

Swine System Options For Iowa 1999



**Proceedings of a conference
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at Iowa State University**

*Sponsored by the
Leopold Center for Sustainable Agriculture
ISU Extension
Iowa Farm Bureau Federation
Iowa Pork Producers Association
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Thanks to the staff of the Scheman Building and the office of Extended and Continuing Education for their assistance in coordinating and presenting this conference.

Many of the foods served at the conference were "Iowa-grown" products and the conference planners appreciate the cooperation and contributions of the farmers who provided items for the meals and snacks.

Pork and honey from Audubon County Family Farms

Flour for rolls and muffins from Paul's Grains, Laurel

Garlic for soup from Cleverly Farms, Mingo

Eggs for muffins from TJ Family Farm, McCallsburg

Welcome

Dennis Keeney

Dennis Keeney is director of the Leopold Center for Sustainable Agriculture, a position he has held since 1988. Keeney is a professor of agronomy at Iowa State University, and past president of the 12,500-member American Society of Agronomy. He holds B.S. and Ph.D. degrees from Iowa State University and a M.S. degree from the University of Wisconsin-Madison where he was a long-time faculty member.

I would like to thank you for sharing your day and your knowledge with us. Our objective for the day is to leave with all of us knowing more about alternate swine systems and more about each other.

Iowa's swine industry has always been in transition. But the sea change that started a few years ago leading to concentration and vertical integration, coupled with record low prices and environmental issues, has left us reeling.

The sponsors and the planning committee of this conference have developed a program not only to discuss production and environmental management in low-cost swine systems such as hoop structures. We also are examining through marketing and added value swine production systems how swine producers and all farmers can get a higher percentage of the consumer dollar.

We will hear more during the sessions,

and we will taste it at breaks and lunch, where many of the foods served will be grown in Iowa, some locally in the Ames area.

I want to acknowledge the many sponsors of the conference:

The Leopold Center, and Rich Pirog, who coordinated the conference;
ISU Extension and the ISU College of Agriculture;
Iowa Farm Bureau;
Iowa Pork Producers Association;
ISU Pork Industry Center;
Iowa Beginning Farmer Center;
Practical Farmers of Iowa;
ISU Extension Sustainable Agriculture Program; and
ISU Research and Demonstration Farms.

The members of the planning committee are listed on the conference program in your packet. I would like all members of the planning committee to stand and be recognized. Thank you so much.

We encourage you to visit the displays of the conference sponsors which you will find in the lobby and break areas. Please stop by the Leopold Center display and sign up for free *Sand County Almanacs*, Iowa River maps, and the newly published full-color guide on IPM for Alfalfa Insects. The prize drawing will take place at our closing coffee at 4:00 p.m. this afternoon.

I also want to recognize the vision and leadership of Dr. Lauren Christian. As you know, Lauren Christian lost a courageous battle with cancer last fall. Lauren Christian was a fantastic scientist, teacher, and person. He was a guiding light for the first swine system options conference and will be greatly missed by all of us. Please join me in a moment of silence in his memory.

This program is based on the successful Swine Systems Conference held three years ago. It seems that more information is transferred by listening to the stories of producers including their production, management, and marketing.

Some of the research we will talk about today, particularly that at the ISU Rhodes Farm, is sponsored through the Leopold Center and its swine hoop research initiative, the so-called "Hoop Group." The Leopold Center has had great success with interdisciplinary approaches to problem-solving when they are based on partnerships between farmers and university researchers and educators. We saw the en-

ergy created from the first conference and that it was generating enthusiasm for such a group. So we helped put this group together. There is some information on this initiative in your packet and in the information booth.

The program starts with a panel covering many of the issues in swine production. It will end with coffee and fellowship. In between there will be much information you can use. Rich Pirog will be giving us some pointers on how to get through the day following the panel.

At the conference three years ago, Dave Struthers, who farms near Collins with his brother Dan and his father Don, learned with us about the hoop structures. Several months later Struthers Farm Inc. put up four hoop structures for finishing hogs. Dave is the part-owner in the operation that includes a 900-sow farrow to finish operation, 800 crop acres, and a 50-head ewe flock. The farm currently has 12 hoop structures. Dave is an active member of the Iowa Farm Bureau and the Pork Producers Association. He hosted a PFI field day last year.

For this conference, Dave is not only a participant in one of the concurrent sessions, but was also on the planning committee. Dave will moderate the general session this morning.

Dave, I turn the program over to you.

Opening Remarks

Dave Struthers

Dave Struthers is part owner of a family farm operation near Collins, Iowa. The operation includes a 900 sow farrow-to-finish operation, 800 crop acres, and a 50-head ewe flock. They use several different production facilities, including 12 hoop structures for finishing.

Dennis is retiring from his post as director of the Leopold Center and has assumed the role of president of the Iowa Environmental Council — it will be very good for the farmers to have someone in that position with an agricultural background who will base decisions on facts, and not just emotions.

As a pork producer (like many of you here today), we are facing many challenges at this time. We are going through an extended and historically low downward price cycle. We face competition from large integrator- and investor-owned corporate facilities. We face intense scrutiny from the public regarding food safety, animal welfare, and environmental policy. We have government agencies such as EPA wanting to take away subtherapeutic antibiotics and earthen-basin manure storage based on theories and perceived threats, not on facts and science. Hogs, once

known as the mortgage lifters, currently are the mortgage makers. Will it always be this way? Of course it won't.

Pork production, and all of agriculture, is undergoing many changes but change is good. Dennis mentioned that in his days on the farm there were many changes; we still are going through those changes and I think the change is for the better. The consumer wants a healthy and nutritious product. They are also concerned how that product is produced.

We're here at a conference entitled "Swine System Options." Most of the options you'll hear about today have pigs in fresh air, sunshine, and bedding; things that are contrary to forced ventilation, fluorescent light, and concrete. Are those things bad or wrong? No, they are not. But what you'll hear today is from producers who have facilities that include fresh air, sun-

shine, and bedding. They do this perhaps to fill a niche market — maybe a certain avenue of production — in a so-called “natural” way. Many producers went this way for economic reasons — low-cost facilities that still give quality gains through that unit. Some went for healthier surroundings, for their workers, themselves, and their hogs. Some went that way for social reasons — because of the hog industry changes we’ve gone through — by the time you dig a hole on a farm, people think you are going to put up another large, “stinking” hog building.

Hog prices will become profitable again — we’ll ask John Lawrence how soon that will happen, and we hope he’ll have a good, quick answer for us. But hogs will be more than just an expensive hobby, they will be a profit maker in the future.

Those of us who are speakers today want to hear your questions; we may not know the answers to all of them, but we’ll give you true and honest answers that come from our experiences. This conference was designed for pork producers — we were involved in the planning, and as you’ll see from the program, we are involved in the discussion. Most of the speakers on the program are pork producers. Almost every session includes a pork producer. We’ll be open for questions during all the sessions, and especially at the closing coffee from 3:30 to 4:00 p.m. You can only go to three concurrent sessions, so if you have questions from another session, we’ll be there at the closing coffee to answer those questions.

Will Iowa Remain a Leader in the Global Pork Industry?

John Lawrence

John Lawrence is an Extension livestock economist and associate professor of economics at Iowa State University where he serves as director of the Iowa Beef Center. His primary concerns include cattle and hog price outlooks, livestock, and the meat industry. Prior to joining Iowa State in 1991, he held a similar position at the University of Minnesota. He was raised on a crop and livestock farm in Southwest Iowa; Lawrence operated this farm from 1977-1980. He was also a herdsman on 300-sow feeder pig operation in 1980-81. He holds B.S. and M.S. degrees from Iowa State University, and a Ph.D. from the University of Missouri. He was named an honorary Master Pork Producer in 1998.

One of the greatest honors I've had was that Master Pork Producer award. When I was a producer, I was the Mills County Pork Producers president in 1979. I still remember some of the same debates on policy then that I heard again last January. We're still fighting some of the same battles, but the intensity and motivations of those battles have changed.

Perhaps we need to talk about price outlook, and if questions come up, I'll respond, but I was originally asked to talk about whether Iowa will continue to be the leader in the pork industry.

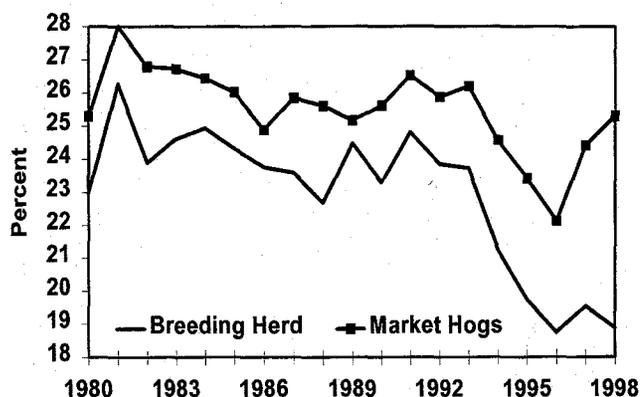
You've heard me talk before about what's happening to the pork industry in Iowa and elsewhere, and why changes are occurring. Let's first take a snapshot of where we've been and where we are; then we can look at what it will take for us to move forward.

Because I'm the director of the Iowa Beef

Center, I'm often asked about that center's objective. Put simply, it's to make Iowa number one in the beef industry. During 1968-71, we were number one in the number of fed cattle marketed. That's nice, but I want to be number one in food quality and safety, in technology adoption, in value-added exports, and in producer profitability. I think that will make us a leader in the nation as far as our producers are concerned. As Iowa evaluates its number one position in the pork industry, we need to recognize the importance of maintaining our production and slaughter infrastructure, because our slaughter infrastructure, working as a system, keeps the profit potential in Iowa. I think it's also still important that we continue to manage our production for the right reasons, for reasons that are right for individuals, and if the state happens to benefit from it, more power to it. And I think it will.

Here's a brief history of Iowa's pork sector, given that we worry about Iowa's share of

Iowa's Share of US December Hog Inventory



production. These numbers reflect December inventory: You've all seen this picture before: the boxed line is the market hog inventory (as a percentage of the U.S. total); the straight line is the percentage of the U.S. breeding herd.

We did a lot of talking and hand-wringing prior to 1996 when both of those lines were headed down. In fact, if you run the math on it, you can pick the day, shortly after the year 2000, when the last hog crosses the state line. Well, that obviously wasn't going to be the case. Particularly in 1997 and 1998, we rebounded sharply on market hogs in the state, but our breeding herd continues to lag behind. In fact, if we took out some of the large sow units in the state, that number would drop off even further. This trend does point to a production system of putting the finishing hogs, which use the corn, where the corn is. About 80 percent of corn is used from the finishing phase. That's Iowa. But a very small percentage of the feed is used by the sow herd (in terms of breed to wean). "Put those sows anywhere" is the type of system that's being used today. It

doesn't have to be that way, but that's what has occurred.

As we talk about corn prices, the only state cheaper than Iowa is Minnesota. Having been in Minnesota, I know they don't really brag about that a lot, at least the corn producers don't, but Iowa is a place that will maintain leadership in the feeding of hogs, if you're talking sheer numbers and sheer pounds of the cheapest grain in the country—and we have almost the most packers in the country, too. The question of who owns those animals and who benefits from that production is still an open debate. And there are lots of ways of benefiting from that production: as a contract grower, as a service provider So there will be benefits created for the state, different from what we have become accustomed to, but there still will be benefits.

So let's take a snapshot of where Iowa is today. This is based on some research we did last summer. Glenn Grimes, Marvin Hayenga, and I surveyed U.S. pork producers. *Pork 98* magazine was a cosponsor, along with NPPC, PIC, Land O' Lakes, DeKalb Genetics, University of Missouri, and Iowa State University. Most of what you've seen have been the national numbers by size of farm. But we also sliced these numbers by location. We have some regional analyses on farms from the 1,000 to 50,000 head a year marketed range that I'll share with you here. Iowa was one region; we also broke out the Western Corn Belt, excluding Iowa, which contains Minnesota, South Dakota, Missouri, Nebraska, and Kansas, and then the Eastern Corn Belt, and then all other states.

How does Iowa compare? Are we different? Are we behind anyone else? Ahead? Where do we stack up? First, the Iowans' operations were slightly smaller, but I would suggest that those 420 that responded to us were larger than the average Iowa producer, marketing nearly 4,000 a year. These are commercial-size family operations.

Those 18 producers in the United States that sell one-half million hogs per year produce 24 percent of the nation's hogs, about the same as the total that all Iowa producers market in a year. Now some of them are in Iowa. If you count off the first 18 here (in the auditorium today), we can probably cover that in about three rows. Think about what that means as far as management implications and decision making and ability to change.

Where will the next generation of farmers come from? These are the primary operators of a business. Notice that Iowa actually had one of the younger sets of producers of any of the other regions. We had 6 percent of producers who were 30 or less; 7 percent were over 60. In the Eastern Corn Belt, 7 percent were under 30, and twice as many were over 60. I expect we'll see some attrition in those regions. (If we could save those guys over 60 and keep them in the business, I'm not sure how much they'd enjoy it. There comes a time when it's nice to quit raising hogs.) As we can see from this, the bulk of them, essentially sixty percent, are between 30 and 50. And Iowa is a little bit younger than the rest.

Average Marketings, 1997

Iowa	3,860
WCB-IA	4,942
ECB	4,921
Other	6,001
Nation	4,777
50-500	133,860
500+	1,332,045

Age Distribution of Producers

	Iowa	WCB-IA	ECB	Other	Nation
30 or less	6	6	7	3	6
31-40	31	27	23	28	27
41-50	35	34	34	33	34
51-60	20	23	21	23	22
Over 60	7	10	15	13	11

Percent of Litters Sired by AI

Region	1997	1998
Iowa	16	19
WCB-IA	23	26
ECB	18	21
Other	12	16
Nation	18	21
50-500	72	
500+	84	

Percent of Operations in Networks

	Inputs	Feed Mill	Market	Information	Genetic	Far-Fin	Pigs	Other
Iowa	7	5	15	6	4	6	11	1
WCB-IA	7	6	17	11	6	7	14	1
ECB	11	3	13	9	9	7	6	1
Other	7	5	8	8	4	6	6	1
Nation	8	5	14	9	6	7	10	1

Percent of Production in Networks

	Inputs	Feed Mill	Market	Information	Genetic	Far-Fin	Pigs	Other
Iowa	8	4	18	9	9	5	14	1
WCB-IA	11	7	20	16	10	11	22	1
ECB	19	5	17	15	17	8	8	2
Other	6	12	12	12	8	6	9	1
Nation	12	7	17	13	11	8	13	1

We talk about technology adoption being important in keeping up with a changing industry, and one measure of that is artificial insemination (AI). Is AI in Iowa lagging behind the rest of the nation? No. In 1997, 16 percent of the litters were sired by AI. They bumped it up; they expected in 1998 to sire 19 percent of litters by AI, whereas the nation's respective percentages as a whole were 18 and 21. The larger producers came in at 72 percent and

84 percent. That's because they have adopted that technology a little more quickly than the rank and file producers.

Another thing we've talked about a lot with mixed acceptance as an innovation has been networking: interdependence, working together to achieve things one cannot achieve alone. We often think of Minnesota being a place where there's a lot of networking going on; it's often been said that the people in Northern European who could get along with one another and be in a co-op immigrated to the Dakotas and Minnesota; anyone who couldn't stand to be in a co-op immigrated to Iowa.

If you look at the different types of networks (tables at left), there are input purchasing, feed milling, marketing, information sharing, genetics, farrow to finish, feeder pigs, or other kinds of producer co-ops. Again, that Western Cornbelt less Iowa category consists of Minnesota, along with the Dakotas and Missouri. There you see a little more networking activity. But compared to the nation as a whole, how does Iowa stack up? On input purchasing, just a little bit below average. On the feed milling, we do a little less; on marketing we do about the same. This surprised me, as many markets as we have compared to the rest of the nation (e.g., Arizona and South Carolina); we actually do more networking of markets than they do. In information, genetics, and farrow to finish, there is not that much difference. So even though we see ourselves as independent, secretly (on a survey) you guys will admit to working together more than you used to.

What about marketing contracts? Neil Hamilton is going to talk about that. Iowa and Minnesota are the heart of price discovery right now.

In 1997, Iowa precommitted 41 percent of the hogs sold. The national average (again, excluding big ones) was 49 percent. We're a little bit lower on this than everyone else, but not much different from the Western Corn Belt, and higher than the Eastern. In 1998, everyone jumped up a little bit.

Our estimated total for the nation in 1997, with the large producers thrown in, was that 57 percent of the hogs were under some sort of prearranged agreement, either owned by the packer or under contract. Our estimate for 1998 was close to two-thirds. Glenn Grimes completed a survey on January 1999 marketings, and those numbers are still very close to our 1998 estimates.

As far as packer ownership and contracting, our numbers would suggest that 33 percent of the hogs are on the open market; Glenn's survey said it was about 36 percent. We asked those who did not have a contract, "If you were offered one today, would you be interested in signing one?" And as you can see, 55 to 60 percent said yes. Will the use of contracts increase? Very likely. When packers start offering them again, there are people out there who'll be interested in looking into it.

Now let's discuss whether Iowa is going to stay the nation's leader. Are we going to grow? We asked, "How many hogs are

Percent of Marketings Pre-committed to a Packer

	1997	1998	Not Currently But Interested
Iowa	41	46	57
WCB-IA	42	48	60
ECB	35	34	55
Other	75	75	63
Nation	49	52	58
50-500	82		
500+	92		

Percent Change in Average Sales

	1996-1997	1997-1998	1997-2000
Iowa	10	23	17
WCB-IA	7	16	23
ECB	4	12	32
Other	9	10	35
Nation	7	16	26
50-500	18	27	66
500+	19	13	27

you going to market in 1996, 1997, and 1998 (the survey was done in March and April 1998). And how many do you plan to market in 2000?

I found this interesting, and a little disturbing. Iowa producers grew from 1996 to 1997 by 10 percent, more than anyone but the very largest. They grew and sold hogs in 1997. They then grew 23 percent from 1997 to 1998; that's the bad news.

