Burns Flat, OK 73624

Contact: Dennis McRee
(580) 562-3181, ex. 2232
dmcree@wtc.tec.ok.us
www.wtc.tec.ok.us

**Ohio**

Pioneer Career Training Center
Meat Processing Program
27 Ryan Rd.
Shelby, OH 44875

Contact: Bill Kucic
(419) 347-7744 x. 1269
kucic.bill@pctc.k12.oh.us
www.pctc.k12.oh.us/meat.html

Buckeye Career Center
Food Processing/Meat Cutting Program
545 University Dr. NE
New Philadelphia, OH 44663

Contact: Scott Ripley
(800) 227-1665
stripley@bjvs.k12.oh.us
There is another very good program at Olds College in Alberta, Canada which includes training in slaughter. This program lasts five months, is offered twice a year, and costs about $10,000 with room and board.

**Alberta, Canada**  
Meat Processing Program  
Olds College  
4500 – 50th Street.  
Olds, Alberta, Canada T4H 1R6  
Contact: Brad Mcleod  
(403) 556-4972  
bmcleod@oldscollege.ca  
www.oldscollege.ab.ca/programs/MeatProcessing/index.htm

All of these programs are seeking to increase their enrollment numbers. Those in Oklahoma and Canada have 10-15 job opportunities for every student that graduates.

You might consider finding someone young who is interested in learning from one of these programs and send him or her under a written “indentureship agreement.” The agreement would stipulate that she or he would agree to work for you for a minimum number of years after completing training in exchange for your paying for the education. Such an employee would be required to reimburse you for the costs if they dropped out or failed to work for you for the specified minimum amount of time.
Producer Organizations

Producer organizations usually want to know when a new plant is being built or when an existing plant is renovating or expanding. State offices can publish that information in their newsletters if asked to do so. Here are some organizations that have local, county or multi-county offices that can also help you get the word out:

Iowa Cattlemen’s Association
(515) 296-2266
www.iacattlemen.org

Iowa Farm Bureau Federation
(515) 225-5480
sehrig@ifbf.org
www.renewruraliowa.com

Iowa Farmers Union
(800) 775-5227
iafu@isunet.net
www.iafu.org

Iowa Pork Producers Association
(800) 372-7675
info@iowapork.org
www.iowapork.org

Practical Farmers of Iowa
(515) 232-5661
info@practicalfarmers.org
www.practicalfarmers.org
Directory

This directory alphabetically lists all of the organizations mentioned in this guidebook. It notes guidebook contributors and provides full contact information for every SBDC and SCORE office in the state.

AAMP—American Association of Meat Processors
Elizabethtown, PA
(717) 367-1168
www.aamp.com

AgMRC—Agricultural Marketing Resource Center (Web-based resources)
www.agmrc.org/agmrc/business/startingbusiness/

CIRAS—Center for Industrial Research and Service
(515) 294-3420
www.ciras.iastate.edu
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  (515) 570-5282
  martin_b@iowacentral.com

  Derek Thompson
  (515) 419-2163
  thompson@iastate.edu

Drake University Agricultural Law Center
(515) 271-2065
www.law.drake.edu/aglaw
Guidebook contributor:
  Matthew Russell
  (515) 271-4956
  matthew.russell@drake.edu

FSIS—Food Safety and Inspection Service (Part of USDA)
(515) 727-8960 or (800) 990-9834 (main Iowa office)
(202) 690-6520 (National Small Plant Outreach Office)
www.fsis.usda.gov
www.fsis.usda.gov/Small_Very_Small_Plants/index.asp (small plant information)
IDALS—Iowa Department of Agriculture & Land Stewardship, Meat & Poultry Bureau
(515) 281-3338
www.iowaagriculture.gov/meatandpoultryinspection.asp
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  (515) 281-3338
  Gary.Johnson@iowaagriculture.gov
  Janis Hochstetler
  (515) 281-8858
  Janis.Hochstetler@iowaagriculture.gov

IDED—Iowa Department of Economic Development
(515) 242-4700
www.iowalifechanging.com
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  (515) 242-4760
  mark.fischer@iowalifechanging.com

Iowa Farm Bureau Federation
(800) 254-9670
www.renewruraliowa.com
Guidebook contributor:
  Dal Grooms
  (515) 225-5452
  dgrooms@ifbf.org

IFU—Iowa Farmers Union
(800) 775-5227
www.iafu.org

IMPA—Iowa Meat Processors Association
Marsha and Kenneth Richmond, Executive Directors
(563) 452-3329
No Web site
Guidebook contributor:
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  (515) 826-3280
  slocker@netins.net
ISU Meat Science Extension  
(515) 294-5321  
www.ans.iastate.edu/centers/meatlab  
**Guidebook contributor:**  
Dr. Joe Cordray  
(515) 294-4266  
jcordray@iastate.edu

IWD—Iowa Workforce Development  
(515) 281-5387 or (800) JOB-IOWA  
www.iowaworkforce.org

Leopold Center for Sustainable Agriculture  
(515) 294-3711  
www.leopold.iastate.edu  
**Guidebook contributor:**  
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rspirog@iastate.edu

NCRCRD—North Central Regional Center for Rural Development  
(515) 294-8321  
www.ncrcrd.iastate.edu  
**Guidebook contributor & Editor:**  
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(515) 294-2882  
arion@iastate.edu

PDI—Professional Developers of Iowa  
(515) 243-4585  
www.pdiowa.org

PFI—Practical Farmers of Iowa  
(515) 232-5661  
www.practicalfarmers.org

SBDC—Iowa Small Business Development Centers  
(515) 294-2030 (main office; other offices listed on Web site)  
www.iabusnet.org

SBA—Small Business Administration  
(515) 284-4422 (Des Moines Office)  
(800) 827-5722 (National Answer Desk)  
www.sba.gov
SCORE—Service Corps of Retired Executives (Part of SBA, see above)

USDA—United States Department of Agriculture Rural Development Program
(515) 284-4663 (Main State office)
www.rurdev.usda.gov/ia

VAAP—ISU Extension Value Added Agriculture Program
(515) 294-9483
www.extension.iastate.edu/valueaddedag

Guidebook contributor:
Madeline Schultz
(515) 294-0588
schultz@iastate.edu

Value Chain Partnerships for Sustainable Agriculture
(515) 294-8530
www.valuechains.org
valuechains@iastate.edu
(7) Guide to Designing a Small Red Meat Plant
With Two Sizes of Model Designs

The Guide to Designing a Small Red Meat Plant was the second publication that
the Small Meat Processors Working Group (SMPWG) took on, beginning in the summer of
2008. The idea to produce this document originated from the Iowa Department of Economic
Development group member, Mark Fischer, early on in the history of the group. Mark knew
of several trade associations that had developed model facility designs for their membership,
and as the SMPWG discovered that building design specifications was a consistent problem
affection small processors the idea gained traction among the group.

For the production of this guide, we contracted an Iowa-based consultant working
with small meat plants to develop the designs. As with the Iowa Meat Processors’ Resource
Guidebook, I wrote the first outline and draft text, which went through several iterations. As
the reader will see in the publication, there are sections on plant design advice written IDALS
Meat and Poultry Inspections and several locker owner-operators from the Iowa Meat Proces-
sors’ Association (IMPA) Board. As is also noted in the publication, the section on adapting
the model designs to the needs of a particular business is based largely on the work of Mike
Willett with CIRAS and was developed by working closely with him. All SMPWG and IMPA
members who contributed to this guide are listed in the publication.

Surprisingly, development of guide was initially somewhat contentious for reasons
concerning knowledge management. The Iowa Department of Agriculture and Land Stew-
ardship’s Bureau of Meat and Poultry Inspection (IDALS), following the precedent of the
USDA’s Food Safety and Inspection Service (USDA-FSIS), was very cautious about issuing
model designs because they were worried that 1) meat businesses were different and there
was no one-way to do things (impossible to be applicable in all contexts), and 2) they were
worried that model designs published by Iowa State University with contributions from
IDALS staff would be taken as prescriptions from regulators. USDA-FSIS had gotten into
trouble in the past by being overly prescriptive about facility construction (e.g. floors must slope 1/8” per foot towards drains). Industry representatives complained to Congress that there were other ways to achieve good sanitation and that regulation should be based on performance. USDA-FSIS moved to “Sanitation Performance Standards” (e.g. floors must drain and not have standing water) and has been leery of giving construction guidance ever since.

ISU Meat Science Extension was adamant in the other direction: we needed to provide a set of “safe harbor” standards that would work so that people would have a concrete idea from which to start, a good detailed example – in the words of Barrett and Cooperrider (2001) a “generative metaphor.” A compromise was struck by providing two sets of plans that one could realistically build from with ample cautionary statements that the plans should not be directly built from, suggestions about modifications from “veteran” small processors, comments from IDALS, alternative building materials, and a detailed step-by-step process for how the plans could be modified and evaluated based on the specifics of any particular business, with a real step-by-step example of how one processor modified the plans. To relieve IDALS concerns that there was no way to provide model designs for all contexts, the plans are also very specific that they are “ONLY intended for… small-scale plants that intend to slaughter red-meat animals, fully fabricate carcasses, and produce both raw and fully-cooked meat products” (page 91 of this dissertation, original emphasis).

The guide’s systematic and explicit questions for the design modification process ask about tacit and contextual factors such as expected product and personnel flow volumes between work areas and create a format for a weighted ranking of design evaluation criteria generated by the owner-operator. In this way the questions actually are designed to help the owner-operator transform his own internal reasoning into explicit reasoning. And owner-operators are strongly encouraged to consult with their employees to flesh out the employee’s tacit understandings about plant operations with specific questions with the goals of producing as good a design as possible and also encouraging buy-in from employees.
Furthermore, having detailed concrete designs to reflect on – according to the half dozen processors that initially reviewed the publication and the handful of processors I’ve heard from that have used the model designs – has helped processors by giving them explicit reference points and language to help flesh out their understanding of things like equipment positioning with space for operation and maintenance, the ways doors swing, and product flow. Being confronted with detailed concrete plans helps processors to question all the details.

This *Design Guide* was additionally successful because it provided another opportunity for the SMPWG members to collaborate and produced another tool to help service/technical assistance providers in the group facilitate information flow and relationships between meat processors, producers, and the public – and, very importantly, the multi-organization effort developed a strong means to get the tool into people’s hands. Producing the guide was not considered possible without collaboration, as one member commented to Corry Bregendahl during her 2008 evaluation, their organization, on its own, would never have developed the *Guide to Designing a Small Red Meat Plant* or the *Resource Guidebook*.

In a different manner than the *Iowa Meat Processors’ Resource Guidebook*, the *Guide to Designing a Small Red Meat Plant* is a good example of how a document can be used to facilitate knowledge management to solve real problems for real processors. The *Design Guide* has a much more narrowly defined task than the *Resource Guidebook*, and thus its overall impact cannot be as comprehensive and it cannot be expected to foster as many connections as the *Resource Guidebook*. However, because the context of building a small-scale red meat plant is relatively similar across the U.S. this document has been used across the U.S. with good reviews. As one processor in Florida wrote to me,

> I found endless amounts of valuable information in your guide…. This was the most help of anything I have looked at to date…. It has helped me to work out many of the details of my plant in my mind. I think the idea of cutting graph paper of rooms to establish flow is a huge help in the process…. I believe your work has helped me to lay out my plant in a pre-existing building in a manner that will prevent a lot of heartache.
Comments similar to this have come back from around the country. Review of this Design Guide by USDA-FSIS prompted them to develop an agreement with ISU to reprint it and make it available free to the public.

*Note: The appendix “Sanitation Performance Standards of Title 9, Code of Federal Regulations, Section 416.2” was removed from this publication for the sake of space when reprinting in this dissertation.*
Guide to Designing a Small Red Meat Plant with Two Sizes of Model Designs
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Guide to Designing a Small Red Meat Plant with Two Sizes of Model Designs

Arion Thiboumery, Editor, Iowa State University

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- Iowa Meat Processors Association
- North Central Regional Center for Rural Development (www.ncrcrd.iastate.edu)
CAUTION!

These plans are intended for informational purposes only and are not intended for direct construction use. Due to the constantly changing nature of regulations we cannot guarantee that all of the specifications of these plans are up to building code in your specific location. You are strongly encouraged to check with your food safety inspection agency and local building authorities before beginning any construction.

No responsibility is assumed for the accuracy of the information contained herein. The entities, and their agents, involved in the production and distribution of these designs shall have no liability or responsibility for errors or omissions in, or any business decisions made in reliance upon, any information contained herein. The designs are provided as is without any warranty, express or implied, including no warranties for merchantability or fitness for a particular purpose.

Additional professional services will be required to create plan designs tailored to your specific situation, including but not limited to: assurance of compliance with codes and regulations regarding food safety and building construction; review of specifications for materials and equipment; supervision of site selection, bid letting and construction; and provision for utilities, waste management, roads or other access. Furthermore, improper construction may result in structural failure, property damage and personal injury including loss of life.

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About this Guide and Model Designs

Meat plants are not easy to build. Build one like a house, and it will likely fall down in a few years. Put your work areas together in the wrong layout or in the wrong proportions, and things could take twice as long to get done. Put the drains in the wrong spot and you could have to jackhammer out the floors.

Meat plants can vary widely in use and design. How you build a plant depends on the types of processes you intend to have as part of your plant (e.g. slaughter, fabrication, production of ready-to-eat product). These designs are ONLY intended for “locker-type” small-scale meat processing plants. That is to say small-scale plants that intend to slaughter red-meat animals, fully fabricate carcasses, and produce both raw and fully-cooked processed meat products. These designs are NOT intended for plants that seek to slaughter and/or process poultry, solely can meat, solely make prepared entrees which include meat (e.g. pizzas), and process other species not normally processed at a locker-type plant (e.g. fish).

If you intend to construct, expand, or upgrade a locker-type meat plant, these plans were created to help you avoid some headaches, including determining whether or not you should actually expand—sometimes a bottleneck can be corrected by upgrading or moving equipment without adding more space, by changing the way you schedule your product processes, increasing batch size, or changing product flow in other ways. The final design of your plant should be based on the specific needs of your particular business. While these designs are NOT intended to be directly built from, they are intended to give you a good start in the right direction. An experienced meat plant consultant created these designs for the Iowa Meat Processors Association and the Small Meat Processors Working Group, a collaboration of Iowa organizations seeking to support small meat processors. We strongly encourage you to check with your food safety inspection agency and local building authorities before beginning any construction.
How to Use this Book Successfully

As stated on earlier pages, these designs are intended NOT for direct construction use. These designs are ONLY intended to offer information for “locker-type” small-scale meat processing plants—those that slaughter red-meat animals, fully fabricate carcasses, and produce both raw and fully-cooked processed meat products (e.g. sausages, ham, bacon, beef jerky).

In order to successfully use these plans to build, upgrade, or expand a locker-type meat processing plant, we strongly recommend that you go through the following eight steps. Some of these steps need to be taken concurrently, so understand the whole process thoroughly before physically starting any project.

1. **Determine what types of products and/or services you will offer and the production steps needed for each.**

   If you operate an existing business and are considering building a new facility, now is the time to think deeply about what your future products and/or service options might look like as your business grows. Ultimately, you want to design a facility that will help you focus on the products and services that are most profitable. Consider the following two examples:

   a. If you find that hogs are more profitable for you to process than beef, and you plan to process a larger proportion of hogs in your new facility than you currently do, this could reduce the amount of hanging cooler space needed.

   b. If you plan to produce a high-volume sausage product in your new plant, you might consider purchasing a rollstock packaging machine, which is large and might require additional space in your packaging area.

How product flows through your plant will be critical for both plant efficiency and food safety. That flow will be partially dependent on the processes and equipment you will use. Make a list of the equipment you will need by processing area. Understanding all the steps necessary to produce all your products (raw and fully-cooked) will help you modify the designs to efficiently meet your needs. As you consider this, it may help to draw flow charts of how products move through your plant. Flow charts will also help you write your hazard analysis and critical control point (HACCP) plan and sanitation standard operating procedures (SSOPs). It is often easier to build food safety into your design—with proper flow to avoid cross-contamination—than to write operational SSOPs that you must constantly monitor to ensure that employees follow.

---

An **HACCP** plan includes a written document that outlines the manufacturing processes in a plant and the recordkeeping used to monitor critical control points for food safety hazards.

**SSOPs** are documented procedures as to how a plant cleans (sanitizes) all processing areas (equipment, surfaces, etc.).

---

2. Determine which markets you will sell to and what services you will provide so you can identify the types of inspections you will need.

Inspection by the USDA Food Safety and Inspection Service (FSIS)—often referred to as “federal inspection”—will allow you to sell product to anyone throughout the United States and to many overseas markets. State inspection will allow you to sell product to anyone within your state.

A “custom-exempt” plant can only slaughter and process animals for the exclusive use of the animal owner(s). A “retail-exempt” plant can further fabricate or process meat for sale from animals that were slaughtered in a federally- or state-inspected facility (state-inspected only if you operate in the same state). A red meat plant can simultaneously do work that is “custom-exempt,” “retail-exempt,” and state- or federally-inspected; a poultry plant cannot. In Iowa, a plant cannot be both state- and federally-inspected; however, other states vary on this point.

3. Chart the relationships of activities and work areas.

In order to determine an optimal process flow for your plant, many factors must be considered: every process of plant production operations, taking orders, employee break room, utilities, ventilation, and potential cross-contamination. Since it is difficult to take so many different factors into account, a systematic approach is needed to arrive at the best layout for you.

Begin by identifying all the activities and work areas that need to be included in your plant, for example slaughter, fabrication, sausage kitchen, smokehouse, raw packaging and cooked packaging. It may be helpful to use your HACCP flow charts to help you think about all the areas that product moves through in your plant. It is best to keep the number of work areas or workrooms in the range of 10 to 15 with a maximum of 20. If more than 20, the number of possible arrangements becomes overly complicated.

You can create a Relationship Chart using a spreadsheet format or a mileage-type chart. An example of a filled-out Relationship Chart for XYZ Meat Processors (designed for a real business) is shown in Figure 1 on page 4. (Figure 2, a blank chart for your use, is located on page 5.) The Relationship Chart is used to document the desired “closeness” between a work area relative to all the other work areas. Use the letters A, E, I, O, U and X to indicate the relationship between each pair of activities: from A=Absolutely Necessary, to U=Unimportant, and X=Not Desirable (see Table 1 below for all definitions).