Percent of Production by Price Level With \$2.50 Iowa Corn

Region	\$37	\$40	\$43	\$46
Iowa	7	30	62	84
WCB-IA	9	34	60	85
ECB	17	40	66	84
Other	6	26	52	65
Nation	10	33	61	81
50-500	6	21	61	96
500+	9	51	89	98

Limitations to Expansion, 1=No Effect, 6=Major Effect

	Facility	Operating	Good	Local	Environ	No one to	Market	Forecast	Afraid of
	Loans	Loans	Employees	Opposition	Regs	take over	Access	Profits	Big Farms
Iowa	3.33	3.02	2.95	2.84	3.57	2.80	2.91	4.18	2.80
WCB-IA	3.29	3.02	3.20	3.56	4.12	2.78	2.99	4.13	2.94
ECB	2.85	2.61	3.24	3.23	4.03	2.66	2.77	4.03	2.94
Other	3.10	2.87	3.27	3.34	4.23	2.78	3.43	4.10	2.96
Nation	3.15	2.88	3.15	3.22	3.95	2.75	2.97	4.11	2.90

Selling hogs in 1998 wasn't such a good idea. But then between 1997 and 2000, Iowa production actually drops. Producers are saying, "I produced more hogs in 1998; and I'm not going to produce them in the year 2000." The rest of the nation grew a little more slowly in 1998, but then they planned to produce 23 to 35 percent more hogs in 2000 than in 1997; Iowa was not. In this producer survey, Iowa pro-

ducers planned to peak in 1998 and then get out. The question is whether they got out before the fourth quarter of 1998. If you look at the bigger producers, you'll see that they have some aggressive growth plans.

Now, I imagine all those 2000 plans are being reevaluated, if not totally scrapped, as we speak. No doubt last fall's prices had an impact on those plans.

The other thing we asked people is what their stay-in price is. If the price of corn in central Iowa is \$2.50 per bushel, what price would you need to stay in business for five years? This information is shown by percentage of hogs. So at \$37, 7 percent of Iowa's hogs would stay in. The Western Corn Belt was the same, and the Eastern Corn Belt was a little higher; the largest ones are going to be out of business, too. If you get to \$37 hogs, it won't last because no one will produce at that level.

Let's take it up to \$40. About 30 percent (these have already been added in), the very largest producers, say they'll still hang around. At \$46, 84 percent of Iowa producers will stay in. (We've averaged \$47 to \$48 over the last decade.) Sixteen percent will not be here if \$46 is all we can do. That's consistent with earlier graphs. Basically producers would rather sell corn at \$2.50 than raise the hogs.

What, if anything, is limiting my expansion for growth, if in fact that's an objective? This table shows "no effect" ranging up to "major effect" for limitations such as facility and operating loans, good employ-

ees, local opposition, environmental regulations, no one to take over the business, market access, forecast profits, and fear of big farms. Were people willing to quit just out of fear? I'm proud to say that's a low score. We're not quitting just because there's a bully in the neighborhood. Facility loans are a concern. (Some of the options you'll talk about later today at this meeting will make facility loans less of a concern. They've found a way to lower it.) Local opposition to local producers isn't a concern. We do worry about environmental regulations a bit; and you've got be profitable. Across the Western Corn Belt, responses were similar; you get to the rest of the nation as a whole, and there's not a lot of difference. Where does that leave us? There's nothing about Iowa's rank and file producers that appears to be different from any place else, if you look at technology like AI, use of networks, and the like. We're the same as peers in other states. We may be different than bigger producers who have different objectives than to have diversified farms. It gets down to inherent advantages like competitive grain prices, which Iowa has, and things like management. That's what you're here to learn about.

Not to get into a heated philosophical debate, but let's think again about separating labor from management. The reason is that we can spend a lot of time working, but when do we have time to think and plan and develop strategies to move our operations ahead if we're always on the skid loader?

Access to markets is going to be key to competitiveness; you're probably sitting in a better position than anyone in the country, but it's still a concern. Iowa has an advantage, but one key factor is that we must develop a food chain mentality. This is where the PQA III requirements come in; this is where we may be talking about on-farm HACCP or ISO 9000 standards in our type of systems. You need access to technology, appropriate for the operations you are managing, not just the gee-whiz little gadgets that come out, but using what is appropriate. Don't think five or six years before you adopt it; evaluate it quickly. If it's what you need, how do you put it to work? Clearly, there's an early adopter advantage; we know that for years. Access to information is important. Internal information, keeping a running tab on where you are within your operation, is critical so you know what's going on and can make decisions, but you also need access to external information. What's going on out there? What's available to me? Are there threats to be aware of?

We're also seeing more privatization of information. The work's not all being done at land grants and given to you at relatively low cost; how do you access other information?

Knowledge-based decision making is another element. That means smart people win, the thinkers who have internal sources of information, who can make decisions that make profits will come out ahead. You must use your gray matter to make decisions that make profits. You

have to build that human capital and build the skills to make profitable decisions.

Let's go back to this issue of labor and management. If you have a high-labor system, maybe that's fine. But where do you have time to think, learn, come to conferences, to share information with peers, and pick up new ideas to take home and use? If you're counting on a return to management on that bottom line, take your revenue and subtract feed and facility cost and everything else, and what's left you can call return to management. And if it comes out positive, that means you managed during that year; you made decisions.

To wrap things up, let's look at management for the millennium. This involves operational issues and attention to details daily. That's what you people do best on an ongoing basis. The eye of the master still has an important role.

You have tactical means of developing efficient production systems around the resources you have, but that includes financial management and risk management. How do you balance those to achieve your

long-term goals? Strategic management means doing the right thing; that implies being consumer driven and probably looking at appropriate alliances, in order to get something you can't get on your own. That may mean access to a food chain, access to private information, and maybe access to a low-cost input or technology, and goal-driven decisions. Part of strategic management involves setting goals for your business and your family and then making decisions to get there.

Finally, think about innovative management, defined here by a Wayne Gretzky quote you've all seen. Gretzky is great because he "skates to where the puck is going to be, not where it is today."

These are some challenges. If Iowa's going to remain a leader, with producers in the driver's seat, it does come back to them and the decisions they make. The resources are clearly here. Packing facilities is one part of that; grain costs and the ability to develop production systems that incorporate livestock into a cropping system are other advantages. But the key comes back to management decisions.

An Overview of Swine System Options

M.S. Honeyman

Mark Honeyman is coordinator of the Iowa State University Agricultural and Home Economics Experiment Station's Research and Demonstration Farms, a statewide network of 11 research sites. He is an associate professor of animal science at ISU, teaches courses in swine management and animal nutrition, and advises undergraduate students in animal science. Honeyman conducts research in swine nutrition and production focusing on alternative feeds and systems. Previously he was a partner in his family's farming operations in southwest Iowa. Honeyman received the B.S., M.S., and Ph.D. degrees from ISU.

Introduction

My father was a book lover and an avid reader. One of his favorite poems was "The Road Not Taken" by Robert Frost. It is a famous and familiar poem. The poem has become a favorite of mine, too. It describes the choice confronting a traveler standing at a fork in the road, the choice of which road to take. The poem concludes by saying "I took the road less traveled, and that has made all the difference."

In planning for this talk and this conference, I realized that all of us have been confronted with the dilemma of choice and that we, collectively, have chosen the "road less traveled" in our thinking, planning, management, and marketing related to pigs and pork.

The popular, heavily traveled road in pork production is familiar. It is a faster, riskier, and bumpier road that often bypasses rural communities and many independent farmers.

Our "road" is a little slower, a little more scenic, a little dustier, a little safer. It is the approach of alternative swine production and marketing. It is a road consciously chosen for its long-term attributes.

It is gratifying to see so many of you interested in this area. I believe that the approaches discussed today will result in better rural communities, better farms, healthier farmers, a better environment, and higher quality pork. I applaud your collective choice to "travel a road" that is less developed, less known, but has greater rewards.

"Option" is defined as the power or right to choose; the freedom of choice. The concept of choice is fundamental to this conference, fundamental to alternative swine production, fundamental to sustainable agriculture.

"System" is defined as an independent group forming a unified whole. This could include a group of independent

practices or concepts forming a unified whole swine management approach. It could also apply to a group of independent farms networked to produce and market pigs.

Swine system options include an array of swine-related areas, including housing, nutrition, breeding, manure, health, marketing, and others. The discussions today will be appropriately wide-ranging. They will include hoops, outdoor systems, remodeled facilities, bedding, various feeding approaches, a variety of breeding schemes, composting, and marketing niches and networks.

Swine system options or alternative pig production systems consist of a combination of these areas plus keen management skills and superior animal husbandry or stockmanship. The systems usually are environment-friendly, pig-friendly, producer-friendly, and community-friendly. It also is expected that the systems are consumer-friendly, producing high-quality, wholesome pork.

The swine industry has been making headlines lately. It is an industry experiencing profound changes. In the Midwest, there are concerns about the changing structure of the swine industry and its impact on independent family farmers, rural communities, market access, and whether the industry would leave this region. Raising pigs has been a key agricultural endeavor here for a long time.

There are serious environmental concerns related to odor as well as surface and

groundwater contamination by swine manure. Pig farms have grown in size very rapidly, generating very large amounts of manure. The number of pig farmers is declining annually. For example, in 1992 Iowa had more than 30,000 pig farmers and in 1997 there were less than 18,000 farmers. Some are raising concerns about animal care and welfare in current popular confinement systems. The farmers and workers who work in totally enclosed confinement systems are reporting health problems, usually respiratory ailments. Currently, the Food and Drug Administration is seriously questioning the use of subtherapeutic levels of antibiotics in livestock feeds. And we have recently experienced the lowest pig prices in recent times, creating losses and eroding the equity of many farmers.

In light of all these concerns and problems, alternative swine production and marketing approaches make a great deal of sense. When the current conventional systems are creating profound and widespread concerns, we are compelled to look elsewhere for solutions, to think "outside the box", to try new approaches, and to develop new strategies. Probably, many of the problems the swine industry is experiencing are inherent to the current conventional system that is being widely replicated.

Alternative swine production systems have a number of common characteristics. The systems allow more freedom of movement and choice to the pig. Therefore, the systems require a unique style of husbandry or stockmanship. The systems rely

less on equipment, automation, and buildings to control the pig. Bedding is frequently an integral part of the system. Solid manure is generated. The systems are less capital- and energy-intensive than conventional confinement systems, and therefore, have lower fixed costs. The systems may require more labor and on-site management. Frequently the systems are more sensitive to weather and season changes, because the pig environment is less controlled. For the farmer, the systems offer more flexibility, more versatility, and thus less risk than other more capital-intensive systems with single-purpose buildings. The alternative systems also are well-suited for producing pork for specialty or niche markets.

What we have learned about hoops

Let's review what we know and what we have learned. First, a closer look at hoop structures. Certainly no other innovation recently has created more interest in alternative systems than hoops.

The first system I will review is hoops or hoop structures. Hoops have become quite popular in Iowa in a short time. Since 1996, we estimate over 1,500 hoops have been built in Iowa for raising pigs. These tent-like, low-cost structures are easy to build and quite versatile. Most are used for feeding grow-finish pigs. They work very well for gestating sows. Hoops are also used for gilt development, isolation facilities, housing for light pigs, and breeding barns. Some farmers are farrowing in hoops and putting early-weaned pigs in hoops.

We know that most hoops are used for finishing pigs and that the total cost of production is similar to confinement, although the cost structure is different. Hoops have lower fixed costs and slightly higher variable (bedding and feed) costs on a year-round basis. Hoop pigs require about 10 percent more feed in the winter because they are in a colder environment. Depending on bedding quality and the manager, it takes about 200 lbs. of bedding per pig. The bedding pack, although quite variable, has zones that generate heat. At cleaning, the manure composts easily when piled, reducing volume considerably. Internal parasite (worm) control programs need to be aggressive in hoops because the pigs have contact with their feces. Otherwise, the pigs in hoops are quite healthy. Behavioral studies of pigs and surveys of farmers show that both the pigs and the farmers seem to like hoops.

Hoops work well for housing gestating sows. Overall costs are competitive or lower than for crated gestation confinement systems. In hoops, the sows live in groups on bedding. Feeding stalls are important to control individual sow feed intake, to minimize fighting, and to manage the sows as individuals. I think that individual feeding sows are a necessity. Hoops with sows require little bedding and once-per-year cleaning. Batch farrowing; i.e., moving large groups of sows in at a time, works better than introducing small numbers of sows. Sow feet and leg problems are greatly reduced. Reproductive performance has been similar to other sow housing systems. Rooting behavior in the hoops has not been a problem.

Iowa State University (ISU) has an interdisciplinary team of researchers working on hoops called "the hoop group". It includes the individuals listed in Table 1. Encouragement and funding by the Leopold Center for Sustainable Agriculture has been important to this work and is deeply appreciated. Work has focused at the ISU Rhodes Research Farm in central Iowa, comparing finishing pigs in hoops and confinement. Pigs of similar genetics were fed identical diets, managed by the same staff at the same location. Two groups were fed, one in winter of 1997/98 and one in summer 1998. Results of this work are shown in Table 2.

In winter, the hoop pigs grew slower and were less efficient than the confinement pigs. In summer, hoop pigs grew faster and were more efficient. If we combine these two groups on an annual or year-round basis, the results are shown in Table 3. On a year-round basis, there were no major differences in feed intake, growth rate, feed efficiency, mortality, or lights for pigs in hoops compared to confinement.

The pigs were scanned with real-time ultrasound before marketing. The results are shown in Table 4. In the winter group, the efficiency of lean gain was 8 percent better for the confinement pigs. All other measures were similar. The winter group was a fatter group - about 47 percent FFLI (Fat Free Lean Index). The summer group was leaner (50 to 53 percent FFLI) and there were several differences. The confinement pigs were leaner with .86 vs. .97 in. of backfat, had 9 percent larger loin eye areas with 6.4 vs. 5.9 sq. in. LEA (Loin Eye

Area), and an overall greater percentage of lean, 50.2 percent vs. 52.8 percent FFLI. Lean gain and efficiency of lean gain were similar for the two housing systems.

The scan data averaged over one year are shown in Table 5. On a year-round basis, pigs in confinement seem to be leaner than pigs in hoops. This may be a result of feeding identical diets to both systems. Many farmers report adding a fibrous feed to hoop diets which may alter this effect of less leanness in hoops.

What we have learned about outdoor farrowing

For the last nine years, ISU has been researching and demonstrating outdoor or pasture farrowing at the ISU Western Research Farm, Castana, IA. Major work has focused on comparing piglet mortality in different styles of floorless outdoor farrowing huts. The English arc-style hut was superior with less than a 4 percent prewean mortality rate. The other huts had higher mortality, up to 20 percent. We think this is a result of size, shape, and having the door in the corner rather than the center. Size, however, is not a major factor. When we compared three sizes of English style huts, there was no difference in piglet mortality. We tried fenders on these huts and found no advantage compared to using rollers or doorway barriers. Early weaning is compatible with outdoor farrowing if nursery flow is adequate. Alfalfa grazing of gestating sows works well and can reduce feed needs by about 50 percent. Budgeting work shows that outdoor farrowing is cost-competitive and

may have advantages when coupled with early weaning or hoops for gestation.

What we have learned about deep-bedded Swedish feeder pig production systems

A small deep-bedded Swedish feeder pig production system was demonstrated for two and one-half years at the ISU Armstrong Research Farm, Lewis, IA. Over 3,500 visitors observed this demonstration. The breeding and gestation of the sows were performed in a hoop. The matings were 70 percent artificial insemination and resulted in a 95 percent farrowing rate. Litter size and pig birth weight were excellent. The sows were farrowed in a remodeled 1950s-style farrowing house using farrowing boxes. Prewean mortality was very high (>27 percent) and occurred primarily in the first three days after birth. Results are shown in Table 6.

At 10 to 14 days after farrowing the boxes were removed and group lactation of 10 to 14 litters was allowed. The group lactation worked well. The pigs were weaned at about five weeks of age by removing the sows. The pigs remained in the same setting and in the same group to minimize weaning stress. The pigs remained together for 26 days after weaning for a nursery phase. Growth rate without feed antibiotics was 1.22 lb/day (Table 7). A comparison of this Swedish system performance to the top one-third of ISU Swine Enterprise Record farmers is shown in Table 8. Because of large litters and high conception rates, the Swedish system was superior to the ISU Record averages. We

plan to try the system again, but will farrow the sows in farrowing crates and move litters to group lactation at 10 to 14 days of age. This approach should make the prewean mortality more manageable.

Conclusion

There are many future challenges regarding alternative swine production and marketing systems. Farrowing and rearing early-weaned pigs in hoops is an area of interest. Marketing networks for natural pork and organic pork are starting. Strategies to raise pigs without antibiotics and organically are needed. All the systems need refinement. We are past the feasibility stage and are moving rapidly to the fine-tuning stage.

Closing thoughts

As we near the new millennium, I will close with two or three thoughts. First, I am impressed by the interest of young people in these systems. Many are here today. The human element is critical to agriculture. Sometimes we forget that. We must keep the swine industry "equal access", and have opportunities for young people to enter it.

Also, "Hoop structures are Y2K compliant." This statement shows not only the weakness of many systems, but also the inherent simple strength of the alternative systems. And a quote by a great philosopher of our time: "When you come to a fork in the road, take it," by Yogi Berra. Don't be afraid of change or risk, that's how new systems are developed.

Table 1. Hoop Initiative/"Hoop Group"

Jim Kliebenstein	Economics/Budgets
Mark Honeyman	Production Nutrition
Don Lay	Behavior
Jay Harmon	Environment
Tom Richard	Bedding/Manure
Brad Thacker	Health

An interdisciplinary team sponsored by the Leopold Center for Sustainable Agriculture.

Table 2. Performance of finishing pigs in hoops and confinement.

	Winter		Summer	
	Hoop	Conf	Hoop	Conf
Start Weight	101	97	36	38
End Weight	252	254	260	260
ADFI	6.03	5.94	5.34	5.39
ADG	1.53	1.60*	1.91	1.82*
F/G	3.95	3.72*	2.79	2.96*
Mortality %	3.0	1.5	2.0	4.5
Lights %	5.5	6.2	1.8	0.0

*P < .10

Table 3. Performance of two groups of finishing pigs in hoops and confinement averaged over 1 year.

	Hoop	Conf
ADFI	5.69	5.67
ADG	1.72	1.71
F/G	3.37	3.34
Mortality %	2.5	3.0
Lights %	3.7	3.1

(Data shown in Tables 2 through 5 were collected at the ISU Rhodes Research Farm. Two groups were fed, one in winter of 1997/98 and one in summer 1998.)

Table 4. Carcass scan data of pigs fed in hoops and confinement.

	Winter		Summer	
	Hoop	Conf	Hoop	Conf
Back fat, in.	1.16	1.14	.97	.86*
LEA, sq. in.	5.36	5.29	5.91	6.43*
Lean, %	47.3	47.3	50.2	52.8*
Lean gain/d	.50	.53	.66	.66
Eff. Lean gain	12.2	11.2*	7.2	7.4

*P < .10

Table 5. Carcass data of two groups of finishing pigs in hoops and confinement averaged over one year.

	Hoop	Conf
BF, in.	1.07	1.00
LEA, sq. in.	5.64	5.86
Lean %	48.8	50.1
Lean gain/d, lb.	.58	.60
Eff. Lean gain	9.7	9.3

Table 6. Farrowing phase results of a deep-bedded Swedish system in Iowa.