You’ll notice that in the sample chart for XYZ Meat Processors on page 4, only the important (A, E, and I) relationships are noted. There is no need to note the unimportant (U) relationships. Depending on your needs you may or may not want to chart the ordinary (O) relationships.

| Table 1. Relationship Values |
|-------------------------------|-------------------|
| VALUE | CLOSENESS             |
| A     | Absolutely necessary  |
| E     | Especially important  |
| I     | Important             |
| O     | Ordinary closeness okay |
| U     | Unimportant           |
| X     | Not desirable         |
Work area relationships can generally be defined as follows:

A relationships = more than 75% of product moves between them
E relationships = 50-75%
I relationships = 25-50%
O relationship = less than 25%

For example, slaughter and holding pens will always have an A relationship because 100% of the animals in the holding pens will go to slaughter (unless an inspector determines an animal is unfit for slaughter). Two cautions about these percentages: 1) they are general, use what makes the most sense to you; 2) they apply to both product flow and people flow. Furthermore, there may be solid reasons why two areas with only a small percentage of product or people flow need to have a much closer relationship—such as supervision, restroom access, or waste removal.

Each relationship can also be documented with a specific reason or reasons for the desired closeness. A small table with number codes is provided on Figure 2 to record each reason. It is important to record your reasons as you work on the layout so you have documentation to rely on—you might not remember what your reason was at a later date. Also, if you are considering multiple plant layouts, each layout will have different reasons for locating certain work areas in certain places. Having these reasons written down will keep things easier to understand.

Some examples of reasons for a specific relationship value are:
- Product flow
- Shared personnel
- Food safety / cross-contamination
- Movement of supplies or waste
- Supervision

This is by no means a complete list, but it should give you an idea of what is meant by the reason for a closeness value or relationship. Do not forget to consider which work areas need to be close to the exterior of the building (this criteria is modeled in Figure 1). If you find that the relationships for a certain work area are similar to that of another work area, think about combining the two into a common area. Two examples to consider are:

a. A sausage kitchen and curing cooler could be located in the same area since they both can lead into a smokehouse.
b. The processing (fabrication) room and the sausage kitchen do not necessarily need a wall between them.

4. Draft plant room layout.

The next step is to combine the relationships charted in the previous step with space requirements for each activity. The first time you try to do this, review the designs in this book and draw the rooms individually from one of these designs onto graph paper. Cut them out and move them around on a table or other flat surface until you find a floor plan layout that best fits your production activity relationships from the previous step. Then tape them in place on a piece of cardboard. Lay out all of the A relationships first, then build in the E and the I (and, if needed, O) relationships next, keeping the X relationships in mind. You can leave spaces where you want hallways and enlarge, shrink, or change the shape of rooms as you see fit by cutting new pieces of graph paper. Make sure to cut all rooms to the same scale (graph paper helps with this). Figure 3 (page 6) is a picture of one plant owner’s result from this process that matches with the Relationship Chart in Figure 1.
Figure 2

RELATIONSHIP CHART

Plant (Company) ___________________________ Project ___________________________
Charted by ___________________________ With ___________________________
Date ___________________________ Sheet _______ of _________
Reference ___________________________

<table>
<thead>
<tr>
<th>Value</th>
<th>CLOSENESS</th>
<th>No. of Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Absolutely Necessary</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Especially Important</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Important</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Ordinary</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>Unimportant</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Not desirable</td>
<td></td>
</tr>
</tbody>
</table>

Total = \( \frac{N \times (N-1)}{2} \)

This block shows relation between "1" and "3"

Importance of relationship (top)

Reasons in code (below)

"Closeness" Rating

Reasons behind the "Closeness" Value

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Once you have a rough floor plan with activity relationships that you like, contact an equipment dealer and get the physical dimension of all the pieces of equipment you plan to buy and make sure each fits in your floor plan with adequate room for operation, cleaning, and maintenance. (It is always easier to give yourself an extra foot or two on paper than to move a wall once your plant is built.) As you position your equipment, think about the placement in similar terms to the way you have just worked out your room positions. Your breaking table and your saw should be next to each other. Your boning table should probably be close by, against a wall. The placement of your grinder, stuffer, and mixer in relation to each other will be entirely up to the needs of your plant.

Adjustments to room sizes should be made in order to create a realistic exterior building shape with straight lines. Make sure to show any dominant physical features such as columns, access doors, walls, etc. If the building or addition already exists, overlay your layouts on the building outline. Depict permanent physical features like load-bearing walls, loading docks, windows, and doors, etc. Once you have arranged things to your liking and everything fits, you might consider going out to a large field (or your building site) and staking out your floor plan on the ground—this might help you get a better feel of how things might look than just reviewing the paper plan.

We strongly recommend trying to make two to three different draft plant layouts. Work with your employees to get their input on the work areas they know best. Perhaps even ask lead employees to come up with their own draft layouts. The more options you consider, the more confidence you will have in the final layout you choose.

5. Evaluating plant layout options.

To decide which layout will best meet your needs, decide on the three to five evaluation factors that are most important to you. Your list might include:

- Ease of expansion
- Cost to build
- Product flow
- Ease of supervision

Next, rate your evaluation factors based on importance to you and assign priority scores for each on a scale of 1 to 10. The most important factor gets a priority score of 10. Less important evaluation factors get proportionally lower scores.

<table>
<thead>
<tr>
<th>Evaluation Factors</th>
<th>Priority Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of expansion</td>
<td>7</td>
</tr>
<tr>
<td>Cost to build</td>
<td>9</td>
</tr>
<tr>
<td>Product flow</td>
<td>10</td>
</tr>
<tr>
<td>Ease of Supervision</td>
<td>5</td>
</tr>
</tbody>
</table>

Next, rank each of your layout options for each of the evaluation factors (tied rankings for multiple layouts are okay). Do not confuse the rank with the priority score from the previous step (see example on page 8).

Now go back to your priority scores and for each evaluation factor for each layout option, divide the rank by the priority score, and then add these to find the new weighted values for each layout (see example on page 8).
Rank (Example):

<table>
<thead>
<tr>
<th>Layout</th>
<th>Ease of expansion</th>
<th>Cost to build</th>
<th>Product flow</th>
<th>Ease of supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Option 2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Option 3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Weighted Evaluation Factors (Example):

<table>
<thead>
<tr>
<th>Layout</th>
<th>Ease of expansion</th>
<th>Cost to build</th>
<th>Product flow</th>
<th>Ease of supervision</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>(7 \div 1 = 7)</td>
<td>(9 \div 1 = 9)</td>
<td>(10 \div 2 = 5)</td>
<td>(5 \div 3 = 1.67)</td>
<td>22.67</td>
</tr>
<tr>
<td>Option 2</td>
<td>(7 \div 2 = 3.5)</td>
<td>(9 \div 3 = 3)</td>
<td>(10 \div 2 = 5)</td>
<td>(5 \div 1 = 5)</td>
<td>16.5</td>
</tr>
<tr>
<td>Option 3</td>
<td>(7 \div 1 = 7)</td>
<td>(9 \div 2 = 4.5)</td>
<td>(10 \div 1 = 10)</td>
<td>(5 \div 2 = 2.5)</td>
<td>24</td>
</tr>
</tbody>
</table>

The layout with the highest total score should be the best alternative. In this example that would be Option 3, but Option 1 would be a close second choice. If the priority scores were to change slightly, the highest layout score could easily change. As you can see, there is a lot of subjectivity in this process, but the point is to try to make the subjectivity visible and well thought-out so that this important decision is not made blindly.

6. **Work with your contractors (and architect, if needed) to detail your plant’s design.**

How will the plumbing, electricity, refrigeration, and ventilation work? What types of interior, exterior, and insulation materials will you use? Up to this point, the layout consists of blocks or various shapes for work areas. Now you can develop the final plan that will be used as a guide to show precisely where everything goes in the plan.

Reproduce the selected layout plan, preferably to a scale of 1/8 or 1/4-inch equals a foot. First, draw in the major equipment and then the smaller equipment and label them. As you begin to do this, you will find yourself re-evaluating the fit of these details and making minor adjustments for such things as door swings, adequate aisle space, and space for maintenance, service, etc. As you position equipment, you should also document other physical features that may be required on separate features "schedules" such as:

- Ceiling heights
- Fire or other hazards
- Door sizes and types
- Finishing materials
- Adequate room for cleaning of areas and equipment
- Minimum support column spacing for carcass rails
- Ventilation
- Hot and cold water lines and drains
- Cooler lines and compressors
- Electrical and natural gas lines and hookups

The above list of features should NOT be considered all-inclusive. Each meat plant will have its own unique considerations, and the plans should be created to include any necessary features. Schedules for many of these features are included with each of the two model designs in this book.

Make sure the arrangement is functionally sound. One of the best ways to accomplish this is to involve employees from the individual work areas in this step. By using teams, not only will you find that you develop a
better layout, but you will have less resistance in installing the plan because employees will take ownership of a plan they helped develop.

7. Review and revise, revise, revise until you are completely happy with all of the details.

You want to build your new plant right the first time. There are suggestions in this book about possible ways to do it, but these may not be right for the specifics of your plant and/or geographic area.

If you are not near a municipal sewer system, you will need to consult with the Iowa Department of Natural Resources about wastewater management. You might also want to consult with a certified civil engineer and/or the Cornell Waste Management Institute in New York State (http://cwmi.css.cornell.edu/), a national leader in this area.

8. If you have not done so already, contact your food safety inspection service and work with them to finalize the details of your plant before you begin construction.

While federal or state food safety inspectors cannot tell you how to build your plant, they may suggest ways your plant can meet the Sanitation Performance Standards of Title 9, Code of Federal Regulations, Section 416.2 (this code, 9 CFR 416.2, is included in the appendix for your reference). These requirements are based on performance, but the code provides no specifics on how you must meet the requirements. The requirements are primarily concerned with:

- Pest management
- Use of tested potable water
- Adequate drainage that prevents backflow and keeps sewage lines distinct from wastewater
- Adequate lighting and ventilation
- Adequate rest rooms, handwashing stations, and garbage cans.
- Walls, floors, and ceilings must be impermeable to moisture and easily sanitized.
- And the catch-all: Building conditions must not result in product adulteration or the creation of insanitary conditions.

There are no regulated metrics for adequacy. You must be able to show that your facilities will be adequate. The idea behind performance standards is similar to HACCP, but the requirements for scientific documentation are not as strict. Usually, the guidance of a professional construction contactor or engineer is sufficient.

Food Safety Inspection Agencies

State Inspection for Iowa
Iowa Department of Agriculture and Land Stewardship
Meat & Poultry Inspection Bureau
(515) 281-3338
www.iowaagriculture.gov/MeatAndPoultry.asp

Federal Inspection
USDA Food Safety and Inspection Service (FSIS)
Des Moines Office of Field Operations
(OFO, covers all of Iowa and Nebraska)
(515) 727-8960 or 1-800-990-9834

Contact information for other FSIS OFO offices can be found online at:
www.fsis.usda.gov/Contact_Us/Office_Locations___Phone_Numbers/index.asp

Note on Improving Plant Productivity

For an existing plant, an expansion or upgrade to the facility may not be necessary. You may be able to increase the volume of product you can process without a bricks and mortar change. Before you jump head-first into a project that could cost hun-
dreds of thousands of dollars or more, consider your plant as a whole system of activities that are linked together in a certain order.

For example, slaughter leads to fabrication leads to grinding and packaging. The activities that make up a meat processing business are really a chain of dependent events, including the movement of product between different processing areas and storage. A plant cannot sell products until they are packaged, cannot package products until they are moved to the packaging area, and cannot move products to the packaging area until the products are cut, smoked, etc.

Each step is dependent upon what happens before it. The amount of product being processed at each step should match up with what is happening in the steps before and afterwards, otherwise bottlenecks occur. For example, if your sausage kitchen was twice as large, but you had the same size smokehouse, would you be able to produce product twice as fast? Probably not. Before you make the decision to physically expand any part of your plant, ask yourself, "If I had the capacity to do twice as much in this area or process, would I make twice as much money overall or would things just start backing up in the areas and processes afterwards?" Perhaps you don't need a new building, but rather a bigger smokehouse and/or faster packaging equipment. *Processors building new plants should also keep this in mind as you select equipment and design your layout.*
Arrangement of the Designs in this Book

This book contains designs for two different sized plants: a *small* plant measuring 2,600 square feet and a *large* plant measuring 5,250 square feet. A table providing an overview of each design's capacity and details is provided on the next page. Pages 11 through 13 contain general considerations from the Iowa Meat & Poultry Inspection Bureau broken down by plant area. Page 14 contains comments and considerations specific to the designs contained in this book from veteran Iowa meat processors. Sanitation Performance Standards are included in the Appendix on page 63. These sections should provide food for thought about the needs of your own plant.

The designs for each plant are arranged in the following order:

- Floor Plan
- Plumbing Plan
- Electrical Plan
- Refrigeration Plan
- Equipment Plan
- Exterior Elevations Sketches
- Building Specifications

A key of respective icons is placed on the opposite page from each plan. Following the elevation sketches, building specifications are displayed in detailed tables by plant room. The small plant is displayed first, on page 17, followed by the large plant, beginning on page 41.

Questions about these designs can be directed to any of the following persons:

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Small Meat Processors Working Group
North Central Regional Center for Rural Development
108 Curtiss Hall
Iowa State University
Ames, IA 50011-1050
(515) 294-2882
arion@iastate.edu

Marcia and Kenneth Richmann, Executive Directors
Iowa Meat Processors Association
P.O. Box 334
Clarence, IA 52216
(563) 452-3329
kmrichmann@hotmail.com
## Plant Capacities and Utilities

<table>
<thead>
<tr>
<th></th>
<th>Small Plant</th>
<th>Large Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>50’ X 50’ + 10’ X 10’</td>
<td>70’ X 75’</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>2,600 sq. ft.</td>
<td>5,250 sq. ft.</td>
</tr>
<tr>
<td><strong>Holding Cooler Size</strong></td>
<td>13 Beef*</td>
<td>20 Beef*</td>
</tr>
<tr>
<td><strong>Pre-chill Cooler size</strong></td>
<td>7 Beef*</td>
<td>10 Beef*</td>
</tr>
<tr>
<td><strong>Number of Employees</strong></td>
<td>3 – 4</td>
<td>6 – 10</td>
</tr>
<tr>
<td><strong>Water Use and Output</strong></td>
<td>150-200 gallons per beef equivalent, average</td>
<td>Depends on equipment, consult a licensed electrician</td>
</tr>
<tr>
<td></td>
<td>One beef should be equivalent to 2 hogs, sheep, or goats</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical amp service needed</strong></td>
<td>Depends on equipment, consult a licensed electrician</td>
<td></td>
</tr>
<tr>
<td><strong>Possible interior materials</strong></td>
<td>Block tile, glass board, stainless steel, concrete block covered with epoxy paint**</td>
<td></td>
</tr>
<tr>
<td><strong>Possible exterior materials</strong></td>
<td>Steel siding, vinyl siding, cement board siding, tip-up concrete, insulated concrete forms</td>
<td></td>
</tr>
<tr>
<td><strong>Heating</strong></td>
<td>Options include forced warm air and hot water heating. Hot water heating is an excellent source of heating for plants. You can reclaim some heat from refrigeration compressors, and do not have to purchase a separate hot water heater. However hot water heating costs more and you will need air conditioning in certain areas (e.g. retail), so some type of forced air is still needed.</td>
<td></td>
</tr>
<tr>
<td><strong>Ventilation</strong></td>
<td>Proper ventilation is very important, as bad smells can taint products. Ventilation methods vary depending on the building materials used. Consult a licensed contractor.</td>
<td></td>
</tr>
<tr>
<td><strong>Vermin Barrier</strong></td>
<td>Proper construction will keep out most vermin. Sometimes an air curtain or another method is needed at exterior doors for fly control.</td>
<td></td>
</tr>
<tr>
<td><strong>Price per sq. ft.</strong></td>
<td>~$100, depending on materials used</td>
<td></td>
</tr>
<tr>
<td><strong>How might this plant be expanded?</strong></td>
<td>For both designs, the left-hand side of the plant could be extended to make more room that could be utilized for anything that would be needed, except slaughter.</td>
<td></td>
</tr>
</tbody>
</table>

* Cooler space for one beef will provide space for 1.5 to 2 hogs, sheep, or goats.

** When painting or touching up epoxy, it is critical to seal the area off from the rest of the plant to avoid contamination of food materials, finished products, and packaging.
General Plant Design Considerations from Iowa Meat & Poultry Inspection Bureau

These are provided as suggestions, NOT regulatory requirements. Iowa Meat & Poultry Inspection Bureau, USDA Food Safety and Inspection Service (FSIS), or your local food safety inspection agency will make the final determination if your plant meets all food safety regulatory requirements.

Animal Holding Areas
Construction of animal holding areas should address the following:
1. Unloading of animals.
2. Design of animal paths for fluid movement.
3. Ample space for animals of all sizes.
4. Availability of water for each animal.
5. Ventilation to provide proper cooling/heating.
7. Contact your regional Iowa State University Extension Livestock Specialist for more detailed information.

Slaughter Areas
Construction of slaughter areas should address the following:
1. Is there a sterilizer in the slaughter room?
2. Is the knock box in the slaughter able to withstand the animals that it is intended to hold?
3. Is there an adequate inspection pan and head loop for official slaughter rooms?
4. Do you have 50 foot candles at the inspection station on the slaughter floor?
5. Are the rails in slaughter and coolers located at an adequate height for the purpose intended? Is the bleeding rail height adequate?
6. Are toilet facilities located near slaughter floor to prevent slaughter room employees from traveling through plant.

Inedible Areas
Construction of inedible areas should address the following:
1. Inedible rooms need to limit access to the facility (e.g. an interior door for the establishment to place inedibles in the room and an exterior door for the rendering truck to pick up the inedibles without entering the plant).

Receiving and Shipping Areas
Construction of receiving and shipping areas should address the following:
1. Load out areas should be located so that product is not transported back through production areas.
2. Receiving and shipping areas should not open up into a processing room.
3. Receiving and shipping areas should be adjacent or close to where products/supplies are being stored.

Coolers and Freezers
Construction of cooler and freezer areas should address the following:
1. Are there separate coolers for storage of raw and cooked products?
2. Do the coolers have drains in them and are they adequately sized?

Storage Areas
Construction of storage areas should address the following:
1. Is there adequate storage for dry and non-meat ingredients.
2. Is there adequate storage for packaging and labeling supplies?
3. Is there storage for equipment?
4. Is there storage for maintenance tools?
5. Is there separate storage for cleaning tools, supplies, and chemicals—away from food?
6. Is there storage for employee belongings?

Processing Areas—
RAW, COOKED, SMOKEHOUSE
Construction of processing areas should address the following:
1. Are there separate areas for processing cooked and raw products?
2. Is the processing room refrigerated?
3. Is the smokehouse in a room by itself with a drain?
4. Do carcass rails lead all the way into the processing areas for convenience and safety of dropping carcasses to tables or work areas?
5. Are floors sloped to drains?
6. Consider placement of equipment for ease of transition from one machine to another, e.g., meat saw close to boning table.

Employee/Welfare Areas
Construction of welfare/employee areas should address the following:
1. Do the bathrooms have separate sewer lines until outside the building or is there a backflow preventative device?
2. Does the restroom have a self-closing door and ventilation that is turned on with the light?
3. Is there a bathroom that customers can use easily?
4. Is there a separate break area for employees?
5. Is there a separate storage area and refrigerator for employee food?
6. Consider the location of the management office within plant—should it be closer to the retail area, employee welfare area, production area? Where does management spend most time? Is other office space necessary?
7. If you operate under FSIS-inspection, a separate office area is needed. If Iowa-inspected, a work area and place to store plant files is needed.

Retail/Customer Areas
Construction of retail/customer areas should address the following:
1. Is the retail area sufficiently separated from processing areas?
2. Can customers pick up their products without causing contamination of processing areas?
3. Are finished product storage areas (e.g., freezer, ready-to-eat cooler) located close or adjacent to retail area (and/or to shipping area)?

Traffic Patterns
Traffic pattern items that should be considered:
1. Is the flow of the product from animal arriving to packaged meat leaving adequate to prevent contamination of areas or products?
2. Is the traffic flow for delivered goods adequate to prevent contamination in processing areas?
3. Are traffic patterns planned to retain separation of cooked and raw products—including people (employees and non-employees), equipment and product?
4. What paths do delivery or pick-up persons take within your plant? How do you prevent contamination from the outside?
Sewer and Water
Sewer and water items that should be considered:
1. Do you have a sewer certificate? (If hooked up to a municipal system, this would come from the city.)
2. Do you have the water tested at least annually? Does your city?
3. What is the source of the water for the plant? City water (public) or private well?
4. Are sewer pipes from toilets/welfare areas separate from sewer pipes from production areas?
5. Is there proper water disposal (sewer) to protect food production areas from contamination—backflow devices?

General Construction Considerations
1. Are the floors, walls, and ceilings in wet areas smooth, impervious to water, and easily cleanable?
2. Are doors and hallways wide enough for the intended purpose—people, product, and equipment movement—e.g., smokehouse trucks?
3. Are there hose bibs in wet areas so that proper washing can be performed?
4. If there are windows, are the windowsills built to prevent accumulation of debris and dirt (no ledges is preferred)?
5. Do the floors in wet areas slope toward the drains and are the drains adequate in size? Do the drains have adequate traps?
6. Are the hands-free handwash sinks located in areas where they will be easily accessible and useable?
7. Is the lighting adequate for the purpose and is it protected?
8. Is there a three compartment sink for cleaning equipment?
9. Will there be curbing around the rooms? What will it be constructed with and how will it be constructed to ensure cleanability and a good seal at the junction where the wall meets the floor?
10. Consider which direction doors open—freezers, coolers, etc.
11. Consider what type of doors are needed—swinging doors, lockable doors?
12. What type of security is needed?
13. Determine the volume of your business and growth of your business when determining the size of coolers, freezers, processing, storage areas, and retail areas.
14. Determine how plant can grow in the future with building additions.
15. Air flow (ventilation, heating, cooling, etc.) inside the plant should be addressed so that positive and negative air pressure are balanced and do not cause adverse situations in the plant—odor from animal holding pens/offal/slaughter area filtering to other parts of the plant. The retail packaging area should be positively pressurized to push air out into the rest of the plant.
16. Will any other operations be happening in the plant? Other non-meat food processing? Catering? Retail sales of non-meat foods and other items. What space is designated for those operations?
Comments from Veteran Iowa Meat Processors for Consideration Based Upon the Needs of Your Particular Business

These comments are made in relation to the plant designs contained in this book and will only make sense by referring to the respective plant design for each comment.

**For both plant designs:**
- You may want your freezers and/or coolers to be bigger or smaller based on the nature of your business.
- If you plan on a lot of retail business, you might want to design a larger retail area.
- You may not need both a public and an employee restroom.
- You may not need a door between your break room and the retail area.
- Depending on your ventilation set up, you may want to place your livestock pens and/or inedibles outside of the building. You should always have ventilators pulling air from these areas to the outside.
- Depending on your food safety inspection agency, you may only need to provide a desk with a locking file cabinet for your inspector, not a separate office.
- You may want a separate ready-to-eat packing area.
- You may want a laundry washing room/area.
- You may want your pens to be bigger and/or have a larger outside staging area.
- You may want a built-in finished product cooler with glass retail-display doors that open into your retail area, rather than a stand-alone retail cooler unit. (**Note:** “Finished Product Cooler” on both floor plans is ONLY for cooling product coming out of the smokehouse, NOT packaged and/or raw product.)

**For the small plant design:**
- For the freezer next to the retail area, you may want to have the door open in the other direction.
- You may want the offal cooler to have its own exterior door for after-hours pick-up.
- You will likely want a door between the processing area and the kill floor in order to move bone barrels into the offal cooler (for use only while the kill floor is clean and not in use).
- You may want an equipment wash sink in the processing area.
- If you plan to produce a lot of ready-to-eat product, you will likely want a vacuum packaging machine.

**For the large plant design:**
- If you personally will often be working in the retail area, you may want to position the office closer to it.
- You may want to place your meat saw closer to your boning table.
- You may want to make your freezer directly accessible from your retail area.
- If you have sufficient volume, you might consider a roll-stock packaging machine (or leave room for one in your designs should you wish to buy one later).
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor plan</td>
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<tr>
<td>Plumbing Symbol Key Plan</td>
<td>20</td>
</tr>
<tr>
<td>Plumbing Plan</td>
<td>21</td>
</tr>
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<td>Electrical Symbol Key Plan</td>
<td>22</td>
</tr>
<tr>
<td>Electrical Plan</td>
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<td>Refrigeration Symbol Key Plan</td>
<td>24</td>
</tr>
<tr>
<td>Refrigeration Plan</td>
<td>25</td>
</tr>
<tr>
<td>Equipment Symbol Key Plan</td>
<td>26</td>
</tr>
<tr>
<td>Equipment Plan</td>
<td>27</td>
</tr>
<tr>
<td>Exterior Elevation</td>
<td></td>
</tr>
<tr>
<td>Front Elevation</td>
<td>28</td>
</tr>
<tr>
<td>Back Elevation</td>
<td>29</td>
</tr>
<tr>
<td>Right Elevation</td>
<td>30</td>
</tr>
<tr>
<td>Left Elevation</td>
<td>31</td>
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<td>33</td>
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<tr>
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<td>36</td>
</tr>
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<td>Plumbing Specifications</td>
<td>37</td>
</tr>
<tr>
<td>Electrical Specifications</td>
<td>38</td>
</tr>
<tr>
<td>Refrigeration Room Specifications</td>
<td>39</td>
</tr>
</tbody>
</table>
Small Plant, Floor Plan (Not for Construction Use)
Plumbing Symbol Key Plan

- **4” PVS Sewer Line**
- **2” PVC Sewer Line**
- **Grease Interceptor**
  Size will be determined by gallons of water used daily
- **4” Floor Drain**
  Floor Sloped to Drain
- **2” Condensate Drain**
  for Refrigeration Evaporators
- **Hose Bib**
  Hot & Cold Domestic Water
- **Hand Wash Sink**
  with Knife Sterilizer
- **Equipment Wash Sink**
- **Trench Drain with Floor Sloped to Drain**
- **Shower**
  32” x 32”
Small Plant, Plumbing Plan (Not for Construction Use)
Electrical Symbol Key Plan

- Fluorescent Light (8', Vapor Tight, High Output, T-8)
- Fluorescent Light (4', Vapor Tight, High Output, T-8)
- Emergency Lights
- Lighted Exit Signs
- Incandescent Jar Lights
- GFI Outlet 115v
- Regular Outlet 115v
- 208, 220, 230 v outlet
- Light Switch
- Light Switch 3-Way
- Rest Room Exhaust Fan
- Electrical Panel
- Exhaust Fan
Refrigeration Symbol Key Plan

- Compressor Condenser Unit
- Freon Line
- Evaporator Drain Line
- Evaporator
Equipment Symbol Key Plan

- Beef Cradle
- Boning Table
- Curing Tub
- Grinder
- Inedible Barrel
- 8' Meat Case
- Mixer
- Power Washer
- 2-Door Freezer or Cooler
- Wrapping Table
- Kill Chute
- Smoke Generator
- Smoke House 1-Truck
- Smoke Truck
- Meat Saw
- Tumbler
- Stuffer
- Stuffing Table
- Breaking Table
Small Plant, Equipment Plan (Not for Construction Use)
Small Plant, Front Elevation (Not for Construction Use)
Small Plant, Back Elevation (Not for Construction Use)
Small Plant, Right Elevation (Not for Construction Use)
Small Plant, Left Elevation (Not for Construction Use)
Building Specifications

Small Plant Design
# Room Finish Schedule

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Floor</th>
<th>Base</th>
<th>Walls N</th>
<th>Walls E</th>
<th>Walls S</th>
<th>Walls W</th>
<th>Ceiling</th>
<th>Ceiling Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>101</td>
<td>Freezer</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>102</td>
<td>Dry Storage</td>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>103</td>
<td>Public Rest Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>104</td>
<td>Employee Rest Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>106</td>
<td>Break Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>107</td>
<td>Kill Floor</td>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>14'</td>
</tr>
<tr>
<td>108</td>
<td>Kill Floor Cupola</td>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
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<td>18'</td>
</tr>
<tr>
<td>109</td>
<td>Holding Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>14'</td>
</tr>
<tr>
<td>110</td>
<td>Processing Area</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>111</td>
<td>Mixing &amp; Stuffing Area</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>112</td>
<td>Curing Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>114</td>
<td>Smoke Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>115</td>
<td>Mechanical Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>116</td>
<td>Offal Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>117</td>
<td>Pens</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
</tbody>
</table>

### Laminated Product

- Fluted Polypropylene, .400" back
- .05" sealed fiberglass reinforced plastic (FRP) panel, single sided skin
- (Glasbord is a tradename for FRP)

### PVC Trim Boards

- 1/2" thick x 3" wide
- 22.5° angle cut on top (minimum)
# Door Schedule

<table>
<thead>
<tr>
<th>Door No.</th>
<th>Room</th>
<th>Size Width</th>
<th>Size Height</th>
<th>Material Type</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entry</td>
<td>6'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Glass</td>
<td>Factory</td>
<td>Lockable</td>
</tr>
<tr>
<td>2</td>
<td>Freezer</td>
<td>4'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Freezer Door</td>
</tr>
<tr>
<td>3</td>
<td>Retail Area</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>4</td>
<td>Public Rest Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable Inside</td>
</tr>
<tr>
<td>5</td>
<td>Retail Area</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>6</td>
<td>Employee Rest Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable Inside</td>
</tr>
<tr>
<td>7</td>
<td>Office</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable w/Dead bolt</td>
</tr>
<tr>
<td>8</td>
<td>Break Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>9</td>
<td>Kill Floor</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>10</td>
<td>Pens</td>
<td>3'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Insulated Roll up Door (Lockable)</td>
</tr>
<tr>
<td>11</td>
<td>Pens</td>
<td>3'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Insulated Roll up Door (Lockable)</td>
</tr>
<tr>
<td>12</td>
<td>Kill Floor</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>13</td>
<td>Offal Cooler</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>14</td>
<td>Pre chill Cooler</td>
<td>5'-0&quot;</td>
<td>10'-6&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>15</td>
<td>Holding Cooler</td>
<td>5'-0&quot;</td>
<td>11'-8&quot;</td>
<td>Steel</td>
<td>Clear</td>
<td>Double Swing</td>
</tr>
<tr>
<td>16</td>
<td>Holding Cooler</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>17</td>
<td>Dry Storage</td>
<td>2'-8&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>18</td>
<td>Mixing &amp; Stuffing Area</td>
<td>4'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>19</td>
<td>Curing Cooler</td>
<td>4'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>20</td>
<td>Finished Product Cooler</td>
<td>4'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>21</td>
<td>Smoke Room</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>22</td>
<td>Mechanical Room</td>
<td>6'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Overhead Steel Insulated (Lockable)</td>
</tr>
</tbody>
</table>

**NOTE:** Owner may need to furnish cooler doors, freezer door, and double swing doors to contractor.
## Concrete Finish Schedule

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Floor Drains</th>
<th>Insulation Thickness Under floor</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>Freezer</td>
<td>0</td>
<td>8”</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Dry Storage</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Public Rest Room</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>Employee Rest Room</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Break Area</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Kill Floor</td>
<td>1</td>
<td></td>
<td>Trench Drain</td>
</tr>
<tr>
<td>108</td>
<td>Pre chill Cooler</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>Holding Cooler</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Processing room</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Mixing &amp; Stuffing Area</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Curing Cooler</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Smoke Room</td>
<td>1</td>
<td></td>
<td>Trench Drain</td>
</tr>
<tr>
<td>115</td>
<td>Mechanical Room</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Offal Cooler</td>
<td>1</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>Pens</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
- All floors will be concrete with a non-slip finish (4000A).
- All floors 5” thick with rebar spaced at 2’ on center and places on 2-1/2” chairs.
- Floor slopes to drains have to be 3/16” per foot or greater (no standing water on floors).
- Under floor insulation must have a density of 2.5 lbs. per cubic foot or 2” thick equals R-value of R-10.
- Ground under insulated floors must be properly bedded with gravel and/or sand for proper ventilation to avoid ice heaving.
# Plumbing Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Room Size</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>17’x14’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td>103</td>
<td>Public Rest Room</td>
<td>7’x6’x10’</td>
<td>1 Toilet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td>104</td>
<td>Employee Rest Room</td>
<td>5’x9’x10’</td>
<td>1 Toilet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enclosed Shower</td>
</tr>
<tr>
<td>106</td>
<td>Break Area</td>
<td>15’x10’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>107</td>
<td>Kill Floor</td>
<td>21’x12’x14’</td>
<td>1 Floor Drain (Trench Drain)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 sets of Hose Bibs (Hot &amp; Cold domestic water)</td>
</tr>
<tr>
<td>108</td>
<td>Pre chill Cooler</td>
<td>8’x14’6”x14’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>109</td>
<td>Holding Cooler</td>
<td>14’x14’6”x14’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>110</td>
<td>Processing room</td>
<td>25’x11’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Condensate Drain (On sink drain)</td>
</tr>
<tr>
<td>111</td>
<td>Mixing &amp; Stuffing Area</td>
<td>14’x12’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Equipment wash sink (3 compartment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mount handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Condensate Drain (On sink drain)</td>
</tr>
<tr>
<td>112</td>
<td>Curing Cooler</td>
<td>8’6”x10’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>5’x7’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Condensate Drain</td>
</tr>
<tr>
<td>114</td>
<td>Smoke Room</td>
<td>8’x16’x10’</td>
<td>1 Floor Drain (Trench Drain)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Set of Hose Bibs (Hot &amp; Cold Domestic water)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cold domestic water hook-up to smokehouse</td>
</tr>
<tr>
<td>115</td>
<td>Mechanical Room</td>
<td>8’x17’x10’</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water Main</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Set of Hose Bibs (Hot &amp; Cold Domestic water)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water Heater</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power washer hook-up</td>
</tr>
<tr>
<td>116</td>
<td>Offal Cooler</td>
<td>8’x8’x10’</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>117</td>
<td>Pens</td>
<td>10’x10’x10’</td>
<td>1 Floor Drain</td>
</tr>
</tbody>
</table>

Owner may need to supply wall mount hand wash sinks & equipment wash sinks to contractor.