	Group ¹									
	A-1	B-1	A-2	B-2	A-3	B-3	A-4	B-4	A-5	Average
No. of litters	14	14	14	14	13	12	12	13	9	13
Farrowing rate, (%)	100	93	100	100	100	86	92	87	100	95
No. pigs born alive	149	136	168	143	162	142	156	129	109	144
No. pigs born alive/litter (ave.)	10.6	9.7	12.0	10.2	12.5	11.8	13.0	9.9	12.1	11.3
Ave. birth weight (lb)	3.5	4.0	3.8	4.5	3.9	4.1	3.7	4.1	3.8	3.9
No. pigs weaned	113	105	142	117	103	81	100	100	67	103
No. pigs weaned/litter (ave.)	8.1	7.5	10.1	8.4	7.9	6.8	8.3	7.7	7.4	8.1
Ave. weaning weight (lb)	17.4	18.2	26.7	26.7	23.4	23.0	23.0	27.5	19.6	22.8
Ave. age at weaning (days)	31.6	29.3	35.1	34.4	35.3	35.2	35.3	34.8	33.8	33.9
No. pigs weaned/born alive (%)	75.8	77.2	84.5	81.8	63.6	57.0	64.1	77.5	61.5	71.7
Farrowing interval (days) ²	13	7	5	7	6	5	4	9	7	7.6
Average Parity	1.0	1.0	2.0	2.0	3.0	3.0	4.0	2.4	2.7	2.3

¹Groups are denoted by letters and numbers. The letter (A or B) refers to the group of sows and the number refers to the farrowing.

²Farrowing interval = no. of days from first to last sow farrowing in the group.

(Data shown in Tables 6 through 8 were collected over two and one-half years at the ISU Armstrong Research Farm in Lewis.)

Table 7. Nursery phase performance of a deep-bedded Swedish system in Iowa.

	Group ¹									Average
	A-1	B-1	A-2	B-2	A-3	B-3	A-4	B-4	A-5	
No. pigs weaned	113	105	142	117	103	81	100	100	67	103
Ave. wean wt. (lb)	17.4	18.4	26.7	26.7	23.4	23.0	23.0	27.5	19.6	22.8
Ave. wean age (days)	32	29	35	34	35	35	35	35	34	34
Nursery duration (days)	29	27	26	27	28	26	23	22	27	26
Ave. selling age (days)	61	56	61	61	63	61	58	57	61	60
Ave. selling wt. (lb)	51	56	61	65	52	58	53	51	44	55
Ave. nursery ADG (lb/day)	1.14	1.39	1.29	1.36	1.14	1.31	1.30	1.03	.91	1.22

¹Groups are denoted by letters and numbers. The letter (A or B) refers to the group of sows and the number refers to the farrowing.

Table 8. Reproductive performance of a deep-bedded Swedish system in Iowa.

	Swedish Demo.	ISU Swine Ent. Records (top 1/3)
Litter/sow/year	2.35	1.92
Farrowing interval (days)	155	190
Pigs born/sow/year	26.4	19.1
Pigs weaned/sow/year	18.9	17.5

Swine Marketing Alternatives

Neil D. Hamilton

Neil D. Hamilton is Ellis and Nelle Levitt Distinguished Professor of Law and director of the Agricultural Law Center at Drake University Law School, Des Moines. One of the nation's leading authorities on agricultural law, Hamilton is past president of the American Agricultural Law Association and author of the book, *What Farmers Need to Know about Environmental Law*. He grew up on a farm near Lenox, Iowa, and raises shorthorn cattle in Adams County on a farm which has been in his family since 1872. Hamilton received his B.S. from Iowa State University and holds a law degree from the University of Iowa.

The focus of our conference today is on the issue of "alternatives" for producers, both in methods of production and in marketing. I have been asked to address the issue of marketing alternatives and will do so by examining three questions. The first is:

Why it is important to look for swine marketing alternatives? There are seven reasons you can identify for why producers should do so. These are:

First, it may create the ability to stay in production by obtaining higher prices for your pork. This is best illustrated through traditional forms of direct marketing, such as custom butchering and other forms of direct marketing. This may or may not involve special product traits concerning the pork being sold.

Second, it may provide you with the opportunity to market whatever special qualities or products you are able to pro-

duce, such as through the use of eco-labels, "value-added" specialty products, or unique quality or taste.

Third, an alternative may be your chance to produce pigs (and pork) in the manner you choose, i.e., finding support for how you want to farm. For example, some marketing alternatives may be premised on different production practices such as pasture farrowing, hoop house systems, seasonal production, or using organic methods.

Fourth, it will serve as an alternative to the more traditional forms of commodity marketing available to you, which are characterized as selling into a concentrated, surplus-driven market with limited price transparency and a growing belief that prices are controlled by packers and retailers

Fifth, it may provide an alternative to other forms of production or marketing ar-

rangements, all of which may reduce your autonomy or choices, and which may require you to be part of a network or a system to have market access. Marketing alternatives provide a way to be independent or to unite with like-minded producers rather than being a cog in a system in which you have little influence.

Sixth, alternative marketing creates an opportunity to communicate directly with consumers in the marketplace, both as to the quality of your food but also the financial impact of their purchasing decisions. Many alternatives involve personal contact and communication between producers and consumers.

Seventh, an alternative market may provide the opportunity to capitalize on or take advantage of the public's willingness to support "traditional family farmers" both in the marketplace and through public policy choices. In thinking about why someone will buy what you have to sell, the fact that *you* produced it can be a valuable trait. Currently, to the extent that such consumer or public concern or "good will" exists, it is either lost or captured by other entities in the marketing chain who most likely do not return any of this extra value to the actual producer.

The second question for us to consider is: *What obstacles will producers face in being more connected to the food system through alternative marketing?* There are at least seven obstacles or challenges you can identify in answering this question. The main challenge is how to turn a classic commodity-pork-into a product over

which you have more control and more marketing options. The whole production and marketing structure is premised on you producing pigs and them selling them at wholesale prices to someone else who will process and market the product. In many situations, the producer does not even own the pigs or make any of the actual marketing decisions any more.

A second obstacle is how that moving away from being the raw input supplier of pork will require taking on additional responsibilities and require other skills (e.g., marketing and processing) which producers may not have or may not be able to afford. The challenge may be "Can you do everything-both raise and market pork?" There are reasons why production and marketing system are diversified and specialized. To the extent that these additional functions or responsibilities have costs or risks, such as price fluctuation, you will need to absorb them. It is important to recognize that the part of the system you are in now has plenty of risks already.

Third, if you choose an alternative marketing system, you will be swimming against the tide of a food system which increasingly handles meat production, processing, and marketing in a concentrated and centralized industrial production model, e.g., fewer processors, branded marketing of standardized products, fewer local alternatives for processing, and arguably, less consumer appreciation for quality or variety. This means that at each step of the way—processing, product develop

ment and identification, and marketing—you may be operating in a system with limited resources available to help you, and in some situations many of the rules and processes set up against you.

A fourth obstacle is that the range of marketing options available is somewhat limited, especially in terms of scale and scope. Many forms of direct marketing are personalized or individual ventures and many are relatively small-scale. This does not mean that they are not important for the producers using them, but it may limit their overall significance in assisting large-scale marketing improvements either for an individual farm or for the sector.

A fifth challenge to alternative marketing is the need for producers and other institutions like the Department of Economic Development, Iowa State University, and the Iowa Pork Producers Association to support the development of alternative models which can allow more producers to have access to other marketing alternatives, especially at a scale of production which makes sense in today's swine systems.

Sixth, to the extent you succeed, you may be able to expect opposition or resistance from other people whose own businesses you may be affecting. For example, one limitation on the development of more local marketing is the availability of processing. The issue of the interstate sale of state-inspected meat is a factor in the availability of processing. This meat can now be sold only within the state where it is processed—even if the state plant meets

the federal equivalency standards. This issue has given rise to a suit by the State of Ohio against the U.S. Department of Agriculture and to proposals in Congress to change the limitation. There is a division of opinion over whether state inspected meat should move in interstate commerce, with some people concerned about health issues. At the same time, the federally inspected facilities enjoy not having to compete for sales with state plants, so there is an institutional bias toward larger facilities. As the recent price downturn demonstrated to producers - having fewer places to sell hogs or fewer options for marketing can be painful.

A seventh obstacle is that complying with various legal requirements concerning local processing and direct marketing of meat can be very confusing and sometimes costly.

These challenges do not mean that examples of effective alternative marketing programs do not exist. We are fortunate in Iowa to have two excellent examples, both of which will be presented today. These are Paul Willis of Thornton, Iowa and his work with Niman Ranch to sell high-quality pork products and the work of Vic Madsen and the Audubon County Family Farmers and their promotion of Hoop House Pork which we will eat today. Other examples are detailed in an article by Steve Marberry, "Niche markets buck commodity pork trend," in the Jan. 18, 1999, issue of *Feedstuffs*.

The third and final question to address is: *What are the keys to direct marketing success?*

By examining the examples of producers involved in alternative marketing, it is possible to identify several important points to consider in this regard.

The first lesson is the importance of identifying what is unique about what you have to sell, be it a product, a quality, a practice, or an image of the farm. Once the product is identified, then you can select the best method for communicating with possible customers and markets.

The second lesson is choosing something you like to do or for which you have a talent. There may be many different types of alternatives, but they may not be suited for you. So think about what it is you have and what it is you like to do. Growing things you like and finding people to buy them will be more fulfilling than fighting a system in which you do not feel you fit or are appreciated.

The third key step is focusing on merchandising rather than just marketing. Having a market doesn't mean you will profit, and while merchandising may not insure a profit, it lets you capture the value you have created.

A fourth lesson is the need to conduct market research so you know if there is a marketing opportunity before you make the plunge, and have an alternative market to tap if your market breaks down.

A fifth key to success is delivering a quality, consistent product. Being able to deliver what you have promised is essential to receiving the higher returns you desire.

A sixth lesson is the need to reach the right people, both consumers and decisions makers (e.g. buyers), with the message about your product, so you are talking to the ones who make the buying decisions.

If you have been successful in the previous steps this should help you satisfy the seventh key - developing repeat business so there is stability and predictability of demand and sales. This will let you expand the business or at least rely on the alternative.

These are some of the basic questions producers should consider when examining swine marketing alternatives. It is important to recognize that there are important opportunities developing for marketing high-quality pork products in various forms of direct or personalized ways. The new federal rule on "organic meat" will help standardize a national market and allow interstate sales, using a term increasingly familiar to consumers in the marketplace. The recent approval of "irradiation" as a food safety technique will also increase marketing opportunities for fresh pork among those consumers concerned about the safety of irradiation and the processing system which requires it. Finally, to end on a cautionary note, it is important to remember that if you are involved in making special claims about your product, you must comply with the federal meat inspection and labeling laws. You should be aware that in the last few years, the federal government has prosecuted several members of a South Dakota ranching family for making fraudulent claims about beef they were marketing.

A Farmer's Perspective

Vic Madsen

Vic Madsen farms near Audubon, Iowa. He, his wife Cindy, and one son live a mixed crop and livestock farm, which includes hoop structures for swine. Vic has been involved in several local development organizations and served as president of Practical Farmers of Iowa from 1992 to 1995.

Good morning.

You know the old saying about how if you are on a committee you don't want to miss a meeting or they will give you a job?

Well, I missed a meeting and here I am.

My job is to talk about making the decision to use an alternative pork production system.

First, to help prevent confusion, we should define the terms conventional and alternative production. To keep things simple, we'll say conventional pork production is a hog in a building on some type of a slat. Alternative pork production is everything else.

Now to the decision-making part. As many of you know, in February of 1999, a lot of Iowa pork producers are frustrated, angry, and uncertain about how they will fit into the future hog business. The business structure changes in our industry

combined with the winter prices have left some of us shell-shocked. We used to have a neighbor who if something really bad happened would say, "That's enough to make a preacher cuss." It fits.

It's also safe to say that when a person is stressed out, it is difficult to make a calm, logical decision. Therefore it is a good time to consider a decision-making aid or tool. The goal of the decision aid is to remove some of the noise and chaos, and to help sort through the choices. Many of the decision systems use a series of questions or tests to help sort out different options. The questions should include numbers from hard data and also include the goals of the people involved. For some reason, writing things down does make decisions easier.

So for the rest of my time we will use a decision making process to test the decision to use an alternative pork production sys-

tem. The three tests will be **profit, control, and fun.**

Well, how do conventional and alternative methods of pork production compare for profit? I don't know. We'll know more later on today, when we see the comparison trials. Right now, we can refer to things like this ag-engineering report on hoops that includes a finishing comparison. And we have reports from other farmers, plus our own experience. So if we are talking about finishing hogs, the profit per head is probably a wash. One system gains a little here, the other a little there.

But there is a Paul Harvey type, "rest of the story," to the profit test. Remember that when we sell a hog we are selling some of our capital and labor, as well as part of the corn crop. In general, conventional systems take more money and alternative systems take a little more labor. The source of the profit—capital or labor—therefore is different with the two systems. So the choice of systems may vary with your resources. For example, if you have some CDs in the bank, conventional methods may fit your situation. If you use hogs to help sell your labor or that of a family member or an employee, then an alternative system may fit best.

So if the answer to the profit test is a tie, we need to remember that we are selling more capital with the conventional system and selling more labor with the alternative systems.

The second test is control. This is a hard one because it brings out personality dif-

ferences and personal values. We won't all agree. There is nothing wrong with that. It means the decision aid process is working.

I'm going to go off on a tangent and then come back.

To finish hogs in 1999 in Iowa in a conventional system and to be economically competitive, we are looking at a double-curtain, total slat barn that holds about 1,000 head. It will cost about \$160 per head. To fill it and feed the hogs to market weight will take about \$90 per head. Adding \$160,000 for the building and \$90,000 for the hogs means that the ante, the cost to get in the finishing game, is a quarter of a million dollars with the conventional system.

To keep the dollars down we could consider a 400- or 500-head building, but the barn would cost at least \$50 per head more. The producer would be at an economic disadvantage before he started. It would be like playing poker with four cards when everyone else had five.

An alternative system is finishing 180 hogs in a 30 by 72 ft. hoop. The facility will cost about \$65 per head or about \$12,000 dollars. One hundred-eighty hogs at \$90.00 each adds about \$16,000 for a total of \$28,000.

We said in the profit test that the income per head was equal, so for a \$28,000 ante, the alternative producer can buy into the same game that costs \$250,000 for the conventional system.

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To keep the dollars down we could consider a 400- or 500-head building, but the barn would cost at least \$50 per head more. The producer would be at an economic disadvantage before he started. It would be like playing poker with four cards when everyone else had five.

An alternative system is finishing 180 hogs in a 30 by 72 ft. hoop. The facility will cost about \$65 per head or about \$12,000 dollars. One hundred-eighty hogs at \$90.00 each adds about \$16,000 for a total of \$28,000.

We said in the profit test that the income per head was equal, so for a \$28,000 ante, the alternative producer can buy into the same game that costs \$250,000 for the conventional system.

Now with that background, we can get back to the control test.

First, production control. When someone invests a large amount of money in a building that can only be used for hogs, the production choice is to keep it full and run wide open for 15 to 20 years. There is really no production control.

The lower first time cost of most alternative systems, combined with the possibility of multiple uses, gives a producer choices and more freedom to adjust to the times.

You have to give the production control test to alternative systems.

The other control test is financial control. This would include long-term balance sheet things as well as day-to day purchasing of inputs.

Back when we went off on the tangent and discussed building costs, I thought about adding the gestation and farrowing facilities required for the 1,000 head finisher or the hoop with 180 head. If you want to fill the finishers in a week to 10 days for disease control, you end up with between \$3,000,000 and \$4,000,000 for the conventional system versus \$30,000 to \$40,000 for the alternative system.

To get around the huge amounts of money required by today's conventional system, many different types of alliances and networks have evolved. These partnerships sound good at first but there are secondary effects. Pork producers have given up the

control of who they buy feed from, control of who they buy breeding stock from, and control of where they buy vaccines and medication. A store that is price competitive this year may not be in six months or a year or two from now.

As far as balance sheet type financial control goes, by tying up a large amount of money in hog facilities many producers have found themselves unable to do anything else when another opportunity came up a year or two later.

The financial control test then has to be a win for alternative systems.

Last, the fun test. I think we sometimes get so busy trying to make ends meet and get everything done that we forget about the people side. It's pretty well accepted that people who enjoy their work do a better job.

Two examples:

One of the Iowa State outlying research farms is the Armstrong Farm in southwest Iowa. A few years ago, they remodeled a hog house into a farrowing barn that uses straw, box pens, and group lactation. One end has a room with large windows for visitors. The first time I went to their field day, I got started watching the sows and pigs, lost track of time, and missed lunch. The second time I visited, I started watching the people as well. Almost everyone had a smile on their faces. They were enjoying themselves. It was a people-friendly environment.

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This winter, my 15-year-old son helped me put cornstalk bedding in a hoop with finishing hogs. He had been growling around in one of those moods teenagers get. We were done and as I was walking away, he started laughing out loud. I turned to see what he was laughing about. One of the pigs had picked up a corn cob, had it sideways in his mouth like a big old cigar, and was literally prancing around the building. If there ever was a show-off, that pig was it. That pig made chores fun for my son.

To be fair, the conventional side does have an advantage on really cold or windy, rainy days.

For the fun test though, I'm still going to go with the alternative system because I believe it offers a higher-quality work environment.

So what is the score on the decision test? Profit is a tie, with a star depending on whether you are selling capital or labor. Control of production and finances are wins for the alternative system. Fun is also a win for alternative systems.

I hope this little example gave you an idea of how a decision-making process works. Many of us farmers are probably better producers than decision makers, so learning about decision aids is time well spent.

Thank you and good luck.