**NOTES:**
- All plumbing to meet state and local codes.
- All floor drain and risers to be 4” diameter.
- Condensate drains for refrigeration need to be 2” diameter lines.
- Public and employee rest rooms must be a separate drain line out of building.
- All water lines surface mounted in plant.
- All water lines 1/2” or larger diameter.
- All floor drains need covers and must have deep seal trap and properly vented.
## Electrical Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Lighting Type</th>
<th>Lighting FCP</th>
<th>Switches</th>
<th>Outlets 115v</th>
<th>Outlets 220v</th>
<th>Exhaust Fan</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>3</td>
<td>2</td>
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<td>Needs a night light</td>
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<tr>
<td>101</td>
<td>Freezer</td>
<td>Incandescent</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Light switch in Retail Room</td>
</tr>
<tr>
<td>102</td>
<td>Dry Storage</td>
<td>4' VT, HO T8</td>
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<td>1</td>
<td>1</td>
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<td></td>
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<tr>
<td>103</td>
<td>Public Rest Room</td>
<td>4' VT, HO T8</td>
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<td>1</td>
<td>1 GFI</td>
<td>1</td>
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<tr>
<td>104</td>
<td>Employee Rest Room</td>
<td>4' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Exhaust fan on with light</td>
</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>4' VT, HO T8</td>
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<td>1</td>
<td>4</td>
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<td></td>
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</tr>
<tr>
<td>106</td>
<td>Break Area</td>
<td>4' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Kill Floor</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>4</td>
<td>3 GFI</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Pre chill Cooler</td>
<td>8' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Light switch in Kill Floor</td>
</tr>
<tr>
<td>109</td>
<td>Holding Cooler</td>
<td>8' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Light switch in Process Room</td>
</tr>
<tr>
<td>110</td>
<td>Processing Room</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>2 GFI</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Mixing &amp; Stuffing Area</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Lights on with Process Room lights</td>
</tr>
<tr>
<td>112</td>
<td>Curing Cooler</td>
<td>8' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td>Light switch in hallway</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>4' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Light switch in hallway</td>
</tr>
<tr>
<td>114</td>
<td>Smoke Room</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>3 GFI</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Mechanical Room</td>
<td>8' VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>3 GFI</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Offal Cooler</td>
<td>4' VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td></td>
<td>Light switch in Kill Floor</td>
</tr>
<tr>
<td>117</td>
<td>Pens</td>
<td>8' VT, HO T8</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light switch in Kill Floor</td>
</tr>
</tbody>
</table>

**NOTES:**
- Lights shown on drawing are only showing placement between rails, beams, etc. (may need more or less lights).
- Owner may change lighting type, but lighting foot candle power (FCP) must be at least what is shown on specifications.
- Need lighted exit signs wherever needed by code.
- Need emergency lighting wherever needed by code.
- All pvc conduit used in all rooms (metal conduit can be used in mechanical room and above ceilings only).
- No #14 wire used.
- Must bid Square D equipment only.
- GFI outlets must have lighted trip light.
- This specification sheet does not include any refrigeration electrical needs (will be provided by refrigeration supplier).
### Refrigeration Room Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Room Size</th>
<th>Ceiling R-value</th>
<th>Walls R-value</th>
<th>Floor R-value</th>
<th>Workers in room</th>
<th>Product Temp in</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Freezer</td>
<td>14’x9’x10’</td>
<td>30</td>
<td>23</td>
<td>40</td>
<td>0</td>
<td>50°F</td>
<td>0°F Run room temp at 0 - 10°F Freezer 2000# in 24 hours</td>
</tr>
<tr>
<td>108</td>
<td>Pre chill Cooler</td>
<td>8’x14’6”x14’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>100°F</td>
<td>36°F Cool 5000# product in 24 hours</td>
</tr>
<tr>
<td>109</td>
<td>Holding Cooler</td>
<td>14’x14’6”x14’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>40°F</td>
<td>34°F Hold product at 34°F Up to 15000# product</td>
</tr>
<tr>
<td>110</td>
<td>Processing Room</td>
<td>24’x11’x10’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>5</td>
<td>40°F</td>
<td>40°F Run room temp at 55°F</td>
</tr>
<tr>
<td>111</td>
<td>Mixing &amp; Stuffing Area</td>
<td>14’x12’x10’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>3</td>
<td>40°F</td>
<td>50°F Run room temp at 55°F</td>
</tr>
<tr>
<td>112</td>
<td>Curing Cooler</td>
<td>8’6”x10’x10’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>50°F</td>
<td>36°F Hold product at 34-36°F</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>5’x7’x10’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>120°F</td>
<td>40°F 2000# product in 12 hours</td>
</tr>
<tr>
<td>116</td>
<td>Offal Cooler</td>
<td>8’x8’x10’</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>100°F</td>
<td>50-60°F Run room temp at 50°F 3000# product in 48 hours</td>
</tr>
</tbody>
</table>

**NOTES:**
- Need to supply electrical needs for refrigeration to electrical contractor.
- Refrigeration lines should be insulated and covered with PVC or other sealed vapor barrier to avoid condensation.
Large Plant Design—5,250 square feet

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Large Plant, Floor Plan (Not for Construction Use)
Plumbing Symbol Key Plan

- **4" PVC Sewer Line**
- **2" PVC Sewer Line**
- **Grease Interceptor** Size will be determined by gallons of water used daily
- **4" Floor Drain** Floor Sloped to Drain
- **2" Condensate Drain** for Refrigeration Evaporators

**Hose Bib** Hot & Cold Domestic Water

**Hand Wash Sink with Knife Sterilizer**

**Equipment Wash Sink**

**Trench Drain with Floor Sloped to Drain**

**Shower 32" x 32"**
Large Plant, Plumbing Plan (Not for Construction Use)
Electrical Symbol Key Plan

- Fluorescent Light (8’, Vapor Tight, High Output, T-8)
- Fluorescent Light (4’, Vapor Tight, High Output, T-8)
- Emergency Lights
- Lighted Exit Signs
- Incandescent Jar Lights
- GFI Outlet 115v
- Regular Outlet 115v
- 208, 220, 230 v outlet
- Light Switch
- Light Switch 3-Way
- Rest Room Exhaust Fan
- Electrical Panel
- Exhaust Fan
Large Plant, Electrical Plan (Not for Construction Use)
Refrigeration Symbol Key Plan

Compressor Condenser Unit

Freon Line

Evaporator Drain Line

Evaporator
Large Plant, Refrigeration Plan (Not for Construction Use)
Equipment Symbol Key Plan

- Beef Cradle
- Boning Table
- Curing Tub
- Grinder
- Inedible Barrel
- 8' Meat Case
- Power Washer
- 2-Door Freezer or Cooler
- Wrapping Table
- Kill Chute
- Smoke Generator
- Smoke House 1-Truck
- Smoke Truck
- Meat Saw
- Tumbler
- Stuffer
- Stuffing Table
- Breaking Table
Large Plant, Equipment Plan (Not for Construction Use)
Large Plant, Front Elevation (Not for Construction Use)
Large Plant, Back Elevation (Not for Construction Use)
Large Plant, Right Elevation (Not for Construction Use)
Large Plant, Left Elevation (Not for Construction Use)
Building Specifications

Large Plant Design
## Room Finish Schedule

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Floor</th>
<th>Base</th>
<th>Walls N</th>
<th>Walls E</th>
<th>Walls S</th>
<th>Walls W</th>
<th>Ceiling</th>
<th>Ceiling Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>101</td>
<td>Public Rest Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>102</td>
<td>Employee Rest Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>103</td>
<td>Break Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>104</td>
<td>Processing Room</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>106</td>
<td>Inspection Office</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>107</td>
<td>Dry Storage</td>
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<td>FRP</td>
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<td>FRP</td>
<td>FRP</td>
<td>14'</td>
</tr>
<tr>
<td>108</td>
<td>Hallway</td>
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<td>PVC cove</td>
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<td>14'</td>
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<tr>
<td>109</td>
<td>Curing Cooler</td>
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<td>PVC cove</td>
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<td>FRP</td>
<td>FRP</td>
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<td>14'</td>
</tr>
<tr>
<td>110</td>
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<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>111</td>
<td>Sausage Kitchen</td>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
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<tr>
<td>112</td>
<td>Smoke Room</td>
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<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>114</td>
<td>Pens</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
<tr>
<td>115</td>
<td>Kill Floor</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>14'</td>
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<tr>
<td>116</td>
<td>Kill Floor Cupalo</td>
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<td>PVC cove</td>
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<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>18'</td>
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<tr>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>14'</td>
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<tr>
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<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>14'</td>
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<tr>
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<td>Inedible Cooler</td>
<td>concrete</td>
<td>PVC cove</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
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<tr>
<td>120</td>
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<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
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<tr>
<td>121</td>
<td>Mechanical Room</td>
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<td>FRP</td>
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<td>FRP</td>
<td>FRP</td>
<td>10'</td>
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<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>FRP</td>
<td>10'</td>
</tr>
</tbody>
</table>

Laminated Product
Fluted Polypropylene .400" back
.05" sealed fiberglass reinforced plastic (FRP) panel, single sided skin

(Glasbord is a tradename for FRP)

PVC Trim Boards
1/2" thick x 3" wide
22.5° angle cut on top (minimum)

FRP
## Door Schedule

<table>
<thead>
<tr>
<th>Door No.</th>
<th>Room</th>
<th>Size Width</th>
<th>Size Height</th>
<th>Material Type</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entry</td>
<td>6'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Glass</td>
<td>Factory</td>
<td>Lockable/Dead bolt</td>
</tr>
<tr>
<td>2</td>
<td>Public Rest Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable Inside</td>
</tr>
<tr>
<td>3</td>
<td>Break room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>4</td>
<td>Employee Rest Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable Inside</td>
</tr>
<tr>
<td>5</td>
<td>Break Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable/Dead bolt</td>
</tr>
<tr>
<td>6</td>
<td>Retail Room</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>7</td>
<td>Freezer</td>
<td>5'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Freezer Door</td>
</tr>
<tr>
<td>8</td>
<td>Retail Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>9</td>
<td>Retail Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>10</td>
<td>Processing Room</td>
<td>5'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>11</td>
<td>Processing Room</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Double Swing</td>
</tr>
<tr>
<td>12</td>
<td>Hallway</td>
<td>4'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Double Swing</td>
</tr>
<tr>
<td>13</td>
<td>Office</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable/Dead bolt</td>
</tr>
<tr>
<td>14</td>
<td>Inspection Office</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable</td>
</tr>
<tr>
<td>15</td>
<td>Dry Storage</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable/Dead bolt</td>
</tr>
<tr>
<td>16</td>
<td>Kill Floor</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>17</td>
<td>Sausage Kitchen</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>18</td>
<td>Curing Cooler</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>19</td>
<td>Seasoning Room</td>
<td>2'-8&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>20</td>
<td>Smoke Room</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>SS</td>
<td>Double Swing</td>
</tr>
<tr>
<td>21</td>
<td>Finished Product Cooler</td>
<td>5'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>22</td>
<td>Pens</td>
<td>3'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Roll up Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>23</td>
<td>Pens</td>
<td>3'-0&quot;</td>
<td>7'-0&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Roll up Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>24</td>
<td>Pre chill Cooler</td>
<td>5'-0&quot;</td>
<td>10'-6&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>25</td>
<td>Holding Cooler</td>
<td>5'-0&quot;</td>
<td>11'-8&quot;</td>
<td>Steel</td>
<td>Clear</td>
<td>Double Swing</td>
</tr>
<tr>
<td>26</td>
<td>Inedible Cooler</td>
<td>4'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Cooler Door</td>
</tr>
<tr>
<td>27</td>
<td>Inedible Cooler</td>
<td>8'-0&quot;</td>
<td>8'-0&quot;</td>
<td>Steel</td>
<td>Factory</td>
<td>Overhead Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>28</td>
<td>Mechanical Room</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>No Knob (Push &amp; Pull handle)</td>
</tr>
<tr>
<td>29</td>
<td>Rest Room</td>
<td>2'-6&quot;</td>
<td>6'-8&quot;</td>
<td>Steel</td>
<td>Painted</td>
<td>Lockable Inside</td>
</tr>
<tr>
<td>30</td>
<td>Mechanical Room</td>
<td>8'-0&quot;</td>
<td>8'-0&quot;</td>
<td>Steel</td>
<td>Factory</td>
<td>Overhead Steel Insulated (Lockable)</td>
</tr>
<tr>
<td>31</td>
<td>Freezer</td>
<td>3'-0&quot;</td>
<td>6'-8&quot;</td>
<td>Wood</td>
<td>Factory</td>
<td>Insulated Freezer Door</td>
</tr>
</tbody>
</table>

**NOTE:** Owner may need to furnish cooler doors, freezer door, and double swing doors to contractor.
# Concrete Finish Schedule

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Floor Drains</th>
<th>Insulation Thickness Under floor</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>101</td>
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<td>0</td>
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</tr>
<tr>
<td>102</td>
<td>Employee Rest Room</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Break Area</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>Processing Room</td>
<td>1</td>
<td>2&quot;</td>
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</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Inspection Office</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Dry Storage</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Hallway</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>Curing Cooler</td>
<td>1</td>
<td>2&quot;</td>
<td>Trench Drain</td>
</tr>
<tr>
<td>110</td>
<td>Seasoning Room</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Sausage Kitchen</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Smoke Room</td>
<td>1</td>
<td>2&quot;</td>
<td>Trench Drain</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Pens</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Kill Floor</td>
<td>1</td>
<td>2&quot;</td>
<td>Trench Drain</td>
</tr>
<tr>
<td>116</td>
<td>Pre chill Cooler</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>Holding Cooler</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>Inedible Cooler</td>
<td>1</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>Rest Room</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>Mechanical Room</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>121</td>
<td>Freezer</td>
<td>0</td>
<td>8&quot;</td>
<td></td>
</tr>
<tr>
<td>122</td>
<td>Sharp Freezer</td>
<td>0</td>
<td>8&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
- All Floors will be concrete with a non-slip finish (4000A).
- All floors 5" thick with rebar spaced at 2' on center and places on 2-1/2" chairs.
- Floor slopes to drains have to be 3/16" per foot or greater (no standing water on floors).
- Under floor insulation must have a density of 2.5 lbs. per cubic foot or 2" thick equals R-value of R-10.
- Ground under insulated floors must be properly bedded with gravel and/or sand for proper ventilation to avoid ice heaving.
## Plumbing Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Room Size</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>14'x32'x10'</td>
<td>1 Floor Drain and 1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td>101</td>
<td>Public Rest Room</td>
<td>7'x5'x10'</td>
<td>1 Toilet and 1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td>102</td>
<td>Employee Rest Room</td>
<td>9'8&quot;x5'x10'</td>
<td>1 Toilet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enclosed Shower</td>
</tr>
<tr>
<td>103</td>
<td>Break Room</td>
<td>16'x17'x10'</td>
<td>Kitchen Sink and 1 Condensate Drain</td>
</tr>
<tr>
<td>104</td>
<td>Processing Room</td>
<td>14'x28'x10'</td>
<td>1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 set of Hose Bibs (Hot &amp; Cold domestic water)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Equipment Wash Sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>108</td>
<td>Hallway</td>
<td>5'x17'x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>109</td>
<td>Curing Cooler</td>
<td>9'x12'x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>111</td>
<td>Sausage Kitchen</td>
<td>17'x28'x10'</td>
<td>1 set of Hose Bibs (Hot &amp; Cold domestic water)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Equipment Wash Sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Condensate Drain</td>
</tr>
<tr>
<td>112</td>
<td>Smoke Rooms</td>
<td>10'x12'x10'</td>
<td>1 Floor Drain (Trench)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Cold water hookup for smokehouse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Cold water hookup for kettle</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product Cooler</td>
<td>6'8&quot;x12'x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>114</td>
<td>Pens</td>
<td>16'x17'x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>115</td>
<td>Kill Floor Kill Floor Cupalo</td>
<td>16'x22'x14'</td>
<td>1 Floor Drain (Trench)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4'x22'x18'</td>
<td>2 Wall-mounted handwash sinks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 sets of Hose Bibs (Hot &amp; Cold domestic water)</td>
</tr>
<tr>
<td>116</td>
<td>Pre chill Cooler</td>
<td>11'6&quot;x16'x14'</td>
<td>1 Floor Drain and 1 Condensate Drain</td>
</tr>
<tr>
<td>117</td>
<td>Holding Cooler</td>
<td>11'x18'x14'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td>118</td>
<td>Inedible Cooler</td>
<td>12'17'x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Condensate Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 sets of Hose Bibs (Hot &amp; Cold domestic water)</td>
</tr>
<tr>
<td>119</td>
<td>Rest Room</td>
<td>5'x5'x10'</td>
<td>1 Toilet and 1 Wall-mounted handwash sink</td>
</tr>
<tr>
<td>120</td>
<td>Mechanical Room</td>
<td>17'x22'7&quot;x10'</td>
<td>1 Floor Drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water Main &amp; Water Heater hookups</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power washer hookup</td>
</tr>
</tbody>
</table>

Owner may need to supply wall mount hand wash sinks and equipment wash sinks to contractor.