Concurrent Sessions

Getting started with hoop structures

(Sessions 1A and 2A)

(Al Hoefling, Marcus; Dave Deyoe, Nevada; Fred Tilstra, Steen, MN, Archie Kunz, Brooklyn; Don Lewis, Washington; Don Struthers, Collins)

Denise Schwab – moderator

Joe Sellers - recorder

Composting hoop structure bedding/ manure (Sessions 1B and 3A)

(Tom Richard, ISU; Chauncey Jorgensen, ISU; Cory Weichman, Hubbard; Dan Wilson, Paullina)

Greg Brenneman - moderator

Kris Kohl - recorder

Marketing and value-added opportunities with alternative swine systems (Sessions 1C, 2C, 3B)

(Jan O'Donnell, Minnesota Food Association, Minneapolis, MN; Paul Willis, Thornton, Iowa; Danny Tollefson, Gaylord, MN; Rich Hall, Precision Beef Alliance; Cindy Madsen, Audubon; Gary Malenke, Sioux-Preme Packing, Sioux City)

Jeff Zacharakis-Jutz and Diane Mayerfeld – moderators

Mary Swalla Holmes - recorder

Decision-making: Identifying critical points and picking the system that is right for you (Sessions 1D and 3E)

(David Struthers, Collins; Homer Showman, Shellsburg; Wendell Williams, Milford; Steve Weis, Osage; Gary Johnson, Osco, Illinois; Bruce Williams, Villisca)

Paul Lasley and Clare Hinrichs – moderator

Larry McMullern - recorder

Using hoop structures for gestation or breeding barns (Sessions 1E)

(Danny Burns, Maryville, MO; Dean Ekstrom, Duncombe; Colin Wilson, Paullina)

Dennis Kent – moderator

Dennis DeWitt - recorder

Regulatory and other challenges to pork production (Session 2B)

(Bill Ehm, Iowa Environmental Protection Commission; Dave Pyburn, National Pork Producers Council; Helen Jensen, ISU)

Rick Robinson – moderator

Marty Schwager - recorder

Adapting existing structures to deep-bedded systems (Session 2D)

(Dan Meyer, ISU Extension; Jeff D. Hill, Algona)

Jay Harmon – moderator

Wally Greenlees - recorder

Outdoor Production Systems (Session 2E)

(Paul Brown, New Providence; Dave Odland, Clarion; Gary Johnson, Osco, Illinois)

Byron Leu – moderator

Russ Euken - recorder

Research and demonstration updates: ISU Rhodes Farm and PFI on-farm cooperator data (Sessions 2F and 3D)

(Mark Honeyman, ISU; Don Lay, ISU; Jim Kliebenstein, ISU; Mike Duffy, ISU; Larry Jedlicka, Solon; Paul Mugee, Sutherland)

Terry Steinhart – moderator

Dave Stender – recorder

Using hoop structures for early weaning and farrowing (Session 3C)

(Homer Showman, Shellsburg; Tom Frantzen, New Hampton; Jim Van Der Pol, Kirkhoven, MN)

Carl Neifert – moderator

Josh Sobaski - recorder

Getting Started with Hoop Structures (Session 1A)

PRODUCER PANEL: Dave Deyoe, Nevada; Al Hoefling, Marcus; and Fred Tilstra, Steen, Minnesota

MODERATOR: Denise Schwab, former ISU Extension livestock specialist, East Central Area

RECORDER: Joe Sellers, ISU Extension livestock specialist, Southeast Area

Dave Deyoe needed finishing space, and first considered hoop buildings he saw at an Iowa State Fair exhibit. He put in his first building in August 1994, and added another in 1995. He now has producer custom finishing pigs in three other buildings.

Among the *advantages*, hoop buildings:

- are inexpensive;
- are easy to start, and can be put up with your own labor;
- have many advantages over other outdoor systems;
- are definitely cheaper than confinement systems;
- require only one utility, the waterer;
- provide flexibility;
- produce less odor, and
- require little new equipment.

Among the *disadvantages*, hoop buildings:

- are more labor intensive;
- have higher bedding cost that negates some utility savings;
- result in lower feed efficiency compared to newer confinements;
- may have rodent and bird problems that are difficult to control;
- produce manure with inconsistent nutrient content, and
- require equipment that can handle dry manure.

Al Hoefling built three hoop buildings in November 1996 and the following summer. Last summer, he built three additional hoops. Their main advantage over a conventional confinement is the lower cost of building the facility (see his comparison costs below). He chose hoop buildings to limit his debt exposure. He has decided to finish in his own buildings rather than hire someone else to custom-finish.

Management is critical. Operators must manage the bedding. It takes him eight hours to clean out buildings and put manure in the compost pile. This is not the easiest way to raise pigs.

Cost comparison of hoops and concrete confinement

Concrete confinement	Hoops
Size of operation	
1,890 head	1,800 head
Initial cost	
Total	\$133,600
\$324,000	
Per head	\$70.69*
\$180	
Annual debt	\$26,000
\$61,183	
Annual cost	\$13.76/pig space
\$33.99/pig space	

* Per head cost would be \$84 if the cost of operator labor is taken into account.

Fred Tilstra has 12 hoop buildings. He first saw them at the Iowa Pork Congress in Des Moines and built his first hoop in 1991. He uses hoops for his swine operation, as well as a 600-ewe lamb flock, and for bale storage. He prefers hoops that are 30 ft. wide.

Normally, he has finished 300 pigs/year in hoops. He also uses hoops for gestation and feeds in crates. At present, he is cutting back on the number of sows in his operation.

QUESTIONS:

How do you handle bedding?

Hoefling tub grinds initial bedding in the buildings, and hires all big baling of bedding. Current bedding costs are \$.68/cwt of pork marketed.

Deyoe composts bedding and just puts it in a pile and leaves it there longer. He does not turn it but follows advice from Tom Richard (agricultural and biosystems engineering, Iowa State University).

What about farrowing in hoops?

None of the panelists farrow in hoops, but are interested in the idea. They believe added heat will be needed.

What about odor?

The speakers said odor should not be a concern if the hoops are managed properly

What about cleaning?

Deyoe tries to clean between each group. **Hoefling** and **Tilstra** do not always clean between groups, but when it seems to be needed. There may be an advantage to leave the manure pack for heat in cold weather.

Any problems?

All panelists have experienced dunging pattern problems in warm weather, when the concrete pad becomes particularly wet and messy. No panelist had worked with open ridge hoops, but producers in audience shared good results.

SUMMARY:

Deyoe: The main advantages of hoop buildings are their flexibility and economy. He built his first hoop without seeing one in use, and felt he was not risking too much.

Hoefling: Originally he thought the hoops were just a stepping stone to buy time until he could invest in finishing structure. Now he said he is sure this is how he wants to raise pigs. On bad weather days he does question this system. The hoops have been a learning experience for him; operators need to manage the system and watch the pigs.

Tilstra: Hoops require animal husbandry, not mechanics. You must walk the pens, get the pigs up and observe them. He said he would not be in the pig business if he had to invest in double-curtain finishing buildings.

Composting hoop structure bedding/manure* (Sessions 1B and 3A)

PRESENTERS: Tom Richard,** Department of Agricultural and Biosystems Engineering, ISU; Chauncey Jorgensen,** caretaker, ISU Rhodes Research Farm, Rhodes; Cory Weichman, producer, Hubbard; Dan Wilson, producer, Paullina

MODERATOR: Greg Brenneman, ISU Extension agricultural engineer, East Central Area

RECORDER: Kris Kohl, ISU Extension agricultural engineer, Northwest Area

Tom Richard has conducted composting research on ISU's Rhodes Research Farm using cornstalk-bedded manure from a finishing hoop. The manure is partially composted in the building. Manure inside the hooped structure varies in moisture content and nitrogen. The wet areas where pigs dung are high in nitrogen; dry areas are low in nitrogen.

Research has focused on several methods of building a compost pile. One method was to load the manure into a manure spreader and immediately unload it onto the ground. When the pile reached the top of the spreader, the spreader was pulled forward to form a windrow. This method breaks up chunks and mixes the manure. The other method was to remove manure with an end loader to form 6-ft. tall windrows, which is the method used by most farmers.

Richard used two turning schemes. In one scheme the windrow was turned whenever the core temperature reached 160°F. This required frequent turning, every day for two weeks. In the other scheme, manure was not turned.

The biggest challenge using this system to handle and compost manure is a signifi-

cant loss of nutrients. Half of the nitrogen is lost in the building and an additional 50 percent of the nitrogen can be lost during composting. Most of the potassium is lost in runoff water from the compost pile or leaching from the building. The good news is that all of the phosphorus in the manure is retained in the compost.

Nitrogen in manure is in its organic form, so much more manure must be applied during the first few years of use in a field (possibly two to 10 times as much, and at least four times as much), compared to nonorganic nitrogen. Organic nitrogen becomes available to plants within 10 years after it is applied.

Manure that is turned more frequently has a greater nitrogen loss than manure that is not turned. Richard found that spreader-built windrows had slightly more nitrogen loss than loader-built windrows. Much of the potassium was lost to the soil under the pile.

Richard listed two valuable aspects of composting manure:

- 1) Uniformity—manure is more uniform after composting, and
- 2) Reduction in moisture and volume—the final product has a 14 to 23 percent reduc-

tion in moisture and a 24 to 45 percent reduction in volume.

He added that concentration of nitrogen also takes place, despite a 35 percent loss in nitrogen when the compost is turned (mostly due to volatilization of ammonia into the atmosphere).

Chauncey Jorgensen, who manages the composting project on a daily basis at the Rhodes Research Farm, described the turning process. Compost piles are turned by scraping material from the outside and pushing it over the top. The middle part of the unturned pile is then scraped to the outside. The pile is pushed back to its original site to accommodate the nitrogen monitoring equipment, which is located underneath the pile.

Piles are turned when the internal temperature reaches 160° F, which occurred every day or two for three weeks. Piles were turned frequently.

For new bedding, six large round bales are spread out and left for the pigs to break apart and spread inside the hoop building. Bales are tipped every few days to make sure pigs are not crushed underneath them. Two bales are added each week, placed between wet and dry areas. Temperature readings inside the hoop show some composting is taking place in the dry areas where temperatures reach 110° F.

All compost going to the field is easy to spread and breaks up nicely with no large chunks.

Cory Weichman uses hoop buildings and discussed his method of composting manure. He piles manure outside the building, where it composts in much the

way that it does at the Rhodes Research Farm. He also composts his mortalities in the windrows and has been unable to find the carcasses when he hauls the composted manure to the field. Large sows may leave a grease spot after two to three months, but not much else.

He reports no problem with weeds after manure is composted, but he advised producers to keep weeds down near the composting area. He plans to continue composting and believes it is a good practice.

Dan Wilson uses hoop buildings and discussed his method of composting manure. He uses cornstalk and straw bedding, then composts the material similar to the way it has been composted at the Rhodes Research Farm.

He said that most of the time composting works well, but if the pile is turned too often, or is too wet, odor levels rise. He turns the pile about once every two weeks to a month.

Spreading manure on the field works better after it has been composted because stalks shatter. Cornstalks are tougher in raw manure, plus more chunks get in the field or wrap in the spreader. He plans to continue composting the material from his operation.

*This is a combination of two concurrent sessions on the same topic.

**Presenter at both concurrent sessions on this topic.

Marketing and value-added opportunities with alternative swine systems (Session 1C)

PRESENTERS: Jan O'Donnell, Minnesota Food Association, Minneapolis, Minnesota; Paul Willis, pork producer, Thornton

MODERATOR: Jeff Zacharakis-Jutz, ISU Extension communities specialist, East Central Area

RECORDER: Mary Swalla Holmes, Extension organizational specialist, ISU

Jan O'Donnell is the executive director of the Minnesota Food Association, a non-profit membership organization dedicated to forming a coalition of food producers and consumers to build a more sustainable food system.

She opened the session with examples of successful marketing cooperatives in Germany. As a participant in the "Marketing Sustainable Agriculture" European tour, O'Donnell had the opportunity to meet farmers involved in both processing and marketing cooperatives, such as members of a wheat cooperative who owned a bakery, several restaurants and a retail outlet. In Germany, market research shows that consumers buy regional labels more readily than labels that identify the product as "ecological" (equivalent to our "organic").

A German swine cooperative with a regional label is devoted to reviving an almost extinct land race. This old breed was developed in a particular region of Germany, and is now making a comeback due to a strong market demand. Processing is not as heavily regulated in Germany, due to a belief that quality can be maintained through market pressure.

She also discussed two alternative marketing programs, biomobiles and community supported agriculture (or CSAs).

Biomobiles are farmer-owned delivery trucks that go on established routes in residential areas to sell organic produce and meat. One CSA joined 23 farms in producing food for 600 households, with guaranteed weekly delivery of fruits and vegetables. All produce is grown biodynamically, a production system that was developed in Germany in the early 1900s. It is a distinct system, with specific preparations to build the soil.

Europe has many types of eco-labels; Germany alone has more than 30 different labels. Eco-labeling encompasses regional labels, animal welfare claims, production systems such as integrated production, organic and biodynamic labels, and "farmer's face" labels.

Paul Willis shared his experiences in developing a relationship with a West Coast company to market high-quality pork. Willis became aware of the California company, Niman Ranch, through a lamb producer. At the time, Niman Ranch was supplying premium cuts of meat to upscale restaurants in the San Francisco Bay area. Willis met with the owner after

he found out the company was looking for a pork supplier. The owner was impressed with the samples Willis supplied, and a deal was struck. Willis works with Sioux-Preme Packing, Sioux City, where loins are cut to order, for delivery to California every week.

Willis believes the customer base for his type of pork is not in Iowa or Japan, but urban centers on both coasts. His "free range" pork appeals to customers who are concerned with animal welfare and their own health. The meat is antibiotic-free, and the pigs spend most of the time in open pasture. As demand for Niman Ranch pork has grown, Willis has filled the need by developing a producer network. Producers must follow a strict protocol, and all meat goes through rigid quality control. Not every pig will meet the criteria, and some have to be pulled and sold through conventional markets. Just recently, Willis formed Niman Ranch Company of Iowa, which will buy the whole pig from the producer, process at Iowa

Pack in Des Moines, then ship to Niman Ranch in California for distribution.

The decision to distribute through the existing Niman Ranch label was made to capitalize on the long-term relationships that Niman Ranch has built in the industry. If Willis had chosen to start his own label, it would require a great deal of time and money to build a reputation. Willis is in the process of further developing protocol for production. His production system is based on the native, natural behavior of pigs, and has elements of the Swedish deep-bedded system. He has worked with the Humane Society to develop an endorsement from that organization for Niman Ranch meats.

Willis believes that listening to the customer is the most important thing a producer can do. Having an attitude that "the customer is always right" leads to market opportunities. The producer must find ways to get feedback from the consumer, and pay attention to their tastes and preferences.

Decision-making: Identifying Critical Points and Picking the System That's Right for You (Sessions 1D and 3E)

PRODUCER PANEL: David Struthers, Collins; Homer Showman, Shellsburg; Richard Thompson, Boone; Rex Thompson, Boone

MODERATOR: Paul Lasley, Department of Sociology, ISU

RECORDER: Larry McMullen, ISU Extension swine specialist, East Central Area

David Struthers is part of a family farm operation that involves his brother, sister, and their parents. They have a 900-sow farrow to finish system with some confinement buildings, but they are converting to a hoop building system. They chose hoop buildings because of the lower cost of construction and decreased environmental impact, and the fact that the hoops work well for them.

Currently, they maintain a multiple-site production system. They have 10 hoops (eight are 30 x 84 ft. and two are 30 x 54 ft.). The longer building houses 200 to 220 head. The shorter buildings are used as gestation facilities and/or sleeping units for finishing hogs (finishing hogs are allowed outside lots). All farrowing facilities are at one site (they use confinement crates for breeding and gestation), and confinement nurseries are at another site. The third site is used for finishing. They had considered using two 1,200-head confinement facilities to finish hogs, but chose the hoop system for environmental reasons.

Homer Showman started using the hoop system six years ago with three structures. He now has eight hoop buildings. He operates one confinement building as a nursery/grower facility. He chose hoop buildings for their low cost/low capital outlay and lower environmental impact

on the community (less odor).

His decision to use hoops also centered on the economics of hoop structures, namely, average daily gain and feed conversion of the pigs. After looking at hoops, he decided that the rate of gain was as good or better than confinement units. Feed conversion was questionable, but Showman has done on-farm tests with good results.

Other advantages of hoop buildings include the solid manure handling as well as the ability to compost manure in summer when there is limited on-ground disposal. He likes the composting aspect of hoops, which was an unexpected benefit. He also has used hoops as a wean-to-finish facility by placing 18-day-old pigs in hoops. This can be done every month of the year by using warm-hot compost material as the initial floor bedding, covered by about a foot of dry corn stalks. However, he still generally rears nursery pigs in confinement buildings during the winter months, then moves them into hoops. Odors are lower in hoop buildings than confinement buildings, so his employees enjoy working in hoops. Certain times of the year will generate dust in hoops, so they do wear masks. The facilities are easy to clean when the proper equipment is available.

Richard Thompson and his son, Rex,

have experienced many changes through the years. When Richard began farming in 1958, he said he caught the "enough is never enough" disease. He was always buying feeder pigs and cattle, putting in more pens, and cropping with continuous corn. All systems had high inputs! Livestock sickness was the rule, and good health the exception. Thompson used a lot of antibiotics with hogs.

In 1968, after what Richard calls several "spiritual experiences," he converted to a five-year crop rotation, a farrow-to-finish system, and a cow herd. He still used high amounts of antibiotics with sows and did not have an "all in/all out" system. When disease became a major problem, he quit raising hogs.

In 1978, he quit farrowing because the herd health problems did not respond to antibiotics. To combat the antibiotic residue problem, he started over with a Cargill unit to put pigs outside in fresh air and natural bedding. He raised Farmers Hybrid hogs because they could adapt to outdoor weather. Use of this genetic line helped develop current sales with Niman Ranch. Thompson continued with this system for 20 years.

By 1998, his swine unit had deteriorated. The buildings and fence line panels needed repair, and feeders were due for replacement. At this point the operation was transferred to his son. As a team, they made plans for the future.

Their decision for future direction of the hog unit was based on one question: "What is good and friendly for both humans and animals?"

They considered how they would contain diseases, and how they could farrow in

hoop structures. They decided to use outside production with hoops, and to remodel and repair some buildings. They replaced wire panels used as fence lines with concrete walls, making their own forms and doing all work themselves. Lime, which they used as a disinfectant, had been stored outside and became wet in the summer and froze in the winter. So they built a "lean-to" shed for lime and ground corncobs. The materials could be handled by tractor and loader instead of manual labor, and the lime stayed in useable condition.

They are in the process of replacing old farrowing isolets with home-designed A-frame sheds that are insulated for winter use within a hoop structure. They are still experimenting with the shed design, i.e., where to place doors, etc. They also replaced individual Smidley feeders, which had trouble with holes getting plugged, with stainless steel feeders. They currently use Solderhom rocking feeders for the finishing area.

QUESTIONS:

Are 75 cornstalk bales about right for each hoop building?

Showman said it depends on the weather conditions of the year and the quality of the bale. He makes about half or more of the bedding in the fall and the remainder in the spring. Spring bales may be in better condition to go into the summer and they are drier.

Any problems with pathogens, molds, etc, with spring bales?

Showman said he has never had any problems or reactions with any of his hogs.

Struthers also uses spring bales. They are fluffier, dirtier, and dustier, and they fall

apart more quickly than fall bales. He uses about three bales (30 x 84-inch bales rather than the standard 30 x 72-inch) per week in his 34 x 84-ft. hoop buildings. He bought a new Vermeer baler for processing corn stalk and soybean stubble for bedding. He needed to own the baler for timeliness and reliability of getting good quality bales. He bales all of the 800 crop acres, and gets bedding material from neighbors.

The Thompsons have had no problems with spring bales.

Any recommendation on the size and weight of the bale?

Struthers: The size of the bales should be as large as can be handled with equipment. Not as many bales need to be handled if they are bigger, and the bales surface water better in storage.

How do you move the bales into the hoop structure?

Showman uses a uni-loader with forks to bed the dunging area. He has had no problems driving into the hoop, but you can get stuck. He usually enters from the south end where the building has offset waterers and a raised 2-ft. concrete ramp. It is simple to place bedding and requires little labor. Typically, bedding is done with two people but one person can bed the facility with the aid of working the alleys.

Struthers also beds from the south end. He uses outside working alleys to position bales and keep pigs contained.

What do you use to sort and load out hogs from the hoop buildings?

Showman's buildings are in a row with outside alleys. He sorts and loads out of the facility in the center. He drives all pigs out of the hoop (this may take two to three

people the first time) and sorts in the alley.

Weighing is done in a load-out facility, which was designed by Dr. Temple Grandin (Colorado State University). This facility allows him to load out 200 head in about 20 minutes. Showman believes that hogs raised in hoops handle differently than hogs raised in confinement facilities. He encourages anyone with multiple buildings to consider such a facility for sorting and loading to reduce labor.

Struthers uses two to four people to run pigs into the working alley. Pigs are accustomed to going into the alley from the bedding process, and can load out very easily. He recently sold 120 head from one hoop using only four people with three 6-ft. panels to sort. Once pigs have been out to the alleys, they are very easy to move in again.

Do the Thompsons farrow in the isolets in January and February?

The Thompsons have been trying to get away from farrowing in the colder months, especially January, but it doesn't always work. Each isolet has a gas heater and heat bulb, which can be used when needed. They also are trying to design A-frame huts that use only heat lamps, which will reduce gas expenses.

July and August also are problem months. They have found it is much easier to cool in the summer than to heat in the winter.

The A-frame is constructed from 2 x 6-inch lumber with 5 1/2 inches of insulation placed within the walls. Isolets have 1/2 plywood and 1/2 foam insulation and are placed on a concrete pad that has no floor heat, just styrofoam insulation in the cement.

Isolets are cleaned once so sows must be trained to dung outside. No bedding is used in the isolets because of difficulty in cleaning. The A-frames are designed to use straw and be easily cleaned by tipping over or being lifted off the cement pad.

When baling corn stalks, are there any advantages for chopping versus using a V-rake?

Showman has done both and sees no difference. His hired help custom bales using a V-rake in front of the tractor and a chopper in front of the baler. This method sucks up more of the shucks, etc., although he doesn't know how it affects pig performance.

Struthers uses a chopper to get smaller pieces, which may be harder to bale. The smaller particles make corn stalks more absorbent. He uses a 20-ft. chopper with a V-rake behind it to make windrows. If he uses the chopper attachment on baler, he has to make more trips through the field, which adds to his time and labor.

The Thompsons are on ridge-till. They use an MC rotary Scythe, without the hoods, to make hay. Four corn rows go into each windrow for baling.

How much time does it take between groups to clean and re-bed the hoop building?

Showman said it depends on the equipment used. With large equipment, he has cleaned the building in four to five hours. Generally, three days is allowed to clean the building, wash down the cement, clean the feeders and waterers, and put in fresh bedding. Sometimes he uses lime, especially to fill holes and establish a deep-bed pack. The health of his hogs has been excellent.

Struthers uses lime as a base and to fill holes and to get a good hard pack established. To clean, he uses a 40-hp skid loader, although he has used a 140-hp cab tractor and loader. He does not wash anything down. His turnover time is usually about a day. When he re-populates with 40-50-lb. pigs coming from the nursery, the pigs are afraid of the bedding. Usually he must force them into the sleeping area, where he fences them off for a short time. Then the pigs can go to the feeder and waterers; otherwise, they will pile on the concrete.

McMullen (the recorder) suggested loading the pigs into the north end of the building. This allows the pigs to acclimate to the bedding, and they will work themselves to the south end where feeders and waterers are located.

What is the economic cost assigned to a bale of bedding and value of corn stalks? Showman would not sell bales for less than \$30 each because of the nutrients that have been removed from the soil. If he uses his own bales, he figures actual costs, which assumes a \$1/bale handling charge, the custom charge/bale, and the labor to put it into the building. The bale is then returned to the soil.

Struthers harvests bales from a neighbor in exchange for liquid manure from Struthers' farrowing and gestating facilities that can be applied back to the neighbor's field. Operators also must consider the extra cost of harvesting bales from highly erodible land (HEL), which may not produce as many bales. This also may create compliance problems.

The Thompsons have been keeping crop records and have assigned a value of \$50 per ton for corn stalks. The value recom-

mended by ISU is \$40 per ton, or approximately \$20 per bale.

(Asked of Showman) Are you pasture farrowing?

Showman does not pasture farrow pigs. He has done so in the past and weaned directly into hoops, but after two back surgeries he now buys only SEW pigs.

(Asked of Showman) Did you mention composting and using that material back in the hoops for little pigs?

Showman uses the compost material under the bedding in the nesting area for SEW pigs. He cleans the building and then uses a manure spreader to apply a row of compost in the building about three to four days before he stocks pigs. This compost material is about 140-160°F, which is covered with about a foot of sawdust or corn stalk bedding. This starter material generates heat. After the pigs have been in the building, he checks the bedding with a compost thermometer. Typically, the nesting area temperature

will be 120° at a 1-ft. depth, so there is heat. He also has a friend who uses a small portable Cargill-type building with heat lamps that he pulls into the hoop building.

Struthers said the key to making these buildings work is management. The question to ask: Do you want to flip switches, turn dials and invest high dollars to take care of pigs, or do you want to simply be out there with the pigs and help them to adjust to their environment?

Showman: "The neat thing about it is the pigs will make their environment."

What other materials besides straw and cornstalks will work for bedding? Showman suggested green sawdust, bean stubble straw, brome hay (which is very hard to clean), paper bedding (both glossy and newspaper, although newsprint is dusty), wood chips, and shredded crates.

Struthers said poor quality alfalfa hay also will work as bedding.

Using hoops structures for gestation or breeding barns (Session 1E)

PRODUCER PANEL: Dr. Danny Burns, Maryville, Missouri; Dean Ekstrom, Duncombe; Colin Wilson, Paullina

MODERATOR: Dennis Kent, agricultural specialist, Armstrong Research and Demonstration Farm, Lewis

RECORDER: Dennis DeWitt, ISU Extension livestock/beef specialist, Northwest Central Area

Dr. Danny Burns, who has operated a veterinary practice the past 23 years, also has been part of a farm partnership for 10 years. He and his partner now have about 650 sows, in addition to a row crop operation.

When he began his pork operation several years ago, he was looking for a low-cost way to get into the business. They decided to farrow hogs outside, and spent several days with a classmate in Cambridge, Illinois, learning about this type of operation. Eventually, they built gestation barns with 10 x 20-ft. dirt pens, with feeding done on concrete with a weigh station.

Two years ago when they were looking to expand, hooped buildings appeared to be a good option. They also had operated several hoop finisher buildings, so they knew some of the basics about hoop buildings. They decided upon a breeding structure hoop with white stripes in the center to let in lots of light. The buildings were erected as part of a producer research project of Sioux Steel, which manufactures hoops. Throughout the conversion they also used Pig Champ record-keeping to keep track of gestation, farrowing rates, straw usage and feed.

- Basic design

The hoop has a sleeping area on each end and a set of feeding stalls in the center, approximately 32.5 to 35 sq. ft. per sow. They are still trying to determine the optimum space per sow, which may be as much as 40 sq. ft.

- Feeding stalls or crates

Individual feeding stalls for each sow are essential to monitor feed consumption and reduce fighting or biting other pigs while they eat (usually the only time sows are aggressive). Generally, they feed one end and 30 minutes later come back to feed the other end. Sows are locked in the stalls while they eat.

"Observing pigs is very beneficial," Burns noted. "Some sows can eat five pounds in three gulps and the other time it takes one sow 20 minutes. We run eight purity sows and gilts in the same pen so you can't do it any other way."

How doors are closed depends on the producer. Burns said they close 18 to 20 pens with just one push. They also are experimenting with lights (to add the optimum amount of heat to the area) and three types of feeders. Feeding on concrete doesn't work because sows chase the feed everywhere but where they need

it. Troughs in which feed is poured requires sows to get on their knees to eat, which causes lesions.

- **Work alley**

They use an alley for access to the central feeding area. This alley also is used to move sows back to the breeding area. Sows are let into the feeding area in batches, which, surprisingly, is very orderly. Sows learn when it is their turn to eat.

His operation has four sizes of sows and probably four different kinds of parity of sows, which doesn't seem to make any difference in the feeding or handling routine (although gilts need some time to learn the routine). Each sow gets four pounds of feed, which is automatically delivered.

"If you watch, you'll see a sow run in and try and catch a bit of feed from one pen, then run somewhere else and catch a bit of feed," Burns explained. "If they get locked out once that will stop."

Sows also are vaccinated as needed when they are in the feeding crates.

- **Waterers**

This has been a big problem, even with help from Sioux Steel. They've moved the waterer four times in their building. It would do well in the corner by the back doors, but as bedding accumulates it gets deeper around the feeder.

Burns began building hoops for gestation in December, 1997. He now has three, which have been modified as they learn about them in different seasons. During the last part of gestation, they were feeding sows six, seven and eight pounds a day to make sure sows were at adequate

size and condition, but they have since cut back to a six-pound daily feeding during this period. He still figures a 25 to 30 percent savings over what they had been doing, but it depends on the type of feed.

- **Deep-bedding**

"This is fine," Burns said. "In the winter that's what my sow pens look like. In the summer you don't need very much, just enough to keep a dry spot for the sows to sleep. Bedding usage in summer is conservatively a fifth of what we use in winter."

As far as rutting, it doesn't take much for sows to rut a little bit. They get down and make their own little cool spot to sleep, plus sows are always in the shade in these buildings. The buildings he uses are 36 ft. wide and 180 ft. long, so there's always a draft or breeze running through them.

- **Doors**

He's experimenting with several kinds of doors. The main problem is getting proper ventilation. Some doors open all the way to the top, but he advised never closing the top arch. Other doors roll down from the top or up from the bottom, which can be difficult to roll because the tarp tears. Another type has plastic or metal pipes and bags that keep the door from flopping in the wind. He suggested using a door that is easy enough for workers to adjust and use. He also is looking at how different doors affect bedding use.

His favorite door has been a bi-fold type that has a tarp stretched over it. When you open it up you let air in from the side not from the bottom. The door is adjusted by cables that crank up from the bottom and lock into position with a chain. The door doesn't flop and it's lightweight.

"I have no problem with thermostats but I

don't think you need them," Burns said. "You can be there often enough, and if you're not, you need to be."

Doors also can be used to create shade, which pigs prefer. In the summer, he lets the doors down a bit to keep rain from running into the building.

- **Mortalities**

The best way to get rid of dead pigs is to use manure and bedding from inside the buildings as compost. "The recipe for this is dead pigs, the old 4020 John Deere, two buckets of compost and make a windrow," Burns explained. "That's it. We compost everything from baby pigs to sows. And you eventually haul off only a fourth of what you put there." He suggested a six-month composting time before the used bedding is ready to be hauled away.

Dean Ekstrom has a 90-sow farrow-to-finish operation in Webster County. He also was named a 1997 Master Pork Producer.

He built his first hooped building in 1997, which is used only for gestation. He chose a hoop because his other gestation building was falling down; the hoop was a more economical option than erecting a confinement building. He's found that sows are very comfortable and happy in the hoop building, too.

Compared to an open-front building (which Ekstrom has), the hoop building works well. Sows tend to pile on top of each other in the open-front building and he's had some problems. The hoop building also uses less bedding in the summer. He uses wood chips in the summer that he gets from a neighbor who does tree trimming; in the winter he uses cornstalk bales. The chips absorb better when they

are smaller, approximately 1.5 to 2 inches in size.

The east side of the hoop house has dividers down the middle to create 30 pens on each side. Cement at the front is used for feeding. He does not use gestation stalls, which seems to work well. He reports a conception rate of 90 percent or better.

He keeps groups of pigs together by age. When he brings boars in for breeding he does hand-mating, but no artificial breeding.

He spreads used bedding in the field. He's tried composting, but has a cement structure where he puts manure from his entire operation. He hauls manure from the structure only twice a year in the spring and fall.

His hoop building is a Coverall® system, although many companies now manufacture hoops. The cement pad is 72 ft. long and 32 ft. wide, which is about enough room for 30 sows to feed at one time.

Doors on the ends of the building have been a problem. His south door blew out during a 70 mph wind in the fall as they were trying to crank it up. They tried the same kind of door used in a tall confinement building but it doesn't go up and down. So they made the door permanent for the winter on the south side about two feet down from the top, which has worked well. The north side can be adjusted.

In January, the building froze although the bedding inside remained thawed. Pigs were very comfortable and did not pile like they did in his open-front buildings. The building has the benefit of using heat from the ground. He also is better able to vaccinate hogs in the pens during winter.

Moisture can form on the ceiling when not enough air passes through the building.

Colin Wilson has a 350-sow operation that combines pasture-farrowing with a Swedish-style farrowing and nursery operation.

They built only one hoop, which is used for breeding and gestation. The hoop is 87 ft. long and 37 ft. wide, with bedding down the middle and cement along both sides. It is used with their Swedish deep-bedded unit, which can be used with a group of gestating and breeding sows.

The building was designed for 48 sows. This number was determined by the size of groups coming from farrowing barns. Pens along one side are used for breeding and gestation, and sows also go there for weaning. Sows are bred in this area and stay there for the first half of gestation, when they are moved to a barn and concrete lot to make room for the next group.

A feeding slab for sows goes along the west side, although they are in the process of building individual feeding stalls. Within the past year they have not had any problems in feeding without stalls, but they would like to mix different parities so stalls will prevent fighting.

Bulk food bins are inside the building. When the feeding stalls are in place, they will use a feeding cart that goes down the alleyway on the west side of the building. A 9-ft. wide slab of cement along one side is used for floor feeding, where the feeding stalls eventually will be located.

Boar pens are located on cement along the east side of the building. One sow waterer

is at each end of the boar pens. Boar pens are in two sections: one in the back for sleeping, which has a solid fence to keep them warm in winter; and one in the front for feeding and dunging. The sleeping area behind the fence is 5.5 inches lower than the outside area to hold bedding in place.

"This works really well for breeding," Wilson said. "You put in the sows so when they come into heat the first place they go is in front of the boars. When it's time to breed all I do is go along and open the gate and let the sow in with the boar, they breed, and I let them back out."

Wilson has been working with Mike Duffy (agricultural economist and associate director at the Leopold Center) to record breeding time. He figures 20 minutes, but many times breeding is accomplished in 10-12 minutes.

"One of the big advantages of this building is the time it saves us, just in the handling of boars and sows," Wilson added. "Sows are calm and you don't have much trouble chasing them. I hand-mate everything in the pens, which usually can be done by one person."

This system runs about 30 ft. of bedded area per sow, which does not include the feeding area. Sow use of bedding is lower than expected. The first year they baled more bedding than they needed. They use grass hay (which sows love) and some straw. He advises careful use of poor quality hay because it can be hard to clean if not mixed with cornstalks. He uses a skid-steer loader and tine bucket for cleaning and hasn't had any problems.

Getting Started with Hoop Structures (Session 2A)

PRODUCER PANEL: Archie Kunz, Brooklyn; Don Lewis, Washington; Don Struthers, Collins

MODERATOR: Denise Schwab, former ISU Extension livestock specialist, East Central Area

RECORDER: Joe Sellers, ISU Extension livestock specialist, Southeast Area

Archie Kunz has six years of experience with hoops and has used all types of bedding. The style he uses has a concrete pad in the front, with beds in the back and a metal door. He said he thinks pigs are happy in hoops.

Ventilation can be one of the biggest problems. Hoops must be managed as cold housing, not like heated systems. Working facilities are critical. There also must be an adequate opening to keep moisture levels down. One person sorts pigs at market time.

Don Lewis built his first hoop in 1992 after seeing an article in a farm show magazine. He made several mistakes: 1) he built too close behind the structure, and 2) the split wall down the middle made bedding difficult. "Hoops need to be user-friendly. You need to make it work in all conditions."

Bedding must be kept up, or problems with smell will result. Bedding also must be kept up in the summer to keep animals off the hot manure pack. Bedding also must be kept dry, so good drainage on the site also is needed. Birds can be a problem. He's very excited about using hoops for early weaned pigs.

Don Struthers said his decision to build hoops included his sons and other partners. They first considered hoops for hay storage. They felt they could succeed with hoops if the Rhodes research farm was successful.

Their first project included four hoops; now they have 13. "There are a lot of different ways to raise pigs."

QUESTIONS:

Any tips on construction?

- To cut costs use cheaper materials.
- Panelists do not recommend using more concrete than needed.
- Most people prefer wooden walls; panelists would not choose concrete.
- It's a good idea to have an inner gating system to improve pig flow, make sorting easier.
- Storage or covers for bedding may be helpful because dry bedding is important.

What about taxes and insurance?

- Most insurance companies now understand hoop buildings and provide coverage.
- Hoops are included on property taxes.

SUMMARY:

Lewis: Set up your system so it is usable

for you. Sometimes you will get frustrated. You must be able to adjust to varying weather conditions. Timing of weather conditions and manure hauling also can be a problem. Bedding is important

Kunz: Make your system user-friendly. Having a door system in the back can

make bedding easier. Keep ventilation a priority.

Struthers: Determine your goals and see if hoops fit. Be sure hoops are what you want and then you can make it work. Hoops are flexible, simple and adaptable.

Regulatory and Other Challenges to Pork Production (Session 2B)

PRESENTERS: Bill Ehm, Environmental Protection Commission; Dave Pyburn, National Pork Producers Council; Helen Jensen, Center for Agricultural and Rural Development (CARD), ISU

MODERATOR: Rick Robinson, Iowa Farm Bureau

RECORDER: Marty Schwager, Iowa Pork Producers Association

Bill Ehm, as chair of the Iowa Environmental Protection Commission, oversees environmental rules that are enforced by the Iowa Department of Natural Resources. Also a poultry producer, he works for Crestland Coop. He compared the pork industry to the poultry industry, which had left the state but now is returning with a different look. The pork industry may be going through similar changes.