**NOTES:**
- All plumbing to meet state and local codes.
- All floor drain and risers to be 4" diameter.
- Condensate drains for refrigeration need to be 2" diameter lines.
- Public and employee rest rooms must be a separate drain line out of building.
- All water lines surface mounted in plant.
- All water lines 1/2" or larger diameter.
- All floor drains need covers and must have deep seal trap and properly vented.
## Electrical Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Lighting Type</th>
<th>Lighting FCP</th>
<th>Switches</th>
<th>Outlets 115v</th>
<th>Outlets 220v</th>
<th>Exhaust Fan</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Retail Area</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td>Needs a night light</td>
</tr>
<tr>
<td>101</td>
<td>Public Rest Room</td>
<td>4’VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td>1</td>
<td>Fan on with light</td>
</tr>
<tr>
<td>102</td>
<td>Employee Rest Room</td>
<td>4’VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
<td>1</td>
<td>1</td>
<td>Fan on with light</td>
</tr>
<tr>
<td>103</td>
<td>Break Room</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>4</td>
<td>1 GFI</td>
<td>1</td>
<td>Fan on with light</td>
</tr>
<tr>
<td>104</td>
<td>Processing Room</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Office</td>
<td>4’VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Inspection Office</td>
<td>4’VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Dry Storage</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Hallway</td>
<td>8’VT, HO T8</td>
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<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>Lights on with Dry Storage light</td>
</tr>
<tr>
<td>109</td>
<td>Curing Cooler</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>110</td>
<td>Seasoning Room</td>
<td>8’VT, HO T8</td>
<td>50</td>
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<td>3</td>
<td></td>
<td></td>
<td>Outlets on separate circuits</td>
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<td>Sausage Kitchen</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Smoke Room</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>Smoke house needs disconnect box</td>
</tr>
<tr>
<td>113</td>
<td>Finished Product</td>
<td>4’VT, HO T8</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light switch in Smoke Room</td>
</tr>
<tr>
<td>114</td>
<td>Pens</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>Light &amp; Fan switch in Kill Floor</td>
</tr>
<tr>
<td>115</td>
<td>Kill Floor</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>Light switch in Kill Floor</td>
</tr>
<tr>
<td>116</td>
<td>Pre chill Cooler</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light switch in Kill Floor</td>
</tr>
<tr>
<td>117</td>
<td>Holding Cooler</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light switch in Processing Room</td>
</tr>
<tr>
<td>118</td>
<td>Inedible Cooler</td>
<td>8’VT, HO T8</td>
<td>30</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>Rest Room</td>
<td>Incandescent</td>
<td>30</td>
<td>1</td>
<td>1 GFI</td>
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<td></td>
</tr>
<tr>
<td>120</td>
<td>Mechanical Room</td>
<td>8’VT, HO T8</td>
<td>50</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>Main Power and Panels</td>
</tr>
<tr>
<td>121</td>
<td>Freezer</td>
<td>Incandescent</td>
<td>30</td>
<td>1</td>
<td></td>
<td></td>
<td>1 switch in Mechanical Room</td>
<td></td>
</tr>
<tr>
<td>122</td>
<td>Sharp Freezer</td>
<td>Incandescent</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>Lights on with Freezer lights</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

- Lights shown on drawing are only showing placement between rails, beams, etc. (may need more or less lights).
- Owner may change lighting type, but lighting foot candle power (FCP) must be at least what is shown on specifications.
- Need lighted exit signs and emergency lighting wherever needed by code.
- All pvc conduit used in all rooms (metal conduit can be used in mechanical room and above ceilings only).
- No #14 wire used.
- Must bid Square D equipment only.
- GFI outlets must have lighted trip light.
- This specification sheet does not include any refrigeration electrical needs (will be provided by refrigeration supplier).
### Refrigeration Room Specifications

<table>
<thead>
<tr>
<th>Room No.</th>
<th>Room Name</th>
<th>Room Size</th>
<th>Ceiling R-value</th>
<th>Walls R-value</th>
<th>Floor R-value</th>
<th>Workers in room</th>
<th>Product Temp in</th>
<th>Product Temp out</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>Processing Room</td>
<td>14'x28'x10'</td>
<td>30</td>
<td>23</td>
<td>40</td>
<td>6</td>
<td>40°F</td>
<td>45°F</td>
<td>Run room temp at 55°F</td>
</tr>
<tr>
<td>109</td>
<td>Curing Cooler</td>
<td>9'x12'x10'</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>50°F</td>
<td>36°F</td>
<td>Cool 1500# product in 24 hours</td>
</tr>
<tr>
<td>111</td>
<td>Sausage Kitchen</td>
<td>17'x28'x10'</td>
<td>30</td>
<td>23</td>
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<td>3</td>
<td>40°F</td>
<td>55°F</td>
<td>Run room temp at 55°F</td>
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<td>113</td>
<td>Finished Product Cooler</td>
<td>6'7&quot;x12'x10'</td>
<td>30</td>
<td>23</td>
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<td>120°F</td>
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<td>Pre chill Cooler</td>
<td>11'6&quot;x16'x14'</td>
<td>30</td>
<td>23</td>
<td>10</td>
<td>0</td>
<td>100°F</td>
<td>40°F</td>
<td>Cool 6000# in 24 hours</td>
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<td>117</td>
<td>Holding Cooler</td>
<td>11'x28'x14'</td>
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<td>40°F</td>
<td>34°F</td>
<td>Hold 20000# at 34-36°F</td>
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<td>100°F</td>
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<td>Run room temp at 50°F, 6000# product in 48 hours</td>
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<tr>
<td>121</td>
<td>Freezer</td>
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<td>40</td>
<td>0</td>
<td>20°F</td>
<td>20°F</td>
<td>3000# in 12 hours</td>
</tr>
</tbody>
</table>

**NOTES:**
- Need to supply electrical needs for refrigeration to electrical contractor.
- Refrigeration lines should be insulated and covered with PVC or other sealed vapor barrier to avoid condensation.
(8) Beef and Pork Whole Animal Buying Guide

The Beef and Pork Whole Animal Buying Guide was designed to function in a somewhat similar way to the Guide to Designing a Small Red Meat Plant, with home and institutional buyers as the target audience instead of meat processors. The Buying Guide was designed with the intention of expanding the direct market for whole animals (and fractions thereof) from small meat processors and livestock producers – the ‘bread and butter’ of small meat processors.

Joe Cordray and I developed the idea for this publication, based on small meat processors consistently being asked the same questions by customers. Other members of the group embraced the idea quickly. The outline for this document was developed as a group, on a conference call. I recruited Kristine Jepsen, the second author, to draft certain sections of the outline based on her work marketing meat for her business, Grassrun Farm in NE Iowa. This guide went through several drafts as a group, additional helpful comments were provided by reviewers from the Iowa Beef Industry Council and the Iowa Pork Producers Association (part of the reason for asking these groups to review the guide was to get their help in promoting it). Joe Cordray was tireless in perfecting this guide, seeing that the intended audience was much broader than both previous publications. He and I worked up to “Final Version 6” before the guide was ready for publication. As is noted in the text, the meat cut images were provided courtesy of the National Cattlemen’s Beef Association and the National Pork Board. And, as with the two prior publications, the North Central Regional Center for Rural Development provided very valuable in-kind support through Kristi Hetland artful layout and graphic design.

The Buying Guide is less of a knowledge management tool than either of the two previous publications. While the Buying Guide does ask questions and discuss ways of thinking about options, its primary aim is to disseminate explicit information about how to buy a whole, half, or quarter of beef or a hog.
Yet, the *Buying Guide* is very clearly focused on supporting civic agriculture. It is a conversation starter to connect actors across local meat supply chains. It brings buyers up to level where they can start asking the right questions to uncover more tacit details about livestock production and processing. It clearly answers the most common questions about buying beef and pork as quarters, halves, and wholes. If a meat processor gives a copy of the *Buying Guide* to a potential new customer, that customer can then come back and have a more detailed and informed discussion with the processor. In this sense the *Buying Guide* is a very grounded document with clear, contextualized intentions – not a document for the sake of documentism, a compartmentalized, bureaucratic answer (Wenger, McDermott, and Snyder 2002:147-8). These scholars discuss how such tools are often necessary to bring new CoP members up to speed so that the same territory is not covered over and over again.

This publication has been well received both in Iowa and nationally by diverse audiences. This publication is very likely the only publication ever to be positively reviewed in both the newsletter of the American Association of Meat Processors and Mother Earth News. Review of this publication by USDA-FSIS prompted them to develop an additional agreement with ISU to reprint it and make it available free to the public, as the *Design Guide*. 
BEEF and PORK
Whole Animal Buying Guide

Published by the Small Meat Processors Working Group
April 2009

IOWA STATE UNIVERSITY
University Extension

PM 2076
Beef and Pork Whole Animal Meat Buying Guide

By Arion Thiboumery, Iowa State University, and Kristine Jepsen, Grass Run Farm, Dorchester, Iowa
Designed by Kristi Hetland, North Central Regional Center for Rural Development

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Introduction

The values and costs of buying meat directly from producers

Just a few decades ago, many Americans put up whole animals every year. Professional butchers traveled door-to-door, helping families cut and preserve the meat. Those folks who did not have their own animals to butcher contracted with a butcher shop, usually purchasing meat in quantity and storing it in a freezer locker to which the buyers had a key and access throughout the week.

Meat counters in grocery stores replaced this system, making it possible to purchase fresh meats week by week. But today, as more and more beef and pork producers return to the marketplace to sell directly to consumers, it is again common for individuals to buy meats locally and in quantity—typically by quarter, half, or whole animals.

Buying beef or pork in quantity allows you to choose not only what quality of animal you would like—how the animal is raised and fed, what breed—but also exactly how you want the meat cut and packaged. How thick do you want your steaks, for example? Do you want ground meat in one-pound packages, two-pound packages or made into patties? Do you want beef jerky, bratwurst, or ring bologna?

What Does It Cost?

Most of the time, buying a whole animal or part of an animal will be cheaper than if you were to buy the same meat as individual retail cuts—there is an economy to buying in bulk. To estimate the cost of buying directly from a farmer, consider the following:

1. How much does the animal itself cost? Many producers estimate costs on the weight of the animal’s carcass before it is cut into packaged meats—called the “carcass weight” or “hanging weight.” Some producers charge based on the live weight of the animal. Be sure to ask the producer how you will be charged. Prices may vary widely depending on the animal.

2. How much is the processing? This cost depends on the types of cuts you request, the amount of further processing requested (such as bacon or jerky), and type of packaging. For example, it is less expensive to leave roasts whole than it is to process them into tenderized steaks, ground beef patties, or stir-fry beef. Also, it is generally less expensive to wrap your meat in freezer paper than it is to have it vacuum-packaged.

3. If needed, what does storage or delivery cost? If you are unable to pick up all of your meat at once, you may be charged for freezer storage. Or, if your meat is to be delivered or shipped, be sure to ask how much extra the service will cost.

4. Do you need to invest in a freezer? As a general guide, 50 pounds of meat will fit in about 2.25 cu.ft. of cooler/freezer space. Meat from one-eighth of a typical beef will weigh roughly 50-60 pounds and meat from one-half of a typical hog will weigh roughly 60-70 pounds. The empty freezer compartment of a new, average-size, home refrigerator is about 4.8 cu.ft. Therefore, if you only get one-eighth of a beef or a half hog, you should be able to fit it in a mostly-empty home freezer. You may want to shop for a small stand-alone freezer to allow for more storage space and keep the meat colder for long-term storage. Stand-alone freezers can maintain temperatures between -5 and -10°F, whereas the temperature of a refrigerator freezer is usually kept near 0°F.

Some meat processors will store meat for you in their walk-in freezers for a monthly fee of $5 to $10.

The farmer or rancher and butcher who you contract with can help answer these questions and guide your purchase.
How Much Do I Get?

This depends a lot on the animal you buy and the types of cuts you get, as discussed in detail on pages 17-32 of this guide. Below are general figures based on typical cuts from a half beef and a half hog.

Meat from a typical half beef (from a 1,000 - 1,200 lb. live animal) consists of approximately:

- 14 T-bone steaks (3/4" thick)
- 8 sirloin steaks (3/4")
- 2 sirloin tip roasts (3 lbs.)
- 4 arm roasts (3 lbs.)
- 8 packages of stew beef (1 lb.)
- 2 sirloin tip roasts (3 lbs.)
- 6 chuck roasts (4 lbs.)
- 2 rump roasts (3 lbs.)
- 4 packages of short ribs (1.5 lbs.)
- 4 packages of soup bones (1.5 lbs.)
- 80-100 lbs. ground beef

(Variety meats, if desired, such as heart, liver, tongue, and oxtail)

Meat from a typical half hog (from a 250 - 270 lb. live animal) consists of approximately:

- 12-14 lbs. pork chops
- 6-10 lbs. ground pork and/or ground sausage
- 2 packages of spare ribs (1.5 lbs.)
- 1 ham (15-18 lbs.; can be cut smaller)
- 3 shoulder roasts (4 lbs.)
- 8-10 lbs. bacon
- 2 smoked hocks (0.75 lbs.)

(Variety meats, if desired, such as heart, liver, tongue, and fat/lard)

Livestock and Meat Marketing Terms

Now that you have decided to buy an animal directly, what kind of animal are you going to buy? There are many ways animals can be raised and each can affect the characteristics of the meat. Conventional production methods and those described below are all safe, wholesome, and nutritious. Which one you choose is a matter of personal preference. Buying directly from farmers gives you a great opportunity to know exactly how they raise their animals. You might even go visit their farms.

Animal breed also plays a large role in meat characteristics. There are many breeds of hogs and cattle, and many animals are crosses of several breeds. Therefore we cannot attempt to explain any breeds in detail here. If you are curious, just ask the farmer or rancher about the breed(s) of his/her livestock and how it affects their meat. Farmers often spend years breeding for the particular genetics that allow animals to grow well and produce good meat on their farms and under their particular management practices.

Here are some common marketing terms you’ll hear about the way livestock are raised:

- **Certified Organic**—Livestock must be raised on a “certified organic” farm or ranch according to United States Department of Agriculture (USDA) standards. Farmers certify their land by working with an accredited certifying agency, such as the Iowa Department of Agriculture and Land Stewardship. Organic livestock must be organic from gestation, fed only certified organic feeds and processed organically by the butcher (a separate certification process undertaken by the processor).

- **Naturally Raised**—According to the USDA, this means livestock are raised without growth promotants or antibiotics, and never fed animal by-products. **NOTE:** This claim is different from the USDA Food Safety and Inspection Service (USDA FSIS) term “natural,” which means that a meat product does not contain artificial flavors, colorings, chemical preservatives or other synthetic ingredients, and is minimally processed.

- **No Antibiotics**—This means the livestock never received antibiotics.

- **No Hormones**—This means the livestock never received growth hormones. **NOTE:** Federal law prohibits giving hogs growth hormones.
The following terms apply to cattle, not hogs:

- **Grass-Fed**—According to the United States Department of Agriculture, this means that the cattle ate only grass and forages (leafy plants), never grain or grain by-products, and had continuous access to pasture during the growing season. Grass-fed cattle may or may not be organic.

- **Corn-Fed**—Most cattle are fed grain—usually corn—towards the end of production to increase their size and marble their meat. Corn-fed cattle may or may not be organic.

The following term applies to hogs, not cattle:

- **Pastured or “Pasture Raised”**—While not an official term, this typically means that the hogs were raised spending most of their time outdoors on pasture. There are many variations of this claim. Ask the farmer specifically what he/she does.

The following terms apply to meat, not livestock:

- **Halal**—These meats come from animals that have been slaughtered and processed according to Islamic law and certified by an Islamic authority.

- **Kosher**—These meats come from animals that have been slaughtered and processed according to Jewish law and certified by a Jewish authority.

- **Natural**—A product containing no artificial ingredient or added color and which is only minimally processed (a process which does not fundamentally alter the raw product). Different from “naturally raised” (see previous page).

---

Storage and Shelf Life Recommendations

**Space Requirements**

As a general guide, 50 pounds of meat will fit in about 2.25 cu.ft. of cooler/freezer space. The empty freezer compartment of an average-sized home refrigerator will usually hold one-eighth of a beef (roughly 50-60 lbs.) or half a hog (roughly 60-70 lbs.). Quantities larger than this will require a stand-alone freezer or another refrigerator-freezer. A stand-alone freezer will usually store meat better because it has the capability to store meat at a colder temperature. Some meat processors will store product for you in their walk-in freezers for a monthly fee of $5 to $10. This is a good option if you would like to try purchasing half a beef or a whole hog but do not have the freezer space.

**How to Store**

It is recommended that custom-processed beef and pork be frozen before pickup. If you ask, your butcher may keep a portion of it fresh. If kept frozen continuously, meat technically will be safe indefinitely; however, for best quality use it within 9 to 12 months for beef, and within 6 months for pork. It’s a good idea to make sure there is a date on each package so you can keep track of when it was purchased.

**Fresh Meats**

If you request fresh meat, take it home immediately and refrigerate it below 40°F. Use it within three to five days (one or two days for ground meat and variety meats such as liver, kidneys, tripe, sweetbreads, or tongue) or freeze (0°F). It is safe to freeze fresh meat in the freezer paper or vacuum packaging it comes in from the processor. It is not recommended that you try to freeze a large quantity of fresh meat in your home freezer. It will freeze slowly, which is bad for the quality.
Packaging

With the exception of fully-cooked sausages, which are often vacuum packaged, most meat will come wrapped in white butcher freezer paper. If you plan to store something frozen for a long time (longer than six months), you might consider asking the butcher to double wrap it in freezer paper, or vacuum package it. There will be an extra fee per pound for this, but it will minimize the chance of freezer burn. Check packages for leaks before placing them in the freezer, then check periodically thereafter to see that packaging is intact. Consider the portions you want in your packages, so you can thaw the proper portion when you need it. How many steaks do you want per package? How much ground meat per package? What size roasts do you want?

Safe Meat Handling and Cooking

Defrosting Frozen Meats

There are three safe ways to defrost meat: in the refrigerator, in cold water, and in the microwave. The United States Department of Agriculture (USDA) does not recommend defrosting meat on the counter or in other locations.

- **Refrigerator**—It is best to plan ahead for slow, safe thawing in the refrigerator. Small packages (1 lb.) of ground beef or pork, stew meat, and steaks/chops may defrost within a day. Bone-in cuts and whole roasts may take two days or longer. Once the meat defrosts, it will be safe in the refrigerator for three to five days before cooking; one to two days for ground meat.

- **Cold Water**—To defrost meat in cold water, do not remove packaging. Be sure the package is waterproof or put it into a leak-proof bag. Submerge meat in cold water, changing the water every 30 minutes so that it continues to thaw. Small packages may defrost in an hour or less; a three- to four-pound roast may take two to three hours.

- **Microwave**—When using a microwave to defrost meat, plan to cook it immediately after thawing because some areas of the food may become warm and begin to cook during microwaving.

Foods defrosted in the microwave or by the cold water method should be cooked before refreezing because they may have been held at temperatures above 40°F.

It is safe to cook frozen meat in the oven or on the stove or grill without defrosting it first; the cooking time may be about 50 percent longer. It is not recommended to cook frozen meat in a slow cooker because the center may not fully cook.
### Raw Meat Handling

The cutting boards, plates, knives, and other utensils used to prepare raw meat should be washed with soap and hot water, both before and immediately after using them. Be sure to wash your own hands before and after handling raw meat as well. Raw meat may contain harmful microorganisms.

#### Liquid in Package

The red liquid in packaged meat is not blood (that is removed from the meat during slaughter and only a small amount remains in the muscle tissue). The meat’s natural moisture, combined with muscle pigment, is the source of the liquid.

#### Freezer Burn

Freezer burn appears as grayish-brown leathery spots on meat and is caused by air reaching the surface. Freezer burn does not make food unsafe, merely dry in spots. Cut away freezer-burned portions before cooking the food.

### Marinating

Marinate meat in the refrigerator up to 24 hours. Boil used marinade before brushing on cooked meats. Discard any uncooked leftover marinade.

### Safe Cooking of Beef

For safety, the USDA recommends cooking hamburgers and ground beef mixtures such as meat loaf to an internal temperature of 160°F. Use a meat thermometer to confirm the internal temperature. Whole muscle meats such as steaks and roasts may be cooked to 145°F (medium rare), 160°F (medium), or 170°F (well done). It is recommended that whole muscle cuts that have been injected (moisture-enhanced) or mechanically tenderized be cooked to medium or well done.

### Safe Cooking of Pork

For safety, the USDA recommends cooking ground pork patties and ground pork mixtures such as meat loaf to 160°F. Whole muscle meats such as chops and roasts should also be cooked to 160°F. Cooked muscle meats can be slightly pink even when the meat has reached a safe internal temperature.

*Remember that appliances and outdoor grills can vary in heat. Use a meat thermometer to monitor doneness.*

Refrigerate leftovers as soon as possible.

### Questions?

The United States Department of Agriculture operates a Meat and Poultry Hotline staffed by live food safety experts who can answer questions about safely preparing meat and poultry. The Hotline operates weekdays only, 10 a.m. to 4 p.m., eastern time. Operators speak English and Spanish.

Phone 1-888-MPHotline (888-674-6854) or send an e-mail to mphotline.fsis@usda.gov.
**Beef Aging**

*NOTE: Pork does not benefit from aging longer than one to two days.*

Aging, measured in days, refers to the time from when the animal is slaughtered to when the beef carcass is broken down into retail cuts. Beef purchased directly from farmers or ranchers and processed by a local butcher will typically be “dry aged,” meaning the carcass will hang in a walk-in cooler while aging. “Wet aging” is a process used to age wholesale beef cuts in vacuum packaging and not often used by smaller-scale meat processors.

Dry aging beef does three things:

1. Improves meat tenderness
2. Increases “beefy” flavor
3. Causes meat to lose weight through evaporation

For most people, aging beef 7 to 10 days will result in adequate tenderness, desirable flavor and modest meat weight loss. Typically local butchers will age a beef carcass 7 to 10 days, unless asked to do otherwise. Carcasses with little or no fat cover—such as some grass-fed animals—should not be aged beyond seven days. Aging beef beyond 11 days primarily results in stronger flavor and increased product weight loss, with just a minimal increase in tenderness. Additionally, beef that is “hanging” takes up the butcher’s limited cooler space, so you can expect to pay a fee for additional aging. The desirability of the increased beefy flavor that develops through extended aging is purely personal preference. Aging beyond 28 days may result in off flavors. Confirm with your butcher how long your beef carcass will be aged.

As a general rule, younger animals will be more tender than older animals and fatter animals will be more tender than leaner animals.

---

**Understanding Meat Inspection**

All meat sold at a store, farmers’ market, or restaurant in the United States must have been inspected and passed by the United States Department of Agriculture Food Safety Inspection Service (USDA FSIS), or one of 27 state meat inspection programs. The label on the package will have either a federal or state mark of inspection:

- **USDA inspection mark**
- **State of Iowa inspection mark**

Each mark of inspection has a number that identifies the facility where the meat was processed. This is used for traceability. If you buy part or all of a live animal from a local farmer or rancher, depending on availability and where you live, you can choose to have the animal slaughtered and processed at a USDA-inspected facility, a state-inspected facility, or a “custom-exempt” facility. In a custom-exempt facility, the operations are inspected regularly by food safety authorities, but as opposed to a USDA or official state-inspected facility, each individual animal is not inspected for wholesomeness. Livestock slaughtered and processed under custom-exemption will be labeled “NOT FOR SALE” and is exclusively for use by the owner, members of the owner’s household, and the owner’s employees or non-paying guests.

*NOTE: State-inspected meat cannot be sold across state lines. For example, meat inspected and passed by the Iowa Department of Agriculture and Land Stewardship cannot be sold in Minnesota or any state other than Iowa. Once sold, meat can be transported across state lines if it will not be resold.*
Making Sense of Weighty Issues

Live Weight vs. Carcass Weight vs. Finished Cut Weight

Adapted from "Did the Locker Plant Steal Some of My Meat?" by Duane M. Wolf, Ph.D., Department of Animal and Range Sciences, South Dakota State University. Used with permission.

Turning a live animal into meat means removing a lot of the parts that aren't edible, like the hide, feet, head, bones, and most of the innards. This happens in two steps:

1. When the animal is slaughtered, weight is lost from the animal's live weight. What remains is called the "carcass weight" (sometimes also called "hanging weight"). The percentage of live weight that remains as carcass weight is called "dressing percentage."

2. When the carcass is made into finished cuts, weight is lost from the carcass weight. What remains is called the "finished cut weight." The percentage of carcass weight that remains as usable meat is called "carcass cutting yield."

To determine how much meat you should expect to take home from an animal, use the following calculation:

\[
\text{Live Weight} \times \text{Dressing Percentage} \times \text{Carcass Cutting Yield} = \text{Pounds of Meat}
\]

Average Dressing Percentages:
- 61% Beef cattle
- 59% Dairy steers
- 72% Hogs

Dressing percentage is affected by:

1. **Gut fill**: The more stomach fill at the time the live weight is determined, the lower the dressing percentage will be.

2. **Muscling**: A heavier muscled animal will have a higher dressing percentage than a light muscled animal.

3. **Fatness**: A fatter animal will have a higher dressing percentage than a lean animal.

4. **Mud**: Cattle with a lot of mud on their hides will have a lower dressing percentage than clean cattle.

Carcass cutting yield is affected by:

1. **Fatness**: Leaner animals will have higher carcass cutting yields than fatter animals.

2. **Muscling**: More muscular animals will have higher carcass cutting yields than less muscular animals.

3. **Bone-in vs. boneless**: This will dramatically affect carcass cutting yield. If more boneless cuts are made, the carcass cutting yield will be lower. If bone-in chuck roasts, rib steaks, T-bones, and bone-in sirloin steaks are made, the carcass cutting yield will be much higher than if boneless chuck roasts, ribeye steaks, strip steaks, and boneless sirloin steaks are made. It is important to note that the amount of edible meat will not change. (Boneless cuts will take up less room in your freezer.) If you get soup bones and short ribs, the carcass cutting yield will be higher than if you have these items boned and put into ground beef.

4. **The amount of fat remaining on the meat cuts**: If the meat cutter leaves more surface fat on the meat cuts, then the carcass cutting yield will be higher than if the meat cuts are closely-trimmed.
5. **The leanness of the ground product:** If the ground product (ground beef, ground pork, pork sausage) is made very lean, then the carcass cutting yield will be lower than if the ground product is made with more fat. For example, a typical beef carcass could have 20 more pounds of ground beef if it is made into 70% lean ground beef than if it is made into 93% lean ground beef.

**BEEF EXAMPLES:**

Live Weight X (Dressing Percentage X Carcass Cutting Yield) = Pounds of Meat

Average live beef animal, weighing 1,200 pounds, cut into boneless steaks and roasts, closely trimmed, lean ground beef:

\[ 1200 \times (0.61 \times 0.62) = 1200 \times 38\% = 456 \text{ lbs. of meat} \]

Average live beef animal, weighing 1,200 pounds, cut into bone-in steaks and roasts, regular trimmed, regular ground beef:

\[ 1200 \times (0.61 \times 0.71) = 1200 \times 43\% = 516 \text{ lbs. of meat} \]

Average live beef animal, weighing 1,200 pounds, cut into some bone-in and some boneless steaks and roasts, closely trimmed, regular ground beef:

\[ 1200 \times (0.61 \times 0.67) = 1200 \times 41\% = 491 \text{ lbs. of meat} \]

**PORK EXAMPLES:**

*Note: The dressing percentages and carcass cutting yields in these examples are for skin-on pork carcasses. Many small-scale meat plants skin pork carcasses. Skinned carcasses will have lower dressing percentages and higher carcass cutting yields. However, you will still come up with the same answer when calculating the amount of meat so these examples still apply. In other words, you will get the same amount of meat from a hog whether the carcass is skinned or not.*

Average live hog, weighing 250 pounds, cut into bone-in chops and roasts, closely trimmed, regular ground pork/sausage:

\[ 250 \times (0.72 \times 0.74) = 250 \times 53\% = 133 \text{ lbs. of meat} \]

Average live hog, weighing 250 pounds, cut into boneless chops and roasts, closely trimmed, lean ground pork/sausage:

\[ 250 \times (0.72 \times 0.65) = 250 \times 47\% = 117 \text{ lbs. of meat} \]
Beef Cuts by Primal

A beef carcass is first divided into eight large sections, known as primals. These are then cut into individual roasts or steaks, depending on customer preference. The following pages explain which cuts are available from each of the following eight primals:

1. Chuck
2. Brisket and Shank
3. Rib
4. Short Plate
5. Flank
6. Short Loin
7. Sirloin
8. Round

NOTE: Other less common beef cuts may be available in addition to those listed on the following pages. Talk with the farmer/processor or butcher about processing and packaging options, such as the number of steaks you want per package.

The beef chuck primal is the animal’s shoulder and accounts for approximately 26 percent of the carcass weight. This section contains a portion of the backbone, five rib bones, and portions of the blade and arm bones. Because an animal constantly uses these shoulder muscles, the chuck contains a high percentage of connective tissue, resulting in less tender but very flavorful meat. Chuck and other working-muscle cuts cook well with moist-heat cooking such as stewing and braising.
The brisket (breast) and foreshank (front leg) form a single primal that accounts for approximately 10 percent of the carcass weight. The boneless brisket is well suited for moist-heat methods of cooking, such as simmering or braising. It may be pickled or corned to produce corned beef brisket, or cured and peppered to make pastrami. Cross-cut foreshank is very flavorful and high in collagen, which converts to gelatin when cooked using moist heat. It makes excellent soup stock.

The beef rib primal accounts for approximately 10 percent of the carcass weight and is best known for yielding prime rib roast, also called rib roast. (NOTE: Prime rib is not named for the quality grade “USDA Prime.”) The ribeye muscle (the center muscle) provides structural support, rather than mobility, and is therefore quite tender. It also contains large amounts of marbling compared to the rest of the carcass and produces rich, full-flavored roasts and steaks. Although roasting the ribeye muscle on the rib bones produces a moister roast, the bones can be removed to produce a boneless ribeye roast. Ribs are meaty, flavorful bones separated from the ribeye meat and are often served as barbecued beef ribs. Rib meat may also be ground.
The short plate and flank, located directly beneath the rib and sirloin, account for approximately 10 percent of the overall weight of the carcass. The flank steak is meaty yet high in connective tissue and is best marinated, and grilled or broiled, cooked to medium-rare. Skirt steak is often marinated and grilled for slicing, as for fajitas. Other less meaty portions of the short plate are typically trimmed and ground.

The short loin is the front portion of the beef loin, located just behind the rib. It accounts for approximately 8 percent of the carcass weight and yields many of the most tender and expensive cuts of beef. The short loin also provides a great example of the give and take inherent in cut selection. Steaks from this primal are interrelated: The tenderloin is the most tender cut and is sometimes removed whole or cut separately into tenderloin steaks (filet mignon). However, Porterhouse and T-bone steaks include both a New York strip (on one side of the “T”) and a portion of tenderloin (on the other side). Removing the tenderloin rules out the cutting of T-bone and Porterhouse steaks.
Likewise, if you choose to process as many T-bone steaks as possible, there won’t be meat left for New York strip steaks. Understanding this interrelation is an important step in knowing and using the whole animal. Cut choices from this primal include:

- The tenderloin is the most tender cut of all. It lies beneath the loin eye muscle, under the backbone, and is exceptionally tender because it is exercised very little.

- T-bone steaks are produced when the short loin cut is cut in cross-sections with the bone in. It contains a New York strip on one side of the “T” and a small portion of tenderloin on the other.

- New York strip steaks (a.k.a. boneless top loin steaks) are from the loin eye muscle—a continuation of the rib eye muscle, running along the top of the T-shaped bones that form the backbone.

- Porterhouse steaks are cut like a T-bone from farther back on the short loin, which ensures that it contains a larger portion of tenderloin on one side of the “T” backbone.

The sirloin, located between the short loin and the round, accounts for approximately 9 percent of the carcass weight and contains part of the backbone as well as part of the hipbone. This primal produces flavorful and tender bone-in or boneless roasts and steaks. With the exception of the tenderloin portion, these cuts are not as tender as those from the short loin. Sirloin tip steaks and roasts have several names such as “round tip steak” and roast or just “tip steak” and roast. These are flavorful but less tender cuts. Top sirloin steaks or roasts are traditional, meaty cuts. Sirloin cuts do best with dry-heat cooking methods such as broiling, grilling, or roasting.
The round is very large, accounting for approximately 27 percent of the carcass weight. Meat from the round—the hind leg of the animal—is flavorful and lean. Steaks from the round can be marinated and grilled or braised (like Swiss steak). Round roasts should be cooked with moist heat. Round steak is cut on average 3/4 inch thick. Other cuts from this primal include minute steak (a round steak cut into smaller portions and tenderized) that can be used for chicken-fried steak; dried beef, usually thin-sliced and fully cured; and hindshank, a very flavorful cut that makes excellent soup stock. In the round, you cannot get full cut round steaks and top, eye, and bottom round steaks. They are from the same muscles.

Ground
The “trim,” or meat and fat trimmed from the individual cuts listed on the previous pages, is blended into ground beef. The resulting composite usually ranges from 70 percent lean to more than 90 percent lean. Leaner beef will taste drier and overcook more easily. Less lean beef will contain more fat. Most people prefer 80 or 85 percent lean for burgers and meatloaf. The leaner you order your ground beef the less you will get, because there is less fat in it. Some processors can make various processed products out of beef trim, such as frankfurters, bologna, and snack sticks. Be sure to ask.

Variety Meats
Variety meats include the heart, kidney, tongue, tripe (stomach lining) and oxtail. Many of these are considered delicacies when properly prepared. No idea what to do with them? Non-organ variety meat is generally best prepared with moist heat and is often used in soup, stew, or braised dishes. Organs, such as heart and liver, are good sliced and fried. Celebrated British chef Fergus Henderson has written an entire cookbook dedicated to these tasty bits, *The Whole Beast: Nose to Tail Eating.*
Pork Cuts by Primal

A pork carcass is first divided into four large sections, known as primals. These are then cut into individual cuts and roasts, depending on customer preference. The following pages explain which cuts are available from the following four primals.

1. Shoulder
2. Loin
3. Side (a.k.a. Belly)
4. Leg (a.k.a. Ham)

NOTE: Other less common pork cuts may be available in addition to those listed on the following pages. Talk with the farmer/rancher or butcher about processing and packaging options, such as the number of chops you want per package.

Pork shoulder accounts for about 25 percent of the carcass weight and is typically subdivided into two sections: the top portion known as the Boston butt, and the bottom portion known as the picnic. These sections contain significant connective tissue (because the animal uses its shoulders extensively) but are flavorful. The shoulder blade steak is a flavorful bone-in, marbled steak that is good for marinating, grilling, or braising. The Boston butt roast or shoulder roast is a well-marbled roast from the top of the shoulder, and is available boneless or bone-in. Picnic arm roast or shoulder roast is a rich roast that cooks well with moist cooking methods and is available boneless or bone-in. Cottage bacon is shorter, runder, meatier pieces that are cured or smoked like bacon from the belly. The foreshank/hock is often simmered in soups, stews, and braised dishes to add flavor and richness.
The loin primal, accounting for about 22 percent of the carcass weight, contains the rib, the loin, and the sirloin section. The whole loin can be cut boneless or bone-in. Pork chops that are cut 1 1/2” thick are often called Iowa chops; regular pork chops can be cut bone-in or boneless. The tenderloin is the most tender cut and can be whole or sliced as medallions. Baby back ribs are trimmed from the blade and center sections of the loin when making boneless chops or deboning the whole loin. These are good cooked dry and rubbed with herbs/spices or cooked wet in sauce. Country-style ribs, meatier than baby back or spare ribs, are cut from the rib end of the loin and are best slow-cooked or barbecued. The crown roast is a showy entree created when the pork rib roast/rack of pork is tied into a circle with the ribs exposed and pointing up. Paper caps often adorn the rib tips when the roast is presented.

Containing both the spare rib and the belly, the side makes up about 23 percent of the carcass. The meat is streaked with fat and is typically cured and smoked to produce bacon. Fresh, uncured pork belly can be braised or roasted. A whole pork belly is usually 12 to 14 lbs. Spare ribs are trimmed from the inside of the belly and are best baked or barbecued. “Pancetta” is belly meat that has been cured in brine and rubbed with herbs but not smoked.
Bone-in ham, fresh

Boneless ham, fresh

**Leg or Ham**

The hind leg accounts for approximately 30 percent of the carcass weight and contains large muscles with relatively little connective tissue. Hams are often cured and smoked, but fresh hams also produce tasty, meaty roasts. Half or whole fresh ham roasts are uncured and can be either boneless or bone-in. Sometimes the skin may be left on. Half or whole cured ham is the traditional cured, smoked "ham," either boneless or bone-in, and typically fully cooked. Ham hocks are often simmered in soups, stews, and braised dishes to add flavor and richness.

**GROUND**

Trimmed meat and fat, originating mainly in the shoulder and leg, may be ground for “fresh ground pork” or seasoned for sausage. Many processors require a minimum quantity of ground trim for each batch of sausage—often at least 10 pounds. Ask to try samples of your butcher’s signature sausages, often including breakfast sausage, Italian sausage, and bratwurst.

**LARD**

Prized for baking, lard is a key ingredient in prize-winning pie crusts every year at the Iowa State Fair. Some butchers will be able to prepare lard from your hog. To render your own at home, place ground or diced fat into a baking pan in the oven at 200˚F for about six to eight hours. Periodically pour off the lard into a storage container as it renders out, cooling it in the refrigerator. Homemade lard should be stored under refrigeration. Lard freezes well for long-term storage.

**Variety Meats**

Pork liver, tongue, spleen, feet / knuckles, neck bones, jowls, and tail are typically available upon request. Many of these are considered delicacies when properly prepared. No idea what to do with them? Non-organ variety meat is generally best prepared with moist-heat and is often used in soup, stew, or braised dishes. Organs, such as heart and liver, are good sliced and fried. Celebrated British chef Fergus Henderson has written an entire cookbook dedicated to these tasty bits, The Whole Beast: Nose to Tail Eating.
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(9) Conclusions & Future Directions

We are still a long way from realizing a widespread and vibrant civic agriculture, but in this dissertation, I have illustrated with a real case how using a community of practice (CoP) can strongly support rural development and civic agriculture by holistically managing knowledge, and fostering communicative rationality in real on-the-ground terms. In doing so, CoPs can significantly reduce disconnections – caused by bureaucracy or otherwise – that facilitate the negative effects of industrial agriculture because such disconnections allow negative effects to be more easily externalized. The grounded communication flows among equally empowered and receptive individuals can help solve complex real-world problems through the sharing of knowledge holistically. As discussed in Chapter 3, communities of practice have convergent functionality; they are both a means and an end. As Mooney (2004:92) puts it, “the means and the ends of cooperation are understood as fused” and thus cannot be inverted.