Livestock manure should be the responsibility of the company that owns the hogs, as well as individual growers. The future of the pork industry impacts independent producers in several ways:

1. Independent producers will need stricter nutrient management plans. More specifically, they may need to manage manure by its phosphorus content, rather than just nitrogen. If this occurs, producers will be spending more time and money to apply manure, especially in areas where the soil already is high in phosphorus.

2. Independent producers also must deal with the environmental impacts of manure from natural causes. One example would be when a heavy rain causes runoff from an outside feedlot, or causes a manure storage facility to overflow.

3. Independent producers must consider all areas where the industry is changing—

economics, marketing, as well as environmental considerations. He said the commission is making changes as they fit into the system, but they do not promote sociological change or economic development. Decisions are based on sound science and what is good for the environment.

Dave Pyburn said one of the biggest issues facing the pork industry today is food safety. What makes it difficult is that the industry must deal with more than just reality, but consumer perceptions about food safety. Already, all meat processing plants with more than 10 employees must have a Hazard Analysis Critical Control Point (HACCP) food safety system. Plants must address hazards in microbial, physical, and chemical forms.

Pork producers can follow good production practices by using the Pork Quality Assurance program (PQA). This program addresses anti-microbial residues and physical hazards, and brings more efficient management to the farm. The NPPC is urging all packers to require PQA Level III product so that food safety problems can be addressed before they occur.

Other food safety programs in the future may be similar to ISO 9000. One program under consideration would assure trichina-free pork. Pyburn said trichina has

been virtually eliminated, although consumer perception is that it still exists. In 1998, there were 24 reported cases of trichina in humans. In most years over half of the cases are related to something other than pork. A 1995 report shows that only 0.013 percent of swine had trichina.

One on-farm audit looked at production practices to determine where trichina and other potential food safety issues could be controlled. One site had a hoop structure to study rodent control. It was determined that even if the structure was infested with rodents, they could be controlled. Inspection by a herd veterinarian must verify the infestation was under control, and the information could be passed on another agency for certification.

The ultimate benefit is for the consumer. Pyburn said food safety must be looked at as a continuum, from the producer to the end user. Programs like PQA and on-farm trichina certification programs would allow independent producers to be competitive with integrated producer systems.

Economist **Helen Jensen** presented information about two types of regulations, and the potential for new regulations.

1. HACCP regulations at packing plants
This has been successful. Almost 9 percent of the carcasses at the plants were testing positive for the presence of salmonella bacteria before implementation of HACCP. With 83 percent of the plants meeting HACCP requirements, only 6.2 percent of the carcasses were positive.

What is the cost for HACCP? On average, associated costs for increased levels of food safety rose by 1 to 2 percent. The percentage of total plant operation costs

was lower for larger plants, and higher for smaller plants.

2. Antibiotic regulations

Antibiotics have two purposes—subtherapeutic for growth enhancement, and therapeutic for control of diseases. New proposals from the Food and Drug Administration (FDA) regulate antibiotic use in two ways. First, any new antibiotic cannot develop resistance. This would be determined by developing a baseline, and antibiotics could be ranked according to how they develop resistance and their risk of use.

Second, antibiotics used in animals should not impact human health. Sweden has a voluntary ban on low-dose use of antibiotics. Denmark has followed suit with a voluntary ban on growth enhancements in 1997, and in September of 1998 introduced a ban on all growth enhancements. The question is how this ban affects pork exports.

Discussion in the United States about similar regulations has been underway for some time, but we're not sure of the consumer response. Research has looked at the use of antibiotics in large vs. small operations. A group will be going to Sweden and Denmark to determine what effects, if any, the ban has had on health and economics.

3. Future regulations

These will be based on science and may be linked to the ability to trace antibiotic use in animals, as well as animal welfare considerations.

QUESTIONS:

Why don't municipalities have to follow same regulations required of livestock

producers for the disposal of waste products?

Municipalities have a license for discharge.

What is the driving force behind regulation of antibiotics?

The biggest concerns are for their effects on human health and development of antibiotic resistance.

Marketing and value-added opportunities with alternative swine systems (Session 2C)

PRESENTERS: Rich Hall, Precision Beef Alliance, Lewis; Danny Tollefson, pork producer and marketer, Gaylord, Minn.

MODERATOR: Diane Mayerfeld, ISU Extension agronomy program specialist, ISU

RECORDER: Mary Swalla Holmes, ISU Extension organizational specialist, ISU

Rich Hall, president of the four-year-old Precision Beef Alliance, said efforts actually began in 1991 when a group of beef producers met to discuss ways to improve their herds. Five producers wanted to create an opportunity for success in the cattle markets. They could see they would have to change, and they wanted to change toward success.

Precision Beef Alliance was formed in 1995 to help mid- to small-sized producers remain competitive. The goal was to enhance profitability of each operation. Precision Beef Alliance helps producers learn how to develop and retain value in high quality markets. This is done mainly by building an information feedback loop from the processor to the producer. Every animal has an individual identification number, and that stays with the animal to the carcass level.

The system relies on a good relationship with the packer. Iowa Beef Packer records carcass data on individual carcasses and reports it to each producer member. Hall estimates that this activity alone has put \$1 million into the pockets of the member producers in the form of additional premiums.

When the Alliance was first set up, producer members did not request premiums

from the processor. Instead, they asked to be given a chance to prove that they could deliver a superior carcass. Then they showed that the additional data collected for each carcass also could benefit the processor. Hall believes that information will be the biggest source of adding value in the future. Certain markets need more information, such as some Japan markets that want non-confinement and certain genetics. Hemoglobin made from cow blood can bring up to \$120 per cow, but extensive records must be kept throughout production and processing. Hall reminded the audience that the best education they can get is from the consumer. It is important for farmers to tell their story, but they also need to listen carefully to the consumer.

Precision Beef Alliance now has more than 600 members in nine states. It is very costly to build producer supply networks. They take lots of time, energy and dollars, but Hall believes they are one way to maintain market access for small and medium producers.

Danny Tollefson is a pork producer from Minnesota who developed an outstanding lean pork product through his feeding program. He had some trouble working with his processor to get the finished

product, so when he had the opportunity to buy a USDA-inspected plant, he did.

Tollefson put together a producers cooperative that used his feeding program to achieve the lean product. Soon he was processing 50 hogs per week, selling his product in five Sam's Club stores. The problem was that the business was losing money and as corners began to be cut to save money, his product became more of a commodity. That led to more problems, until he was losing \$40,000 a week.

Packaged pork is a very competitive business and there are problems in moving the entire hog. Premium cuts are easy to sell, but there is more to market. Tollefson found that ham, loin and bacon are easiest to move, and that it's best to make sausage from the rest. Eventually, he left his own company.

Tollefson now sells 16 hogs a week, and has developed a good niche for his product. He learned some lessons during his first venture that he shared with the audience.

- Customers have definite ideas about what they want.

Tollefson discovered that people are very interested in humane treatment of animals when doing his own product demonstrations at Sam's Club stores. It dispels the idea that the customer will eat whatever you put in front of them.

- Customers really like a quality product. This may be a difficult thing to do, but

customers really like it. Tollefson said federal legislation that allows state-inspected processors to sell across state boundaries would help. Not many plants are federally inspected, and there are not enough inspectors.

- If you sell a high quality, consistent product, price is not an issue.

Tollefson said he believes there is a place for small producers and family farms, but only if they can find ways to get to niche markets. He now sells to Wedge Food Co-op in Minneapolis, an organic food cooperative. His meat is simply labeled as "Tollefson Pork." It helps that he processes 40 miles from the Twin Cities, a big market for his type of product.

He also uses farmers markets as "dump markets," selling mostly sausage. He sells some cuts fresh, some frozen. He feels that frozen is really a better product, because it is really fresher. The frozen is packaged in Cryo-vac, so no air gets to it.

Tollefson spent about \$20,000 for market research, and feels that his product has elevated pork to the next level. It is consistent, lean, with high polyunsaturates, and the flavor and color that consumers prefer. Currently, he is growing all of his own hogs, but feels that he could put together a network again fairly easily. For now, he prefers the lifestyle and freedom that comes with producing and marketing for a smaller niche. And he's making money instead of losing it.

Adapting Existing Structures to Deep-bedded Systems (Session 2D)

PRESENTERS: Dan Meyer, ISU Extension agricultural engineer, Northeast Area; Jeff D. Hill, Murphy Family Farms, Algona

MODERATOR: Jay Harmon, extension agricultural engineer, ISU

RECORDER: Wally Greenlees, ISU Extension agricultural engineer, Central Area

Dan Meyer: The problem with renovating old tall barns or machinery sheds into swine structures is that there is too much air volume. It costs too much to heat that much air. These situations usually result in a high mortality rate because pigs suffocate from piling to keep themselves warm.

That problem can be solved by creating an artificial "hay loft" that acts as a lower false ceiling. This false ceiling entrains the heat at animals' level. The resulting warm area encourages pigs to make their sleeping area under the loft and dung outside the sleeping area.

Artificial hay lofts or false ceilings can be made from 2x6 lumber on 4-ft. centers that support a wire mesh hog panel fence. The fence then supports a 4-inch thick layer of straw that holds heat but lets moisture pass through it. Instead of 2x6 lumber, wooden poles on 8-ft. centers also have been used by one producer. Buildings converted in this way can be operated in very cold outdoor temperatures.

At the entrance to the area covered by the loft, provide a curtain made from woven poly-tarp or plywood. This curtain also traps heat and encourages pigs to sleep under the loft. More details about this construction are available from an ISU Extension fact sheet, Improving Winter

Environments in Open-ceiling Buildings for Pigs, Pm-1760, October 1998.

Other considerations:

- Place the artificial hay loft approximately 7 ft. above the floor to allow for cleaning by skid steer loaders. The loft should cover a sleeping area that has at least 5 square ft. per finishing pig, or 10 square ft. of sleeping area per sow. Use plenty of bedding and bed only the sleeping area. The outside walls should be insulated, if possible.
- Pour concrete floors at a slope of 1/4-in. per ft. so that urine waste can be removed.
- Costs are about \$11/pig for construction of a false ceiling and gating. This cost includes the cost of gating. The slide photograph example that Meyer provided during the session included feeding equipment. The feeding equipment cost the producer in the example an additional \$14 per pig.
- For ventilation, remember that air currents tend to move from east to west in a building. The size of the ridge vent in a barn roof should be 5 square inches per pig, or about a 2-inch ridge width for every 10 ft. of building width.

For supplemental ventilation on buildings

up to 28 ft. deep, use 1600 cfm fans on the ends of 12-inch diameter PVC pipe. The pipe acts as a duct. Place pipes on 32-ft. centers. On the pipe itself, provide 3-inch diameter holes on 12-inch centers. Allow 15 cfm per pig. For ventilation on buildings up to 48 ft. deep, use 2400 cfm fans on the ends of 15-inch diameter pipes. Refer to ISU Extension fact sheet, Supplemental Ventilation on Modified Open Front Finishers, Pm-1761, for more details.

- Reducing temperature to about 65° F for larger pigs can control ammonia levels. As a goal, keep ammonia below 25 ppm.

Jeff Hill discussed how turkey barns and shallow-pit, pull-plug liquid manure confinement systems can be renovated for use with deep-bedded swine production.

In 1996, Murphy Family Farms had 2,300 head in buildings that had been renovated for deep-bedded swine production. In 1998, the company renovated additional buildings to achieve a 20,000-head capacity in deep bedding. Renovated buildings range from 250 to 700 ft. long.

Two turns per year are scheduled in renovated buildings. The turns are scheduled so they do not interfere with crop planting or harvest seasons. The capacity is based on 15-16 sq. ft. per finishing pig because it's easier to manage bedding, which is added about once a week.

All renovated buildings use a single pen design. It is not uncommon to have 600 to 2,000 head in a one-pen building. Buildings are cleaned only once every two turns, or about once per year. The average manure pack depth at cleanout is 22 in.

Hill suggested that existing feed delivery systems should be used, if possible. On

Murphy Farms facilities, tandem bins are used, although they have gone to wet/dry feeders in deep-bed facilities. The feeders are mounted on floating platforms made from 2-inch solid native Iowa oak planks that can be raised as more bedding is brought in. Feed tubes above feeders adjust to accommodate the variable platform height.

To control heat and humidity in the summer, Murphy Farms uses an automatic misting/cooling system. Systems are set to run 1 minute every 10 minutes. For supplemental heat in the winter for young pigs, Murphy Farms uses the existing brooder heaters installed in the turkey buildings.

A 4-ft. controlled curtain provides supplemental ventilation, with circulation fans used to only stir and mix air. Side walls in the buildings are replaced with solid native Iowa oak boards or planks that extend 30 inches above the floor and support wire hog panels. The curtains hang above the hog panels.

Most of the turkey facilities used for deep bedding are pole barns. Pole barn posts should be wrapped in tin to prevent the pigs from chewing on them.

The company allocated \$15 per pig space for renovation, but the actual cost ranges from \$8 to \$16.25.

Hill offered these tips for operation of renovated buildings for deep-bedded systems:

- If the building has a dirt floor, use a lime base pack underneath the bedding.
- Start with a clean building and 14 inches of fresh bedding. Bales can be left intact in a row down the center of the building to

encourage pig socialization.

- There is no need to exceed 22 inches of loose bedding. Pigs seem to stop burrowing after they've gone 6 to 8 inches deep, provided they have not found anything "new" to burrow into.
- Expect to use approximately 200 lb. of corn stalk bedding per pig. About 100 acres of corn is needed to produce enough bedding. (Note: The speaker did not say how many pigs this applied to. However, it is the recorder's best estimate that 100 acres should supply enough bedding for 2,000 pigs assuming 2 tons of cornstalks are harvested per acre. The amount of cornstalks harvested from any given acre depends on the residue requirements for soil conservation compliance.)
- If there is enough room, [recorder assumes room for burrowing], pigs should be able to be placed in building at 50° F. (Note: The speaker did not clearly specify whether he meant "room" for burrowing or "room" as in square feet of area per pig.)
- Allocate 60 percent of total space as a lying area and 25 percent as a dunging area. The dunging area can be kept along the sidewall by strategically placing heaters over the bedded space, and a misting system over the scrap alley. Maintain bedding pack all year long.
- For animal handling, use a portable load-out tub with a double-holding pen capacity. The sort pen should be no wider than 8 ft. With this system, Murphy Farms usually can load a semi-truck in less than 45 minutes. The record time to load a 180-pig truck was 22 minutes. Also with this loading system, trim loss and bruising has gone down.

- Pigs can be vaccinated as they come in off the truck count. Murphy Farms can do 2,000 pigs this way in just under 2 hours.

According to Hill, these systems have had generally excellent animal performance. They have not yet broken 2.0 on rate of daily gain, but that's a goal. Hill said Murphy's feed conversion for deep-bedded pigs in renovated buildings has been competitive to slightly better than their confinement pigs. Feed for deep-bedded pigs can have a lower energy ration.

Bedding management is the key to deep-bedding systems. Bedding must be added weekly, and managers must have a bedding plan. Straw bedding can be used, as well as some shredded newspaper; each has advantages and disadvantages.

Hill suggested that 6 to 8 inches of fresh bedding should be placed on top of the previous turn's bedding before the second turn of pigs is added to the building. To prevent problems with rats in the bedding, keep the feeding area clean and stockpile bedding at least 50 ft. away from the building. The average N-P-K analysis is 20-20-20 for manure that comes from Murphy Farm's deep-bedding systems.

The advantages of renovating a building for deep-bedding systems include:

- the use of an existing resource,
- reduced environmental concerns
- possible improved public perception, and
- happy pigs.

Deep-bedding systems are a low-cost alternative. Herdsmanship is still very important! Don't try to make it a cheap system. Use good gating and load-out systems.

Outdoor Production Systems (Session 2E)

PRODUCER PANEL: Paul Brown, New Providence; Gary Johnson, Osco, Illinois; Dave Odland, Clarion

MODERATOR: Byron Leu, ISU Extension livestock swine specialist, Southeast Area

RECORDER: Russ Euken, ISU Extension livestock specialist, North Central Area

Paul Brown started pasture farrowing in 1991. Before that he had worked for his father-in-law who pasture farrowed 500 gilts, and Brown also had worked for a 500-sow confinement operation. From these experiences, he decided what he wanted to do.

Three reasons to pasture farrow:

1. It's profitable. He said he never lost money until 1998.
2. It's enjoyable. He likes working outside in June when most of farrowing occurs.
3. The family can work together. "Farming is in the middle between a business and a way of life."

The big advantage to pasture farrowing versus other systems is flexibility. Disadvantages include predator losses and losses to extremes in weather.

Ways that he believes pasture farrowing is similar to other producers system:

- You can use artificial insemination, and
- He uses terminal boars and purchases gilts.

Brown has been using a Heston stack processor to build piles of bedding that he puts farrowing huts on top of. This practice has helped during wet conditions.

Gary Johnson focused on management of a pasture farrowing system. He follows a pasture farrowing calendar (he provided a printed copy). Nothing has changed except for some minor adjustments. However, if he doesn't follow it closely, he can have a disaster.

Johnson uses a batch system, farrowing the same group twice a year. This system would fit well with hoop finishing. He now uses early weaning so the calendar as printed should show an additional 21 days before breeding for fall farrowing. Early weaning fits very well with pasture farrowing.

He is considering a custom breeding program that would use artificial insemination. All females would be synchronized and then a custom breeding service would do the AI.

Johnson tries to keep his system all-in/all-out with grow-to-finish pigs by using empty barns and sheds in the area. The only disadvantage for pasture farrowing is the high labor needed during a short period of time. He figures one person is needed for every 100 gilts when they farrow.

For **Dave Odland**, pasture farrowing is the conventional system. He farrows two sets

of gilts each year. Although the number varies, typically he has 150 in first group and 100 to 150 in the second group that farrows in late July and August.

For a May 25 farrowing date, he starts breeding sows around Groundhog Day. By the end of May he is usually done planting and typically children are out of school, so it is a family-friendly system.

Odland said he doesn't get hung up on numbers but tries to expose enough sows so that 150 to 200 head are bred. He tries to take advantage of their gain between December and July because the sale of sows is a big part of his income. Sow sales help spread out income and he can take advantage of the situation tax-wise.

He usually markets 1,000-2,000 hogs each year. His system is flexible depending on market

Pasture farrowing is a low-input system. They try to use what they have for building huts, such as lumber from old barns. They also try to build huts that are easy to construct.

Oats are planted in late winter and spring so that it can be used for bedding after harvest. Beans are planted on the oat ground.

Odland said he believes that high grain prices more detrimental to his income than a low hog market. In the 1980s, his hog operation had an average annual income of \$60,000 after taxes, compared to \$30,000 in the 1990s.