Our multi-agency working group has produced many insights and cross-fertilizations, particularly when members stepped out of their bureaucratic shoes. The *Iowa Meat Processors’ Resource Guidebook* works well because it facilitates access to and the sharing of knowledge amongst meat processors, flexible local institutions, and codified bureaucracies.

Looking ahead there is still much to do for the Small Meat Processors Working Group (SMPWG); small meat processors in Iowa are far from “saved.” In fact, the notion of “saving” small meat processors has, in itself, been one of the biggest challenges the group has faced. After the publication of the *Iowa Meat Processors’ Resource Guide*, the group began to be more expert-led in process. We, myself included, thought we had the right ideas to take the lead on move forwarding. Yet, while expert knowledge certainly has its place, a orientation towards leadership by experts has been problematic for two closely related reasons: 1) it hampers needs assessment because experts only have an abstract sense of need (we don’t actually operate the meat lockers), and 2) processors have proven hesitant to buy into the
needs that we, the experts, have decided that they have. For example, the “expert-led” workshops the SMPWG helped hold on plant optimization and cost accounting work were not as successful as we had hoped. With cost accounting, we used formulaic programs that had been developed for other industries; the spreadsheets were not targeted enough to the specific questions that meat processors asked. The trainings did not provide enough hands-on instruction on how to use of the spreadsheets. As a result, one-third of attendees never looked at the spreadsheets again after the trainings. In short, the whole process was too abstract. The basis for the SMPWG formation was well designed, as discussed earlier, in that it specifically worked on the grounded problems of the three processor test cases, and thus, to a great extent, avoided “expert” analysis regarding what the problems were.

Needs assessment in all the VCP groups has been conducted chiefly through focusing on the specific grounded needs of business owners-operators, as opposed to “expert” opinion, because by-and-large we’ve found “expert” opinion to be at best incomplete and at worst unreliable. The Pork Niche Market Working Group (PNMWG) conducted it’s original meeting using a “fish bowl” technique where pork producers were put in the center of the room and asked to talk among themselves about challenges they saw regarding niche pork production. Assistance providers were seated around the outside and told simply to listen. The group’s coordinator, based on previous experience, was concerned that if the meeting were not structured in this way, the “experts” would dominate the conversation and the farmers would defer to them because they are the “experts.” The PNMWG coordinator said that many “experts” told him afterwards that the process had been very eye-opening for them.

In the SMPWG, we are now trying to develop a structure where small meat processors identify challenges or successes that they have and hold meetings, as open houses, with other processors to discuss and learn. Assistance providers are there to provide some facilitation and feedback, particularly regarding methods that might be used to help solve problems. The rationale for this approach is that we “experts” very well may not know the right answer,
which likely involves both tacit and contextual knowledge. However, we may have some ideas about how to determine the answer, working in partnership with the processors. Similarly, the Regional Food System Working Group meetings are increasingly being structured by the county sub-groups, and “open space” sessions are being arranged so that people have more elective options to discuss and work on issues they see as most pressing.

So far, the SMPWG proposal to hold regional, in-plant meetings focusing on specific challenges and successes in context has been well received by the Iowa Meat Processors Association (IMPA). They have agreed to co-host four meetings spread regionally around Iowa in March, April, and May of 2010 – with an invitation to such meetings coming from the hosting processors, IMPA, and the SMPWG. Two members of the IMPA Board have agreed to host meetings in their plants, regarding challenges they have identified. One will focus on improving productivity, working in-plant with CIRAS before the meeting to test ideas to bring to the open house discussion. The other is undergoing a significant renovation and would like to talk through process with other processors to get feedback and alternative ideas. Both processors are enthusiastic about getting the perspectives of other processors. One stated, “I joined the Iowa Meat Processors Association because I wanted to learn from others in this industry. This will help.”

Doing more in-plant, hands-on work will help keep us away from too much abstraction. Groups organized and/or facilitated by organizational staff can easily drift off course by “expert” opinion and typically need to continually be kept in touch with reality by directly working with business and people who are doing work on the ground. And the SMPWG found out that directly working with individual business was much more successful than survey results (which are in themselves an abstraction).

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17 “Open space” sessions are unstructured to semi-structured forums where people propose topics for group discussion. Participants are free to come and go as they please and ask questions or share insights as they see fit. Open space sessions always arranged as multiple concurrent sessions, sometimes in multiple rounds, so there are options.
Similarly, the Regional Food System Working Group (RFSWG) shifted to focus on county-based groups after a couple of years working with various types of regional food businesses, which proved too disjointed to maintain consistent membership engagement. The tentative conclusion is that grounded problems are necessary to understand the tacit aspects that are necessary for the production of real solutions. The very real connections made among people to solve specific problems are necessary to keep them engaged, and to prevent a devolution into unproductive abstraction.

The voluntary nature of a CoP facilitates assuring that all CoP members provide at least some feedback about, and buy into, the group’s projects: all organizations must come to consensus about the goals and process in order for it to be successful. If any group does not agree, it can voice concerns, refuse to act, or leave the CoP at any time. This structure provides for good, rapid feedback to the larger group that some aspect of a project may need modification or reexamination. No member leaves without a reason (not to say that groups will not have turnover; the SMPWG has). And successful management is facilitated by good feedback in order to make effective adaptations. Any bureaucratic organization will be challenged in this area by the bureaucratic chain of command which inherently compromises feedback from people lower on the chain to those higher up.

Time will tell how these directions will play out. The Leopold Center has agreed to support this work, in part, through 2010. In addition to facilitating better knowledge management, in-plant processor-led workshops will be very cost-effective to carry out, because most time will be donated. The processors who do the work will also reap benefits so they will not need financial compensation, and no large research projects by university or agency personnel will be required. Everybody just shows up and contributes accordingly. The organization for this process will likely be iterative and contextual in design, and we will likely learn much about how not to do things. But we will learn together.

While the work of the SMPWG has certainly not been perfect, the group has been
rather successful and significantly impacted how small meat processors receive technical assistance in Iowa. As Wenger, McDermott, and Synder (2002) discuss in detail, there is great flexibility within the CoP form. Based on this work, I conclude that using CoPs is a very promising methodology, extremely worthy of further experimentation and study by others to promote rural development and civic agriculture.
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Evaluation of the
Small Meat Processors Working Group

October, 2009
Corry Bregendahl
Leopold Center for Sustainable Agriculture

PURPOSE OF THE EVALUATION

The Small Meat Processors Working Group is one of four working groups, or Communities of Practice, supported by the Value Chain Partnerships project (VCP). VCP is an Iowa-based network for food and agriculture working groups funded by the Wallace Center for Sustainable Agriculture at Winrock International and by the Leopold Center for Sustainable Agriculture. The Value Chain Partnership project supports new supply networks for farmer-led food, fiber, and energy enterprises that follow sustainable practices.

The Small Meat Processors Working Group received $20,000 from VCP in 2008. As part of its formal involvement in VCP, the Small Meat Processors Working Group is part of the overall work of the Value Chain Partnerships project. Evaluation of VCP and each of the four working groups has been ongoing, and is important for tracking the impact of each group. However, evaluation of VCP is also meant to carve out time or cause pause for reflection and serve as a decision making tool for the groups. Indeed, people often focus their time and attention on activities but take little, if any, time to reflect on what they have accomplished or lessons they have learned in the process of their work, and how they might use these lessons to work more effectively in the future. This evaluation is therefore intended to increase opportunities for participants of the Small Meat Processors Working Group to celebrate the group's accomplishments, articulate what the group has learned, and use this information to think more strategically about where the group will move into future as it moves its collective foot forward.

BACKGROUND

The Working Group was formed in 2006 by Arion Thiboumery, a graduate student in Rural Sociology and Sustainable Agriculture at Iowa State University, who was struck by the dwindling number of small meat processors in Iowa. As part of his research, he found there were 550 small meat processors in 1965 compared with less than 200 in existence today. With further investigation, he learned that the reason for the decline was not for lack of business, but rather structural issues that were interfering in their ability to survive. Indeed, lockers often have more business than they can handle. Small meat locker owners are often so busy managing their businesses that they often don't have or take the time to document what is happening within the business. Even though locker owners are intimately familiar with the daily operations and decision making, they might not know where they are profitable or even if they are profitable.
When existing owners try to sell, new owners have no documentation to take to the bank to demonstrate whether these operations are viable businesses. Many therefore go under when existing owners get out of the business because there is no paper trail left behind to facilitate transition to a new owner.

On the other hand, if small meat lockers want to grow and expand rather than sell, in principle they can contact organizations and usually state regulatory agencies for technical assistance. However, this is when they learn the hard lesson that each agency is so specialized that even if personnel they contact are indeed the right people to help them out, the issues are generally too complex to be handled by any one agency. As a result, the locker owner (already strapped for time) is left out of the loop since few, if any, of these assistance providers communicate, much less know what the other one can do for small meat lockers. The onus therefore falls on the locker owner to connect all the bureaucratic dots. When this roadblock proves too formidable, they find themselves in stasis because locker owners can't sell (and have the business survive) and they can't grow (and have the business survive). Until the formation of the Small Meat Processors Working Group, there were simply no forums where assistance providers could jointly understand, let alone address, the bevy of processing, marketing, financing, food safety, labor, accounting, tax, regulatory and other small business development issues facing this sector. The Small Meat Processors Working Group was formed to address these challenges. Today, active organizational, institutional, and agency representatives in the Working Group hail from:

- the **Center for Industrial Research and Service (CIRAS)**, the Cooperative Extension arm of the ISU College of Engineering to support small manufacturing firms across the state;
- **ISU Meat Science Extension**, which works with meat processors to keep them informed on food processing and food safety technologies and techniques;
- the **Iowa Meat Processors Association (IMPA)**, the Iowa affiliate of the American Meat Processor's Association comprised of meat and poultry businesses;
- the **Bureau of Meat and Poultry Inspection** at the Iowa Department of Agriculture & Land Stewardship (IDALS), the regulatory agency responsible for meat processing;
- **ISU's Value-Added Agriculture Program** (part of ISU Extension to Agriculture and Natural Resources), which provides information and technical assistance to help establish or expand agricultural-related enterprise in Iowa;
- the **Iowa Farm Bureau Federation**, a voluntary membership and advocacy organization for farmers and non-farm members;
- the **Drake University Agricultural Law Center**, dedicated to creating opportunities for students to study how the legal system shapes the food system and influences the ability of the agricultural sector to produce, market and use agricultural products; and
- the **Leopold Center for Sustainable Agriculture** whose mission is to research the negative impacts of agricultural practices, assist in developing alternative practices, and work with ISU Extension to disseminate this information.

Two participants of the working group are also small meat locker owners. Although initial meetings of the Group were face-to-face, meetings have shifted to facilitated bimonthly conference calls to reduce travel time. However, associated face-to-face meetings (usually
project-based) between several participants of the group still take place as they work together to plan and implement projects, proposals, and workshops.

**METHODOLOGY**

In late November and early December, 2008, Corry Bregendahl, Assistant Scientist at the North Central Regional Center for Rural Development, interviewed by telephone active participants of the Small Meat Processors Working Group. These were defined as people participating regularly in the bimonthly conference calls. Together, Corry and Arion developed questions for the interview, which were designed to elicit information about impact the group was having on participating individuals and organizations, new collaborations and partnerships, changes in organizational customs and practices, as well as group sustainability issues to consider as leadership changes loom in the future. The interview questions were sent to participants via e-mail to elicit feedback on question content, and to notify them of an upcoming call from Corry to conduct the interview. Ten participants were contacted and all ten responded, for a 100% response rate. The length of the interviews ranged from 15 to 45 minutes.

**RESULTS AND DISCUSSION**

People tend to learn quite easily from mistakes. However, people are typically unaccustomed to learning from what they and others do well. Having a conversation about what we do well can help groups identify elements that contribute to their success which helps them preserve those elements to serve them well in the future. However, it also opens the conversation up to what could be done better in the future. This inquisitive philosophy is the basis for the following discussion about successes and benefits the Small Meat Processors Working Group has brought the group and what participants recognize as success in order to help the group continue doing good and important work.

**Working Group Successes**

We initiated the conversation about what's working well in the group by asking participants to name one event or accomplishment they felt successful or good about in terms of their participation in the working group. We then asked them to identify what it was about that experience that made it so successful to deconstruct the elements that are working well. Several participants mentioned more than one success. Listed below are five successes participants named and reasons why each was successful.

**Success #1: Publication of the Meat Processor's Resource Guidebook (80% of respondents)**

*Why It Is Successful*

- The Guidebook is relevant and useful to processors and service providers in the small meat processing industry. "Everyone I've directed to the materials has said it's exactly what they needed. It's been used by processors and CIRAS project managers so [they] can tie in product costing and process flow."
• The Guidebook is helping partner organizations better serve small meat processors. "[CIRAS has] two to three project managers that have copies [of the Guidebook] who were starting to bring them in to help with process flow, efficiency, throughput."

• The Guidebook prompted new work. "There have been so many avenues that [we have pursued because of the Guidebook] such as tax issues we are addressing with the state, the costing analysis, network sharing, and the small niche business development."

• It provided a reason for different groups to work together. "It tied the whole Group together..."

• It was a new, single, comprehensive source of information for the industry. "[It's] a resource for the meat processors that compiled [information] in one source and it helped meat processors identify resources they weren't aware of."

• The Group participants discovered they could achieve new things together which provided new motivation and opportunities for continuing to work together. "Completion of the [Guidebook] was pivotal for the group in showing that the collaboration would accomplish something visible and usable. [In the start], the goal was the publication and there was no other goal. That publication made it clear to the group that they wanted to go beyond the Guidebook."

Success #2. Collaboration of the group (30% of respondents)

Why It Is Successful

• Partner success is Working Group success. "Working with the small meat lockers or any company allows us to be successful when we see them maintain employment and add to employment."

• Participants can report Working Group successes to their respective organizations and agencies to marshal more support for the work. "Instead of having it be a once-in-a-while topic that I get asked about, it's probably more than 50% of my time and it was 5% before."

• It prompts new ways of doing things. "It's been a huge contribution to some radical changes [within my organization]."

• It prompts new collaborations. "We now partner with Meat Science Extension that is leading us to jointly explore future programs together."

Success #3: Work on publications, such as the Boilerplate for Meat Processing Plants and the Meat Buyer's Guide (20% of respondents)

Why It Is Successful

• They provide another reason to collaborate while providing yet another tool to help service/technical assistance providers in the group facilitate information flow and relationships between meat processors, producers, and the public.

• Publication completion is not considered possible without collaboration. "On our own, [my organization] would never have developed the [Boilerplate for Meat Processing Plants] or the resource guidebook."

Success #4. The Group's sponsorship of the costing analysis workshops (20% of respondents)

Success #5. Organization of the succession planning workshop at the 2009 Iowa Meat Processors Association meeting (10% of respondents)
Why It Is Successful

- The workshops provide a tangible and rewarding way for Working Group partners to work together to better serve the industry.

Benefits and Impacts of Participation

Understanding the individual and organizational benefits of participating in the group can be a resource for planning group strategies and activities to retain existing participants, as well as appealing to new groups to get involved. Benefits and impacts are presented together, since respondents invariably connected benefits with impacts those benefits had on their business or organization. Participation in the SMPWG offers the following benefits and impacts, sorted by group:

Benefits and Impacts on Small Meat Processors

Benefits the working group provides small meat processors can be described as a chain reaction. The working group helps build business-related knowledge and skills by linking small meat processors with information and people, both of which provide them with resources to make better decisions about their business. This, in turn, results in greater business profitability, greater access to new resources, and ultimately business sustainability.

- The working group is providing education and training opportunities for small meat processors resulting in better business management decisions. "The costing workshop showed me where the costs were and where we needed to bump up the pricing. I went through it with all my deer products and raised prices around 15%.”
- The group is helping small meat processors improve the profitability of their business. "It made our profit margin a lot better. We price products differently and get a better return on products now." "We did one survey round of those participating in the costing workshop. We found a lot of small meat lockers are owner operated and don't have enough time to implement what they are learning from the workshops but one couple embraced this and the impact was up in the hundreds of dollars.”
- Workshops supported by the working group and organization partners are prompting meat processors to update record keeping systems. "I would say we are keeping better records now—we're getting to the point of possibly barcoding. When I [took over the business], I had black crayon and butcher paper with the inventory on it.”
- Relationships developed through the working group are helping small meat processors find labor. "[The working group] helped us find labor— at one point in time, we had the Latinos in Action group based in Marshalltown to try to assist with job placement. We hired [through them] two to three different times. Sometimes it worked and sometimes it didn’t.”
- Small meat processors report that the group is connecting them with human and knowledge resources to help them make better business decisions. "Everyone [in the group] seems to have an interest and a desire to help and assist... I don't know how else I would have found out this information and that there were people at the local university that could help out. Now I know I have tools. This has all stemmed from bringing all these people together. It provides personal benefit and industry benefit.”
- One processor associated the above benefits with improving his ability to secure credit for his business, presumably because the group helps him be a better business owner. "I
have had a lot of private lending groups contact me and I haven't been turned down for equipment or open credit lines.”

**Benefits and Impacts on Organizational/Agency Partners**

In brief, the Small Meat Processors Working Group is building the capacity of participating organizations to better serve the small meat processing industry and others who serve them. Nearly 80% of respondents for whom it was relevant reported the working group had changed the way their organization works with small meat processors and other support providers. Each bullet point listed below shows specific ways they report organizational capacity has grown as a result of participating in the working group:

- **The working group is directly connecting technical assistance providers with small meat processors, which creates more targeted, effective assistance.** This point is critical given that for whom the question was relevant, 75 percent had provided technical assistance to small meat processors as a result of participating in the working group. “The working group helped us get to the topics that the industry was interested in getting help with. Having the processors come to the Working Group meetings was one of the key things for us. We could all be University or academic people sitting in a room and not learn anything. It helped [us] realize things about the industry that we never knew. The group has acted as an advisory board with industry doing the advising.” “The community colleges struggle to help the processors. Typically the smaller ones don't have many employees and don't qualify for any [state] training funds through the community colleges.” “We've done some productivity projects with meat lockers as a result of discussion with the small processors.” “At the Iowa Meat Processors Conference, we are going to be presenting a workshop on business succession planning that wouldn't have come about if I wasn't part of the Working Group.”