QUESTIONS:

How much preweaning mortality do you have and how have you tried to prevent it?

Johnson: It is high. He has used a bale processor to make a pile of bedding for the farrowing huts to sit on top of. The sows don't seem to paw in the bedding as much after it has been through the processor because it is shredded more. Sometimes Johnson said he will make piles in October and November so that the bedding will settle by spring farrowing. Gilts will not use the shed if it is too full of bedding, but that does not seem to bother sows.

Odland: He has what would be considered extremely high preweaning mortality, close to 20 percent. If he farrows 9, then he'll wean 7 to 7.5 pigs. If he farrows 10, then he'll wean 8 to 8.5 pigs. He has tried early weaning but most of his losses occurred in first two to three days. The difference is in the genetics of the sows and their mothering ability. He has found that a 6 x 8 ft. house works best. "You have to have the mentality that if you have a big rain and you lose six or eight litters in one night, that is part of this low-cost system."

Brown: He has about 8 to 12 percent mortality. Using processed cornstalks helps cut mortality, and so does using a 6 x 8 ft. hut. If the A-frame is bigger, sows or gilts tend to double-up inside. He has tried some of the English-style huts, which are excellent in the spring because they can be closed for greater protection from the weather. However, they are more expensive than other huts.

Is pasture farrowing increasing or decreasing in your area?

Odland: Two or three people in his county have quit pasture farrowing. Economics in general and market access is a problem.

Johnson: Due to the inconsistent supply of market hogs, market access has been a big concern.

Can you market gilts that have farrowed at a market hog price?

Odland: We, breed them again because they will gain better and then sell. Usually go by the calendar: wean them by July 5 and sell by August 5.

What kind of pasture do you use and how does it fit into your rotation?

Odland: He has 15 acres that are rotated: oats, then pasture for three years (for a total of four years out of crop production), and then soybeans the first two years that it's back in production. It might be nine years before it goes back into pasture. He has three separate areas/pens in the pasture that are used during the three weeks of farrowing. He allows one week farrowing in one pen, then moves pigs that have not farrowed to another pen for a for the second week.

How do you move them?

Odland: The ones that haven't farrowed are ready to go.

Do you clip needle teeth?

Odland: He doesn't clip teeth but he does give iron shots.

Why give iron shots?

Johnson: With bedding in the huts, pigs don't have contact with soil.

Brown: He uses a hog cart to process pigs.

Is there a difference between sows and gilts in baby pig survival?

Johnson: Sows are better. Sows wean 20 percent more pigs.

Brown: There's a difference of 1.5 pigs between the two—sows are better

Odland: Sows are accustomed to a routine. If there is something different, sows will get excited.

Does using the same cart to process all pigs spread disease?

Brown: We've thought about that but we haven't seen a problem. He uses litterguard for sows.

Do you ring sows?

Odland: Yes or your pasture will be plowed. He uses two humane rings on top of the nose. There is a technique to doing it, however. The ring needs to lay right on the nose with not much of ring above the nose.

Why is there so much pasture farrowing in Henry County, Illinois?

Johnson: The region has rolling terrain and topography. It's also custom and tradition, people are comfortable doing it. Climate has a lot to do with it, too.

Why would anyone pasture farrow in Wright County where drainage is poor and typography is flat?

Odland: The 80 acres they use is well tiled. They do have another farm that would be better suited because it is better drained, but it is farther away from base and finishing floors.

Are market hogs fatter than average (when pasture farrowed)?

Odland: I'm sure they are. We've had trouble using lean genetics in breeding facilities during years that are cold.

Johnson: If pigs would grow slower they would be leaner. Fast growth and leanness are contradictory.

What kinds of rations are fed between farrowing and market?

Brown: We feed seven different rations. Just because pigs are raised like they were in the 1950s doesn't mean they have to be fed like they were during the 1950s. He has increased the number of rations due to

weaning at three to four weeks instead of six or seven weeks.

Johnson: With good milking sows, you can wean earlier and most of rations are fed before pigs are in the 80 lb. range. He feeds about the same number of rations as Brown.

How/where do you finish pigs?

Brown: We don't finish pigs on pasture, they will tear it up. We move pigs inside at 150 lb. He uses a shed that once was a bunker silo with a roof over it.

Odland: He finishes on concrete and has room for 2,000 head.

Johnson: He finishes in hoops that he constructed with a canvas cover on top of a pit silo.

What is your feeding system?

Odland: During breeding and gestation, animals are fed on concrete. The second group of gilts are fed on pasture after they

have rings in. They are fed on dirt, but he has wood platforms to use when it's muddy.

How do you deal with heat in summer?

Johnson: He uses 1,000 gallons of water to fill up mudholes. He is concerned about keeping sows cool, not as much about pig survival. He does this early in the morning before sows get hot.

Johnson: He does the same thing when it gets very hot. He also has used plastic pipe with sprinklers, which seems to help him avoid creating mudholes.

OTHER COMMENTS:

Someone in the audience said he used Jenny donkeys for predator control, also electric wire and llamas. Only one guard animal is needed for each pen.

Another audience member said he has used concrete pools to avoid heat stress and alleviate mudhole problems.

Research and demonstration updates: ISU Rhodes Research Farm and PFI on-farm cooperator data (Sessions 2F and 3D)

PRESENTERS: Mark Honeyman, coordinator, Research and Demonstration Farms, ISU; Don Lay, Department of Animal Science, ISU; Larry Jedlicka, producer and Practical Farmers of Iowa member, Solon; Paul Mugge, producer and Practical Farmers of Iowa member, Sutherland; Jim Kliebenstein, Department of Agricultural Economics, ISU; Mike Duffy, Department of Agricultural Economics, ISU

MODERATOR: Terry Steinhart, ISU Extension swine specialist, East Central Area

RECORDER: Dave Stender, ISU Extension swine specialist, Southwest Area

A recently completed study compared the economic return of hooped buildings versus conventional facilities. Factors considered included pig growth rate, feed efficiency, developing growth function, distribution of growth, production costs and returns, and rate of return on investment.

The bottom line is quite similar between confinement and hoop systems. The decision about which system to use is a management choice, and can be based on the availability of labor versus capital resources.

One comparison was conducted at the Rhodes Research Farm, where there are three hooped structures and one confinement facility. The research has involved animal scientists, veterinarians, economists and ag engineers. They looked at the environment, animal health and behavior, variability, how pigs were moved, and other factors. In one group of summer pigs, hoops had slightly superior feed efficiency in summer, but poorer in the winter.

Labor efficiency: Time spent per pig in

confinement, 0.21 hours; compared to time spent per pig in hooped facility, 0.27 hours.

Cost: The largest differences in cost were in capital, bedding and feed expenses. Pigs raised in hoops required less capital but bedding and feed expenses were more.

Consumer willingness to pay for pork: Jim Kliebenstein reported on a study that showed consumer willingness to pay for pork produced in an "environmentally-friendly" manner. His research showed that two of every three participants in the study were willing to pay between 8 percent and 22 percent more for pork, respectively, depending on the level of environmental stewardship for odor and water quality.

Pig mortality: Mark Honeyman said the Rhodes study showed different death losses in summer and winter. In winter, hoops had a pig mortality rate of 3 percent, compared to 1.5 percent for confinement system. In summer, hoops had a pig mortality rate of 2 percent, compared to 4.5 percent for pigs in confinement.

Pig performance: Jay Harmon said pigs in the trial came from the same source, and were medium lean gain pigs. Results showed that pigs raised in hoops were 2.5 percent less lean in the summer, which could have resulted from the differences in housing or in nutrition. All pigs were scanned and lean gain per day was computed. Slaughter data showed a 1 percent difference in lean gain.

Members of the audience asked about the accuracy of the measurement and formula used to calculate lean gain percentage. Early-weaned pigs also seemed to be doing fine in hoops during cold weather, except they might have a problem making the transition from fall to winter weather. Pigs usually sleep in a certain area, but as the weather changes, the nesting area wasn't large enough.

Animal behavior: Don Lay reported results of his study to see if pigs in hoops experience the same amount of stress. He found the biggest differences were related to bedding and the size of the group.

Pigs raised in hoops are limited in the number of resources such as feeders and waterers. Groups of pigs would tend to get up together and fight at the feeder and waterer. There also was fighting during hot weather, or when one pig walked over another pig to lay down. In general, however, pigs raised in hoops fought less than pigs raised in a confinement facility because hoop pigs have activities to occupy their time. Pigs in confinement rested more than pigs in hoops, and when not resting they were observed fighting, chewing on ears, nosing bellies, biting tails and manipulating other pigs. Pigs raised in hoops were observed in more play behavior.

Lay said future research will evaluate pig stress and immune response differences. He said he also wanted to look at feeding alternatives, drinking space allocation, and effects on group dynamics. The research unit can replicate a barren pen, which is the primary cause of pig stress. The current study uses 8 sq. ft. of space per pig in confinement, versus 12 sq. ft. per pig in a hoop facility.

Practical Farmers of Iowa (PFI) demonstrations: Mike Duffy reported by PFI cooperators have logged data on labor spent in hoop facilities. For 12 hoops, producers spent an average of 0.272 hours per pig; for 12 hoops, producers spent an average of 0.29 hours per pig. In one hoop used for breeding and gestation, average labor per sow was 1.3 hours.

Duffy said the data was sorted by the type of bedding used and type of time spent (to check bedding, feeding, sorting, and veterinary/medical care). Data was consistent with producers throughout the state. Data also was consistent when divided by the type of task that was done.

The overall labor efficiency for pigs in confinement is 0.21, compared to 0.27 for pigs in hoops. Some producers, however, may consider the quality of labor, higher in hoop structures than for confinement facilities.

Other comparisons: PFI cooperators said bedding costs are variable, depending on whether the bedding is purchased or produced on the farm. The mortality rate also seems to be affected by bedding. They had not been able to determine any differences in percent lean and yield, but found they could load out hogs from a hoop facility much easier than from a confinement facility. PFI cooperators said they

have fed pigs in hoops the same way they did in confinement, but that hoop pigs tended to grow faster. Some cooperators said they feed more fiber to hoop pigs to slow down growth.

One producer has kept records on three 30 x 84 ft. hoops. His records showed that he spent 7.02 minutes per hoop per day on labor for cleaning.

Paul Mugge, who has a hoop operation with another producer, reported an average daily gain of 1.5 to 1.7 for pigs and F/E of 3.3 to 3.6. He found death loss to be very low, and that pigs in hoops are more

uniform than they are in outside feeding. He starts with six inches of corn cobs in the hoop, which has worked well. Pigs come out of a SEW nursery, and he had 0.2 hr. labor per pig.

QUESTIONS:

What about leaching under the hoops? Is there research that addresses this potential problem?

Usually the dirt is not muddy under a hoop building. The ground is packed under the bedding, so leaching is not a problem.

Mugge summarized his data in the table on the following page.

Producer data on hoops operations

<u>Dates</u>	<u>Pen # started</u>	<u>Initial Avg. Wt.</u>	<u>current Facility</u>	<u>Pen Days</u>	<u>Avg. Wt</u>	<u>Avg. total days to 230 lbs</u>	<u>Test Pd. Days</u>	<u>Avg. Days Fed to Market</u>	<u>ADG</u>	<u>Feed (AF) to Gain</u>	
12/15/97-05/12/98	hoop-12/87	169	51.8	hoop #1	21992	247	185	149	127	1.55	3.46
12/15/97-05/11/98	barn-12/97	193	50.9	home-n shed	26700	250.2	184	148	131	1.54	3.35
04/06/98-08/31/98	toms-4/98	373	46.8	toms	49185	249.8	183	148	130	1.57	3.34
05/04/98-09/28/98	hoop-5/98	169	52.2	hoop #1	23413	257.3	182	148	133	1.54	3.24
05/04/98-09/29/98	barn-5/98	223	55	home-n-shed	30989	256.7	180	149	130	1.57	3.14
		225.4	51.34		30455.8	252.2	182.8	148.4	130.2	1.554	3.306

<u># started</u>	<u># Mark eted</u>	<u>Sort Loss</u>	<u>Avg. B.F.</u>	<u>Avg. Lean</u>	<u>Avg. Yield</u>	<u>Feed/cw t.gain</u>	<u>Nonfeed /cwt.gai</u>	<u>Fixed/ n cwt. Gain</u>		
12/15/97-05/12/98	hoop-12/87	169	164	-0.14	0.92	51.4	74.86	20.51	1.58	25.34
12/15/97-05/11/98	barn-12/97	193	189	1.02	0.74	53.9		19.19	1.84	1.57
04/06/98-08/31/98	toms-4/98	373	365	0.86	0.9	50.9		18.71	5.51	0
05/04/98-09/28/98	hoop-5/98	169	167	-1.88	0.74	54.1		18.72	1.57	2.59
05/04/98-09/29/98	barn-5/98	223	207	-1.27	1.01	50.4		18.96	1.93	1.43
		225.4	218.4	-0.282	0.862	52.14	74.86	19.218		

Marketing and value-added opportunities with alternative swine systems (Session 3B)

PRESENTERS: Cindy Madsen, producer, Audubon County Family Farms, Audubon;
Gary Malenke, Sioux-Preme Packing, Sioux City

MODERATOR: Jeff Zacharakis-Jutz, ISU Extension community development specialist,
East Central Area

RECORDER: Mary Swalla Holmes, ISU Extension organizational specialist, ISU

Cindy Madsen is a member of Audubon County Family Farms, a group of producers who believe in healthy farms raising healthy families. They work together to market their products directly to the consumer. Four producers use hooped structures in their hog production, two sell chickens and eggs, one has antibiotic-free beef, as well as other products. All have very diverse, sustainable farming systems. It helps to have a state-inspected small processor available 20 miles from Audubon.

When Audubon County Family Farms started, a lot of time was spent learning the rules, labeling requirements, and legal aspects of direct marketing meat. The group now has a coordinator, Donna Bauer, who has spent quite a lot of time researching these issues. The group's strategy is to take orders for meat at farmers' markets in the Des Moines area. The products can be sent throughout the state using dry ice.

Marketing keys include offering samples and recipes, which always increase sales. One of Audubon County Family Farms' most successful promotions was the sale of Christmas boxes. This really increases income for the year. The group also hosted

a festival in August for their urban customers. Customers are invited to visit the farms where their products are raised, and this has been a successful way to strengthen relationships. One unsuccessful strategy was to set up an 800 number for customer calls. In the four months it was in use, only one customer used the toll-free number. Audubon County Family Farms customers are happy to use their own dime to call about questions or orders.

Audubon County Family Farms has developed their own label for hoops-raised pork. They established it as a trademark by sending a description to the Iowa Secretary of State. This label must be used under "distributed by" in addition to the packer's label.

Many farmers' markets have different requirements for food safety restrictions. It is best to establish a good relationship with each farmer's market coordinator, so that producers understand rules that relate to the sale of their products at each particular market. On the farm, freezers used for Audubon County Family Farm products are inspected once a year by the state inspector. Producers are allowed to use their family freezer for products, but a

partition must separate the meat that is for sale.

Madsen feels that direct marketing of meat can be successful, but other groups of small, sustainable farmers should try to find more "experts" to help them in their efforts. She suggested a person who would work to acquire labeling for these types of products, and another person who could address food safety for small farming and marketing operations.

Gary Malenke of Sioux-Preme Packing shared insights from the packer's perspective. His company's primary business had used mostly frozen carcasses until they began working with Farmland Foods and started to custom cut their own hogs in early 1997. In a constantly changing business, he said Sioux-Preme had trouble establishing an identity in a very competitive primal cuts market. One strategy has been to focus on lighter weight pigs, which work well for food service. To differentiate themselves, they went to customers not being served by the mainstream packers.

Malenke said Sioux-Preme is always looking for niches where they can fit. Organic meat is a growing market, along with natural meats, and will become more clearly defined in the future. Sioux-Preme

is involved in the Berkshire Gold program developed for the Japanese market, and he sees it as a viable program for small producers. Sioux-Preme currently offers a custom kill, custom cut program. They charge \$10-15 to kill and the cut is more depending on specifications. While the custom kill/cut currently accounts for only 10 percent of their business, they would like to expand it to around 50 percent.

People who work in niche markets must know exactly what the customer wants, which is sometimes a moving target. Sioux-Preme sees niche markets continuing to grow as grocers and retailers also look for ways to differentiate themselves from mass marketers. He believes exports to Japan are just getting started, and although work needs to be done, there will be opportunities in the future. One thing that would help in niche markets is a better definition for "quality" that goes beyond the "organic" and "natural" labels. Malenke said he would like to see a "pull through" program that is pulled by customer demand, not pushed by production. He urged the audience to call into the USDA Marketing News Reporting Service, which sets the base price according to surveys of packers. The number is 1-800-687-7410.

Using hoops structures for early weaning and farrowing (Session 3C)

PRODUCER PANEL: Tom Frantzen, New Hampton; Homer Showman, Shellsburg; Jim Van Der Pol, Kirkhoven, Minnesota

MODERATOR: Carl Neifert, ISU Extension livestock swine specialist, Central Area

RECORDER: Josh Sobaski, ISU Extension swine specialist, Southeast Area

Tom Frantzen is a farrow-to-finish swine producer from northeast Iowa. He has three 30 x 72-ft. "Cover All" hoops. He first learned about hoop house farrowing two years ago on an ISU tour, and began farrowing in hoops in March and April, 1998. Most of his hogs had been pasture-farrowed, something he has done for 25 years, then finished inside the hoop facilities. During the colder months, December and January, he farrows in a controlled temperature facility.

For farrowing inside hoops, Frantzen built his own 80 x 80-inch Illinois-style huts at a cost of about \$200 each (46 sq. ft. total). Each hut requires four sheets of treated plywood, at a cost of about \$125, then he cuts his own dimensional wood. He has placed 24 huts in each hoop, although it is quite congested in a 30-ft. wide hoop, and he probably will not use that many huts inside a hoop again.

Other key points:

- Frantzen prefers "roll down" doors on the huts, but does not like to lock corners very tightly.
- He averages 7 to 8.5 weaned pigs per sow. The key to minimizing death loss is keeping piglets inside the hut when they are first born.
- He recommends a hot bedding pack for

additional floor heat.

- Finished hogs are loaded out through a "Grandin" sorting chute designed by Temple Grandin, which allows him to load out about 40 hogs in 5 minutes. He has been really pleased with this load-out facility.
- In between farrowing, he cleans hoop houses with a tine bucket loader.

Jim Van Der Pol and his son Josh have a farrow-to-finish swine operation in western Minnesota where they raise a Duroc-Berkshire cross sold in specialty markets. They decided to use hoops to get the most return out of a low capital investment (hoops). Before they built the hoop facilities, they had decided to quit work in traditional hog confinement facilities.

They built their first Biotech hoop two years ago with the intent to farrow once and finish twice in this facility. They built a second hoop, a "Cover All" structure, about six months later.

Under their current system, they pasture farrow females in September in individual huts that are placed inside a hooped structure. When pigs are two weeks old, the huts are removed and pigs are allowed to move freely inside the hoop. They remain inside the hoop for winter feeding, and

when pigs are sold in March, the facility is cleaned so that it can be used for farrowing again.

They use Porta Huts for farrowing (manufactured in Storm Lake) that are 4.5 ft. wide and 7.5 ft. long, and cost about \$100 each. Huts are aligned in two rows of 11 huts that face each other down the center of the hoop, where there is a 15 ft. open space. They have had problems with bossy sows in this alignment, and may switch the configuration to solve it.

In 1996, they used only 21 Porta Huts in each hoop. Recently they have been using 24 Porta Huts, which gets to be crowded, so they might put four huts at the end of each hoop structure to give them more space.

They feel the economics of using hooped facilities in this manner have been excellent. Van Der Pol said it was "the best day of my life" when he started pasture farrowing. Quality of life has become a big part of his swine operation. He also said he won't produce pigs unless another person is involved in the operation.

Other key points:

- They average 9 weaned pigs per litter.
- Females must be managed closely to get good results. This includes using nose rings, especially for pasture farrowing.
- The goal is to farrow all sows within 7 days of one another. They also want all sows in huts when they farrow.

QUESTIONS:

When do you farrow in the hoop house?
The third week of March. He also tried to farrow in November but did not have good results.

When are you done farrowing?

Although it's new for them, they try to keep the farrowing within a seven-day period.

Homer Showman has a wean-to-finish operation, which includes eight hooped structures and a nine-year-old grow-to-finish confinement facility. He began using hoops five years ago, when he built three 30 x 72 ft. hoops with a 16-ft. concrete pad on the south end. In the past, he had done pasture and confinement farrowing, but does not farrow pigs at the current time. His last three hooped structures were built on a concrete pad 2 ft. above the dirt pad.

He began putting weaned pigs in hooped structures several years ago when he ran into a schedule problem. He found that he lost only two pigs out of 400 head, so he decided weaning pigs in hoops would work, even in the summer.

He got first group of pigs in March when the outside temperature was 15 degrees below zero. After that experience, he went to a "hover system" in which curtain material is stretched 30 ft. across the building, and bales are stacked 10 ft. high in the back by the main door. For his next group of weaned pigs, he used small corn stalk bales stacked two bales high with 2 x 4 lumber placed across the width of the door and covered with small corn stalk bales.

He bought infrared heaters to warm an area inside the building but he has never used them. He also started to use hot sawdust as a warm bedding pack but was concerned about "bugs." Now he uses compost from his own bedding to create a 10 x 20-ft. warm area for baby pigs.

Other key points:

- He hand-feeds pigs on the floor when

they first arrive, and troughs are used for water.

- Lids are tied up on waterers.
- Temperatures in the inside "hover" area

in January are about 120° F.

- He never puts pigs in hoop buildings during extremely cold weather. In January and February, all new pigs go into confinement facilities.

- Feeder pigs required three sorts to sell an entire group, but his wean-to-finish system requires only two sorts. The first sort takes about 75 to 80 percent of the group. The next sort takes all but about three or four head.

- Feed efficiency in his wean-to-finish operation is 2.6 to 2.7, and rate of gain ranges from 1.3 to 1.6 lb./day depending on genetics and health.

QUESTIONS:

Do you feed the same rations to your confinement hogs and your hoop hogs?
Yes, two-stage pellets, then grind and mix.

Do you have any trouble getting babies off the concrete and into the hover area?
No, pigs are forced into the hover area using a hog panel that is attached to the edge of the hover area against the cement for feeding.

How long do you leave hover area?
About two to three weeks.

How high do you stack the bales?
Two bales high, or about three feet.

Is piling a problem for pigs?
No.

Decision-making: Identifying Critical Points and Picking the System That's Right for You (Session 3E)

PRODUCER PANEL: Gary Johnson, Osco, Illinois; Steve Weis, Osage; Bruce Williams, Villisca

MODERATOR: Clare Hinrichs, Department of Sociology, ISU

RECORDER: Larry McMullen, ISU Extension swine specialist, East Central Area

Each panelist discussed his operation and gave some decision-making factors used to develop the current operation.

Gary Johnson pasture farrows in Henry County Illinois. He had wondered whether pasture farrowing was antiquated, or whether it was a production method that could be exploited.

"After hearing the morning program, pasture farrowing may not be as old-fashioned as I thought," he told the audience. "Maybe I am on the "cutting edge of technology."

Johnson said he felt pasture farrowing matched technology for several reasons. First, he batch-farrows so that he has a large group of pigs, an all in/all out system. If he wanted to early-wean and pair up with someone else, he would have a system large enough to work. Five years ago he did not have the technology or nutritional knowledge to do batch-farrowing, which is one technology that allows him to survive in the business.

Always on the lookout for new technology, Johnson said he became interested in a custom artificial insemination service. Since he has 150 to 200 sows, he could hire a technician to synchronize heat periods and breed the sows at one time. Johnson

said he has mixed feeling about the number of empty swine buildings in his neighborhood, but another possibility is to put weekly groups of pigs on different farms to keep his all in/all out system in operation.

There are several negative aspects of batch-farrowing in a pasture system. One is marketing, which is seasonal in the spring and fall. Traditionally, this is a season of low market prices, but he has decided not to deviate from these farrowings. He said he has tried to farrow at other times of the year and it has not always worked. Most of the time, higher market prices do not offset the lower number of pigs produced in those off-months.

Another concern in a network system is packer access. This is getting to be more of a problem as time passes. He might not have a problem with a half semi-truck load, but it can be troublesome when he has only 20 or 30 hogs to sell. He has not pursued joining a marketing cooperative at this time, but it may be the answer in the future.

Labor availability also is a negative aspect. Pasture farrowing is very labor intensive during a short period of time, and it's difficult to find help, especially in

an area with a declining rural population. Getting help from family members has only a narrow window, possibly from 12 years of age through high school, which is only a short period in the scheme of things. Johnson said he has had to consider the available labor supply and pay competitive wages to attract and maintain people to meet his labor needs. He said he also might consider networking or integrating with other individuals.

"Someone asked in this morning's session, 'How can I become a part of the food chain?', which was something I had never considered," Johnson told the audience. "I have always looked at raising hogs as an independent producer and doing everything my way. I am finding that is probably not a very healthy attitude.

"As an independent producer, I thought I could buck the trend, but I am seeing in my county some changing trends in the hog industry. It has humbled me to say, 'How can I maintain as much independence but yet stay competitive in the hog industry?' I don't think I can do it alone. I must tie into the strengths of others to remain competitive. Again I just want to be a part of the food chain."

QUESTION:

Have you considered using a hoop to farrow year-round?

Johnson: He currently farrows twice a year, in the spring and fall, and does not want to expand because he doesn't have enough gestation facilities. Also with leaner genetics, he said he wants to keep sows in smaller groups to keep sow condition uniform and allow him time to concentrate on his breeding herd. He does not want to use off-site gestation facilities; sows are high-maintenance and require time and observations. But to maintain

packer access with lean carcasses, Johnson said he periodically buys gilts to get a "jump" in leanness, but would appreciate hearing other people's experience in marketing small numbers.

Weis: He has not had any problems with market access, and has been able to sell only 10 to 30 hogs at a time.

Williams: He works with a marketing group, Niman Ranch, that sells pork to California restaurant chains and grocery stores.

Steve Weis farms with his father and two brothers. They have an average diversified farm with hogs, veal calves, corn, soybeans, oats, and hay. Their swine herd consists of 200 sows and they use a variety of buildings. For gestation, farrowing and nursery/grower pigs, they use a confinement building. For finishing, they use outdoor lots, open-front barns, hooped structures, and a confined double-curtain finisher.

In 1993, they built the confined finisher for \$200 per pig space. At the time, confinement finishing seemed like the only option. When hog prices fell in 1994, Weis said he started to think about the future and the direction the hog industry was taking. When they lost the rental of a barn and open-lot facility in 1996, they decided to construct three hooped buildings. They were 30 x 72-ft. BioTech, structures that each held 150 to 180 pigs. The cost of construction was \$60 to \$75 per pig space.

He listed the following concerns and issues that he considered when they decided to change from confined finishing to the hooped structure finishing

- Is it right for your farm and right for you personally?

- Economics: Where is the hog industry heading?

Weis received a grant from the U.S. Department of Agriculture's Sustainable Agriculture, Research and Education (SARE) to compare confined production to hoop production. He found that hoops are economically viable. The average daily gain is comparable, if not better, in hoops; feed efficiency was the same in the summer but worse in the winter. For them, the backfat and yield was the same for pigs in the hoops and confinement buildings.

- Do you need the flexibility of hooped structures?

This goes back to the question: What is the direction of the hog industry for the small- to mid-size producer? Hooped buildings can be used for other purposes such as hay storage and different kinds of livestock. Hoops are versatile and low in price, which makes them low-risk structures.

- What direction are you heading?

The pork industry is shifting in two directions: toward industrialized pork complexes that use large confinement buildings, and toward "alternative pork" that includes production in deep-bedded facilities, organic or natural pork, and niche marketing with a quality product. Weis said he found in slaughter checks that hogs in hooped building were healthier and there were fewer air quality problems. One negative aspect of hoops might be worm infestation, which can be controlled. As the industry grows, taste will be a more important factor. Weis said people tell him that pigs raised in confinement taste different than pigs raised in hoops.

- What are your management abilities?

Weis said operators must like hogs and enjoy working with them. A confinement production system takes different skills and there is less contact with pigs; hoops requires a higher degree of hands-on pig husbandry (checking, bedding, etc., on a daily basis).

- What is the weather? If weather is a concern, it is easier to raise pigs in confinement.

- What happens at market time?

Weis said it may be more difficult to get pigs out of the hoops than out of a confinement facility. This might be managed by occasionally allowing the pigs to go out in an alley. Pigs are naturally curious and will respond to handling.

- What about bedding?

This was a big question for the Weis operation because they use ridge-till cultivation. He said they wondered how they would get the large volume of bedding needed for hoops. But if this system works on ridge-till for them, Weis said it will work for anyone. Because a large volume of bedding is required, they make it a high priority to get bales made in the fall. They also look at several sources for bedding materials. Operators also must consider how they will handle the bales. In their operation, they have used both small bales and large round bales.

- How will you handle manure?

Weis said they were already set up to handle dry solid manure. This must be considered because it should be done in an environmentally sound manner. The large volume of bedding equates to large volumes of manure and operators must know how they will handle it. Weis said that in their operation there was a lot of pressure to spread directly to the field at all times

and under all conditions, but they are now looking at composting the manure and have been working with Tom Richard at Iowa State University. Composting decreases manure volume by 1/3 to 1/2. Manure varies within the hoop from very dry to very wet, which becomes more uniform after composting. Composting also stabilizes nutrients in the manure.

- What are your other concerns?

Weis said they were concerned about the back curtain on the north end as being a weak "link" in the system. They also are concerned about the longevity of the tarp and whether it will last for 15 years. He is concerned which effects longevity more: wind or direct sunlight?

To summarize, Weis offered these observations:

- The opportunities in hogs may not be in conventional markets and methods of raising hogs.
- Keep an open mind.
- Fit the system to the farm and the resources.
- Consider the economics and flexibility of hoops.
- Management skills must be geared to hooped buildings.

QUESTION:

How do you handle processing cornstalk bales on ridge-till?

Weis said he chops the stalks on the ridges in the fall, then rakes them. The baler wheels are spaced to fit the rows, and baler pick-up tines are modified to fill the ridges. It is almost impossible to pick up as much stalk material in a ridge-till field as in a flat field, but this leaves more ground cover. Bales are picked up eight at a time with a mechanical pick-up machine. When doing this, the ridges cannot be

crossed; the machinery must follow the ridges.

Bruce Williams is a fifth-generation pork producer from southwest Iowa. He began raising hogs when he was 10 years old and his father gave him a sow. Profits from hogs he raised put Williams through Iowa State University.

Williams has farmed since he graduated from college in 1978. He was in partnership with his father until 1990, and has since been on his own. He describes his operation as "typical" with corn, soybeans, farrow-finish hogs, and a cow/calf beef herd. They use two confinement farrowing buildings and Cargill nursery and finishing units.

He said he had never been around a pasture farrowing system, so he modified his own system to become an outside system that does not have confinement buildings or farrowing crates. He has 80 to 90 sows, and farrows 20 sows every 40 days in individual farrowing huts on a concrete slab. Each sow has access to a 6x12-ft. exercise pen in front (the sow is never confined in the hut). Huts are enclosed under a frame structure with a single sloping roof with a closed north wall, which allows him to farrow year-round. Williams moves six to seven litters out of the farrowing pens and into a single-pen Cargill unit when pigs are two to three weeks old. All pigs stay together until they are weaned at six weeks. Sows are moved to Cargill breeding/gestation pens (he uses artificial insemination). Weaned pigs stay in lactation pens for another two to three weeks, then are moved to another Cargill pen where they stay until they're about 80 lb., at which time they move into one of his two hoop buildings, Cover-All,

and BioTech. Pigs are sold out of these buildings.

He is only getting started with Niman Ranch, but hopes to eventually sell most of his pigs through that company. Niman Ranch has strict standards, including:

- pigs must be raised on pasture or bedded pens (all pigs of any age must have access to bedding),
- no growth-promoting hormones or steroids are allowed,
- no continuous use of subtherapeutic antibiotics are allowed (unless pigs are treated for a specific problem for a short period of time), and
- no feeding of meat by-products is allowed.

He talked about some of the decision-making processes and philosophies he has used in his operation.

1. About confinement—"I have never been a confinement person, and I have never tried confinement. I look at confinement buildings as allowing you to maximize production, but they will not let you maximize profits. Confinement is bad for the producer's health, it's bad for the environment, and you must make a long-term commitment to raising hogs. It's hard to find outside labor for confinement, and I'm convinced that there are more disease problems in confinement. "

2. About herd management—"I have a completely closed herd and very seldom have any disease problems. I am concerned about market access and market availability. Other things that I do differently than confinement units are that I use no supplemental heat except for some heat mats in farrowing huts, also no ventilation fan, no antibiotics, and there's no liquid manure so I do not breathe manure pit

gases. The bottom line is my work is fun and it is not stressful. I enjoy working in the swine unit every day."

3. About sustaining his operation—"I am now developing a whole farm system to tie everything together. I have 225 acres of row crops on a five-year rotation. I plan to compost the hoop manure to provide the fertilizer on this land. I am hoping to develop the cow herd and to diversify. The bottom line: I am very interested in sustainable agriculture. I have two young sons and hope that at least one will want to continue the operation."

QUESTIONS:

Are animals shipped directly to California when sold to Niman Ranch?

Williams delivers animals to Des Moines where they are slaughtered and carcasses are then shipped to California. Currently, Niman Ranch buys 250 pigs per week. The program began two years and all indications are that it is a growing market. Their current price for pigs is \$43 per hundred-weight.

Do you have to use certain genetics?

Niman Ranch does not require certain genetics, but the meat must taste good. When they began the operation, Niman Ranch targeted Farmers Hybrid Breeding Stock, which Williams said is no longer in business. Williams had used Farmers Hybrid genetics for more than 30 years, so Niman Ranch was a perfect fit for marketing his pigs. Niman Ranch does a taste test on every load sold, and if pork does not meet this specification, the sale does not go through. This pork goes to upscale restaurants in the San Francisco area and it must taste good.

Tell us more about your farrowing system. Originally, Williams' operation was set up

on a seasonal farrowing schedule. But when he started selling to Niman Ranch, which needed pigs year-round, he modified his schedule. "When it's 20 below zero, I will be worried about those pigs," he said. "I may have to add some more supplemental heat, but I think I can make it work."

Are your farrowing huts isolets or modified "A" huts?

Williams uses huts that are similar to isolets, which he orders from a Missouri company.

Do your farrowing huts have a floor?

The huts have an oak floor, but Williams uses a rubber mat to cover cracks in the flooring. The creep area is in the back, where he also uses a heat mat. Within a day or so, pigs find the heat mat. He also adds bedding when the sow farrows.

How are sows fed?

Sows use individual nipple waters and they are fed on the ground. Sows will eat about 20 pounds per day. "The most amazing thing is putting the sow and pigs together when the pigs are 10 to 14 days old," Williams said. "Pigs do not starve out, there's very little death loss, sows and pigs get exercise, and they get along quite well. It's low-tech, just a converted Cargill building."

Is your Niman Ranch connection as an individual or part of an emerging network in Iowa?

Niman Ranch started by word-of-mouth. But because of the good-tasting pork, they cannot keep up with demand. Paul Willis has recruited more producers and sets up the marketing.

Do you have a formal organization?

Right now, it's a very informal organiza-

tion. Producers sign an affidavit that says they adhere to the standards for the pork and its production. There is no contract and no guarantee. Sales depend on demand in California. Producers are on a list and are contacted in turn to supply the demand.

What is your cost of production?

Williams' cost is about 30 cents per pound, which includes labor. "I feel confident with this number," he said. "The buildings are paid for, and I feel like I can compete with anybody. It's market access that has me scared."

Are you hoping to develop this market in other geographical areas?

Yes. The group hopes to get a full-time salesperson for the Midwest. "I cannot say outside pigs taste better than confinement pigs, although some people claim that," Williams said. "However, it's a marketing tool in California, claiming this is a natural, outside-produced animal."

He also said this new market doesn't want really lean pigs—rather, pigs with 0.9- to 1.1-inch backfat. "I think the industry is figuring that out, too," he added, "maybe we have gone too far."

[To Gary Johnson] You stated you wanted the leaner genetics, would you change genetics to get high muscle quality?

Yes, if there was an economic advantage to do so. But currently to maximize income the producer needs to produce a lean hog. Johnson said he is reluctant to produce a fatter hog and not have a place to market them.

"I had been threatened by the packer already prior to going to leaner genetics that he needed leaner hogs," Johnson said.

"So I am leery in moving very fast in either direction. It has been a slow process in getting to the leaner genetics and it would probably be a slow process going back."

Johnson sees two markets for hogs: at IBP for heavier animals, and at Farmland for lighter, leaner hogs, so hogs are marketed accordingly. Hogs from a heavier genetic line are more durable and adaptable to outside facilities, he added.

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*Using hoop structures for early weaning
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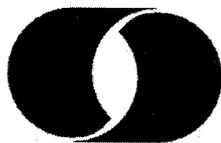
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