- **The working group is helping small meat processors and others become aware of and make use of technical assistance providers.** “The processors and the Working Group didn't know about the Center for Industrial Research and Service before.” “Twice in the past three months, some businesses were referred to me by the Farm Bureau. Is it because of the Working Group? I'm not sure, but I think so.”

- **Nine of the ten respondents said the Working Group enabled them to make better referrals.** “It's given me better knowledge so I can direct people to a better resource.”

- **Participants attending the meetings are better connected to each other and represented organizations.** “I'm interacting with people on the group with whom I would otherwise not interact. While I know some of them, I have occasion to call them. [The Working Group] has amplified those relationships.”

- **Through the Working Group, organizations are able to both contribute to and take credit for their mutual success, thereby strengthening their ability to secure more resources for continuing the work.** “We actually survey clients in regard to the projects we've done with them to capture the impact metric and we report those to our deans and the Board of Regents in aggregate on jobs retained and added. By us doing work with companies, [being] able to serve them, and capturing the impacts helps us meet our goals with federal funders and ISU.” “Instead of having it be a once-in-a-while topic, it's probably more than 50% of my time. It was maybe 5% of my time before. My organization is giving me the freedom to [do this work].”

- **The working group is educating participating organizations as they gain a better understanding of different approaches and perspectives on how to support the small meat processing industry.** “I appreciated the fact that I got some insights into IDALS and their strategy and how they thought about the Iowa meat processing industry.” “We didn't have any engineers who knew anything about meat processing [before] since they were used to working with fabrication ships.”
[Now] the engineers are learning and are helping the lockers learn there is room for improvement in productivity.

- **The working group is prompting organizations that have never worked together before to collaborate.** Seventy percent of respondents reported they participated in new partnerships or projects that they otherwise would not be involved in unless they were participating in the Small Meat Processors Working Group. "Through the working group, we had never worked with [this non-profit] before. We have plans to do so [again] in the future." "The activities with the product costing [workshop] and the Working Group led me to be involved in regional economic development groups...to dig into specific topics to explore. It tied together the Working Group, the Center for Industrial Research and Service, community colleges, and regional economic development groups." "The Iowa Farm Bureau worked with CIRAS to offer a seminar to target the small meat processors in Iowa with [ISU Meat Science Extension]. We didn't do projects with [them] before."

- **The opportunity to meet, share information, and work together through the working group is helping organizations provide better services not only to small meat processors but others as well.** "I can better refer people to the resource guidebook. [It] gives me something I can send people. It has provided us additional resources that we can make available to people quickly." "On our own, [my organization] would never have developed the [Boilerplate for Meat Processing Plants] or the resource guidebook."

- **The working group is helping participating government regulators better serve meat processors.** "We're regulators. Part of our mission is to provide outreach and we have done that for many years...[The working group] has amplified our ability to provide outreach and my goal is to educate before I regulate. Many things in the working group aren't directly related to regulation but pretty much everything is based on regulations and the success of the process."

- **The working group is helping participating organizations meet their goals and missions, with measurable impacts on the ground.** "Part of our mission is to provide outreach... This has amplified that ability to provide outreach." "[The working group] allows us to be successful when we see [meat processors] maintain employment and add to employment. The whole premise of our program is to assist companies to be more profitable and to retain more jobs and create jobs. Any time we do that and make a company become more profitable, we have accomplished our mission."

- **Participating organizations are providing funding to other group collaborators** "to help support them so they can further their work to give scholarships to processors [to attend courses] who can't afford it."

- **Organizational partners in the working group are jointly exploring future partnerships and programs together that build on each organization's skills and strengths.**

- **Participating organizations are developing a reputation for their work in supporting small meat processors, making them "go-to" organizations and building the capacity of the organization to better support the processors.** "My job has grown to become the food processing expert."

- **The working group is eliminating duplication of efforts and making more efficient use of organizational resources.** "All these people were duplicating efforts and were not really getting all of the information together to make decisions and this is really something [different] that has come out of the working group. All these diverse people were off in their own little world doing things and now they are all together."

- **The working group is helping change the culture of professional business associations to be more open to change.** "The working group has made a huge contribution to some radical changes [within the association]. The cost analysis class that we introduced to the [Iowa Meat Processors] Board and the [Iowa Meat Processors] association at the convention--sometimes you can feel tension in the air and suspicion about change but we're slowly chipping away at that...It's slowly helping people loosen their grip when they hear some successes."
The working group is changing the way participating organizations provide technical assistance. "In Meat Science Extension, our role is to work with processors from a meat processing standpoint. We have expanded to include food safety. We haven't been involved with them from a business standpoint. We're now involved in [providing support] on the business side. That's been a function of us working with the SMPWG and CIRAS." "The Meat Processor's Guidebook is used by processors and CIRAS project managers so we can tie in product costing and process flow. We're educating our project managers about process flow. They have never been pulled in to work with meat processors."

The benefits and impacts of the Working Group on participating organizations is compelling. Despite this list of successes, however, one participant remarked strongly on the need for the working group to better engage small meat processors in the work to counterbalance what he termed as "technocratic" representation. "[The Group] is engaging the small meat processors but they're really not at the table. My initial reaction was fairly negative [toward the Working Group] because my expectation was that the [small meat processing] industry would be at the table setting the agenda and they're not, but maybe there isn't the capacity to do that [or] they don't see a huge need for it. [However], I think the product coming out is valuable and the business side would probably find those [products] helpful." Put in context of previous comments from the small meat processor who observed the challenges of engaging meat processors through formal channels like the Iowa Meat Processors Association, it is more likely that the capacity needs to be built to better engage this group of committed business owners in the decision making process, rather than presuming lack of activity equates to lack of need or interest. Indeed, when respondents were asked which organization had the capacity to take on leadership of the working group once the current facilitator moves on, at least one commented that Iowa Meat Processors Association was already overcommitted and might not have the capacity to adequately lead this work into the future.

Policy, Regulation, and the Working Group

Multi-organizational coalitions can sometimes do selective, "light" policy advocacy that individuals cannot do because of their employment ties to public institutions with funding mandates that limit such activities. Such is the case of the Small Meat Processors Working Group, whose focus is to "foster the success of small meat processors in Iowa and positively impact directly marketed livestock and rural vitality"(www.valuchains.org/smpwg). Although several members representing state institutions and agencies clearly stated their role is specifically NOT to advocate for change in regulations, others in the group, such as the meat processors themselves, are more free to do so and are doing so on behalf of the industry. However, the challenge has been daunting. The following are brief highlights of policy related efforts some participants in the group have led:

- Group leadership tried to reverse a policy by the Iowa Department of Revenue that excludes small meat processors from the classification of manufacturers, a group that receives tax exemptions for equipment they buy for use in their business. A letter was signed and sent on behalf of the SMPWG to the Department of Revenue, which responded by refusing to include small meat processors as manufacturers. Some participants of the Working Group responded by sending a rebuttal signed by the Iowa Meat Processors Association. According to the SMPWG facilitator, the working group
and the Department of Revenue "went back and forth about the taxation issue and I went [to Des Moines] and visited with them. Essentially this issue is tied up by a pending Iowa Supreme court case brought on by Sherwin-Williams (the paint store) and the impact its ruling will have. The ruling is expected yet this year."

- Although not a policy related effort by definition, one member of the group previously worked to change the regulatory framework through which policies are interpreted. This skirts the difficult issue of political lobbying while creating more (and more expedient) opportunities for groups in question. "Prior to the working group in 2002, I talked to the Iowa Department of Agriculture and Land Stewardship about processing goats on farm. No rules have been changed but they changed the policy framework to come up with some new approaches [that allow it]. The Working Group has opportunities like this to change the regulatory environment without going through the work of changing the regulations."

- Another way in which the Working Group is getting at least peripherally involved in the policy arena is through regulatory channels. The Meat Processor's Resource Guidebook has become an important resource for regulatory officials involved in implementing meat industry policies on two accounts--from both an internal and a public relations perspective. The first benefit is that it has helped regulatory officials get more involved in the small meat processing industry. "I took the [Guidebook] to the regulatory director and the secretary and the deputy secretary and they thought it was a good opportunity for [the meat and poultry staff] to participate." The second advantage it has provided regulatory officials is the ability to be responsive to public inquiries. "We get a lot of calls from people wanting to start a meat processing plant and I direct them to the [Guidebook]."

The policy impact of the Working Group is a dicey one, given the differential ability of different members to actively lobby for change. However, the group is finding ways to influence policy in more subtle ways—namely, how policy is regulated and enforced.

The Future of the Working Group

Participants were asked a series of questions about the future of the Working Group given that the facilitator will be leaving in December of 2009 and the Group has yet to formally address issues related to continuation of the group. The evaluator asked these questions to initiate a dialogue about leadership possibilities. One of these question queried participants on whether the group should continue past its current grant funding which ends in August, 2009. Nine of the ten respondents said yes, citing the need to maintain relationships and continue with existing and new work. The lone dissenting voice said the Working Group would no longer be needed after August since the group had succeeded in creating a functional network that this individual expected to exist into the future without further support.

Participants were also asked whether any other groups should be participating in the Group who currently are not and if so, which groups. This question generated a wide range of responses. While all were open to the idea of having new groups at the table, five named specific groups that might be willing to participate. Groups, agencies, and organizations mentioned include:
• Producer groups such as the Cattleman's Association and the Iowa Pork Producers Association;
• More meat processors than those already represented;
• State agencies including the Department of Natural Resources because of their role in regulating hunting season (thus influencing seasonal demand for meat processing) and the Iowa Department of Economic Development;
• the Iowa Small Business Development Center; and
• the Professional Developers of Iowa, an association of economic development professionals.

Future Work To Do

Among those who thought it should continue, the following is work participants would like to see the Group accomplish in the future:

• **Update publications the Group has released.** "If it stopped now, I would have [publications] in a few years that would have little or no value."

• **Coordinate the organization of small meat processors in the state to provide market advantages** such as a) aggregating and selling product to retailers, and b) increasing their collective purchasing power by buying in bulk and getting discounts on processing supplies and/or equipment;

• Continue to **focus attention on labor issues by supporting a statewide program to train small meat processors** (including youth and adults);

• Continue to **address regulatory, business development, profitability, and networking issues** that affect the small meat processing sector;

• **Bring increased attention to the important role small meat processors can play in local economic development.** "I'd like to see more businesses developed in the small meat processing area because I know local foods is a growing interest and has real possibilities for economic development in small towns."

• **Focus on the business sustainability of small meat processors.** "It's important to maintain the businesses we have. We don't want to see them close because there is no one to take over or because there is no succession plan in place."

• **Better engage small meat processors in the work of the Group.** "[We are] engaging the small meat processors but they're not really at the table. The industry should be at the table setting the agenda..."

• **Focus on sustaining the work of the group from a financial standpoint and a human resources one.** "Very much of the [Group's] output has been driven by outside funding because the processors themselves aren’t putting resources into the Working Group. If the funding goes away, then the output probably stops. For it to continue its current formulation, it has to have funding."

Benefits Needed to Keep Current Partners Engaged

Ever mindful of the relevance of this work and keeping partners engaged, we asked participants the kinds of benefits they and their respective organizations, business, institutions, and agencies
need to receive in order to stay engaged in the work of the Working Group over the next few years. Benefits they need to receive include:

- **Providing actionable opportunities for participating businesses, institutions, and agencies to support the small meat processing sector.** "I need to see the group identify projects that need to be handled and see action taken on those projects. One of the really frustrating things is that groups meet to meet and never identify projects and take it on. So far, this group has done an excellent job of that."
- **Providing opportunities for meat processing businesses to become more profitable.** "Show me ways to make more money [and] expand my business the best way possible."
- **Connecting participants to people with whom they can frequently interact to benefit small meat processing businesses, the industry, or work.** "The networking function [is valuable] to be able to know who [people] are and to be able to interact with them."
- **Connecting participants to information by providing a "steady stream of usable products"** that they can both use or pass on to others.
- **Helping participating organizations and agencies provide better support to keep small meat processors in business.** "We are interested in opportunities for small meat processors to be in business. We need the industry to be strong and that's enough for us to stay involved."

**Meeting Format**

Part of keeping partners engaged means respecting their time and schedules to ensure they can easily participate and contribute. Respondents made the following suggestions for future meetings:

- Be respectful of meat processors' busy season (November through March)
- Schedule face-to-face meetings. Face-to-face meetings are considered by all respondents to be critical for developing strong, quality relationships and as one processor put it, "I come out of [face-to-face meetings] feeling so much better on where I'm at and that people care." Others said the face-to-face meetings "solidify relationships," are more productive, generate important side conversations, and make the conference calls effective. Everyone interviewed was willing to meet face-to-face at least twice per year.

**Future Facilitation of the Working Group**

Strong, effective facilitation and/or leadership is necessary for any group to hang together and accomplish work. The future of any group lies in its ability to adapt to changes in leadership, and this group is no exception. Leadership changes loom on the horizon for the Small Meat Processors Working Group in December 2009 when the group's facilitator is expected to leave. Given this change, group participants were asked which organization has the capacity and commitment to coordinate this group in the future if funding were available to support the work. In response,

- 50% of respondents suggested ISU Meat Science Extension;
- 30% suggested the Iowa Meat Processors Association;
- 20% mentioned the Leopold Center;
- 20% suggested a graduate student; and
• One person each mentioned CIRAS, Farm Bureau, and One Source Training, a partnership of 15 Iowa Community Colleges committed to linking labor with the Iowa business community.

However, many of these suggestions were either prefaced or followed by a "maybe." For example, after suggesting IMPA, one participant almost talked himself out of his response, saying that IMPA actually might not be the "right organization to do it because most of [its board members] are already committed and time-wise, they're full. They need the time and ability to get it done. I'm not sure if the executives on their board could do it."

Others were decidedly more convinced in their responses. "The [Meat Science] Extension ... [staff and] program are the ones who work with the meat lockers so it makes sense that their Extension program could play a role in continuing this."

In addition, some of the organizations participants named were not necessarily those with the capacity to take on leadership of the group, but those they would like to see as the leader.

I'd really like to see the IMPA incorporate that into the work they do but they aren't in a funding position to staff that kind of operation. I think that's why it's useful to have it done at ISU but in the long run, it needs to morph over into [the meat processing sector].

Still others offered other points to consider as the group prepares for the change.

ISU is clearly organizing staffing and keeping it going through Arion. I don't see anyone else stepping up. That's one of the downsides of not having the meat processors participating [deeply enough]; they've been mostly consumers of the group but don't have a tremendous vested stake in it. I could be wrong, but I don't see [the meat processors] putting pressure on ISU to keep it going even if it came to that point and people need to request it. The Meat Science [Extension] folks have been involved. They come to the table and add input but they are also consumers [of the group] and so if you don't have a champion, you don't know where it lands. Arion has a vested interest in this since it's tied to his program of study and there are tangible benefits for him. So it works really well but how do you keep that dynamic going? I don't know what institution at ISU that you hand this off to with the same motivation and level of interaction. Arion has done a good job of cultivating relationships with institutional representatives, processing plants, and families in the business so he has a lot of personal relationships that don't necessarily transfer.

One idea for sustaining leadership of the SMPWG has been to coordinate more closely with the Iowa Meat Processors Association by meeting with them once a year. Respondents were polled for their reactions to this suggestion and had the following to say:

• "It would get the people in the working group to meet all the members of the IMPA and it would be very beneficial to know them and how operations actually work." Additionally, another respondent remarked that it would strengthen relationships between IMPA members and all participants of the working group, only some of whom have had regular contact with IMPA in the past.
• "It would give us a deeper understanding of some of the issues they have. It would provide the IMPA Board some benefits that they could see there are lots of different people from different sectors interested in seeing their industry prosper."
• "It would provide a face, more connections across organizations, and you're more likely to see them be more supportive. I think it's essential."

In summary, respondents expect face-to-face meetings with the IMPA Board to build knowledge and trust within both groups and lead to more successful work together because of the joint support that would arise from such a relationship. Another respondent, while also supportive of the idea, suggested that "meeting with the IMPA Board is great but I don't think it stops there—what is the best series of approaches" that will best serve the needs of small meat processors in the state?

The leadership question is critical to the future of this group. The Small Meat Processors Working Group is neither the first nor the last group to tackle this issue, but the ability of the group to plan now for this change will determine the way Iowa's small meat processing sector is supported in the future. What the Working Group offers that no other group alone does is that it provides coordinated, targeted support for a whole range of business development challenges facing the industry and ties them together in a way that no single service provider or government agency can. The value of this is a more holistic approach to supporting an industry that until this point has struggled with resolving those issues on a piecemeal, business-as-usual basis—an approach that so far has proven inadequate for reversing the decline of the industry in the state. There is general consensus among group members that relying on volunteer leadership is not an option. "Volunteers won't cut it. Some burnout is [already] happening with busy volunteers [and] some...have a higher commitment to these programs than others." With funding for a coordinator firmly established as a prerequisite for the group's survivability, several participants aptly noted in the interviews that the way in which the group is funded has implications for the way the group is managed. "If it becomes more connected to IMPA and it's more of a working group of the [meat processing] businesses, it would change the dynamics significantly." Another said, "[If] it becomes a Farm Bureau [led] group, it would take a very different direction in terms of collaboration." These remarks speak to the broader issue this group is facing and that is whether it needs a) a new leader who will have an interest in particular outcomes and leading the group in a specific direction based on predetermined goals, some of which may or may not be aligned with those of the group, b) a new coordinator who helps brings about some kind of a common action or movement but has no stake in either the direction the group takes or the outcome of the efforts, or c) a new facilitator who has an interest in the outcome but not how the group gets there. Ultimately, preserving the hallmark of the group, which has been collaboration for organizational/agency and industry benefit, should be a guiding element in framing future conversations the group has about leadership, coordination, and facilitation. The benefits and impacts chronicled here show a there is measurable change and value in continuing this work into the future.
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