

# A Multiple Stakeholder View of the Potential for Hoop Structures in Iowa Swine Production

C.C. Hinrichs, assistant professor,  
Department of Sociology, Iowa State  
University  
Ames, Iowa USA  
and

J. Tranquilla, research assistant,  
Minnesota Institute for Sustainable  
Agriculture  
St. Paul, Minnesota USA

## ASL-R1592

### Summary and Implications

A survey of Iowa farmers and nonfarmers was conducted to determine public perceptions about the potential impacts of hoop structures on Iowa swine production and support for public research on hoop structures. Stakeholder groups included hog farmers using hoop structures; hog farmers not using hoop structures, farmers not raising hogs; veterinarians, vocational agricultural teachers, and agricultural lenders; and Iowa State University Extension personnel. Of the groups, hoop users most consistently saw favorable impacts on farm profits, public concern about animal welfare, farm quality of life, risk of water pollution, and odor reduction. Of the impact areas, all groups were most likely to see favorable impacts of hoop structures in reducing the risk water pollution problems.

Except for ISU extension personnel, less than half of each stakeholder group, including hoop users themselves, said taxpayer money should be used for hoop structures research. This study indicates generally favorable assessments about the impacts of hoop structures, especially in the environmental area, but no strong position on the part of these stakeholder groups that public agricultural research should be dedicated to hoop structures.

### Introduction

The movement toward use of large-scale confinement units in swine production has generated debate about rural environmental quality, the survival of small-scale family farmers, and the vitality of rural communities. The state of Iowa remains a national leader in swine production, but many Iowans are concerned about the future course of this industry in their state. Throughout the United States, the

structure and practice of swine production are characterized by growing industrialization and concentration. In 1980, there were 64,000 Iowa farms raising hogs, but that number had fallen to 21,000 by 1996. Remaining farms tend to have larger head inventories than in the past. Contract production arrangements have become more common. Although contracts insulate producers from some of the traditional risks of farming, they also shift the locus of many production decisions to an outside company. In this period of dramatic change in the swine industry, some people are focusing their questions on large livestock confinement units and their approaches to manure handling and odor control, their impact on family farm businesses, and the setting they provide for work and livelihood.

As part of this questioning, some swine producers are now exploring and adopting an alternative system of swine housing—the hoop structure. Hoop structures are simple frame buildings 30 to 40 feet in width and 60 to 80 feet in length, with poly-fabric tarp stretched over metal “hoops.” Within them, hogs are housed in large groups, with a concrete pad at one end for automatic feeders and waterers. The structure is deep bedded with straw or cornstalks and cleaned only after the hogs are moved out. Hoop structures have no artificial climate control. The hogs stay warm from the heat produced by the decomposition of straw and manure in the bedding pack. Ventilation is provided through the openings at the ends and side of the structure. Although they are primarily used for finishing and gestation, hoop structures also are being considered for other stages of swine production. Hoop structures require a significantly lower capital investment per pig space than confinement facilities. Part of the appeal of hoop structures lies in the relative flexibility of the systems which can be used for other purposes than swine production.

Given growing interest among some swine farmers in alternative production systems such as hoop structures, there is a need to assess more closely the potential of this agricultural technology. Public agricultural research institutions today face many choices about how to allocate scarce resources. They also face greater public scrutiny than in the past, including criticism for researching and developing certain technologies, such as bovine growth hormone,

which may improve agricultural production, yet may also, it is argued, undermine the viability of family farmers and the well-being of rural communities<sup>2</sup>. As a result, there is growing interest in the use of technology assessment to understand potential positive and negative impacts of a given technology and to generate information useful to the research decision-making process<sup>1</sup>.

Because the impacts of agricultural technology use often extend beyond the farm gate, there is also concern that a broad range of stakeholders be involved in agricultural technology assessment. Based on their day-to-day involvement with the farm enterprise, farmers are well qualified to evaluate the impacts of a particular technology on aspects of farm management and the local community and environment. But agricultural practices also concern consumers, nonfarming rural residents, and taxpayers, as well as those working in various agricultural support industries. Farmers remain critical stakeholders in agriculture, but they are joined by other nonfarming groups who also have interests and concerns about the social, economic, and environmental implications of current directions in agricultural production. New approaches to technology assessment increasingly emphasize the importance of democratic participation and diverse voices contributing to the assessment process<sup>6</sup>. In this view, technological decision-making should not be only the domain of experts and professionals. It also must consider and incorporate the input of a broader range of groups in our society.

The objectives of this exploratory research were threefold:

1. ✳ To determine levels of prior knowledge and awareness about hoop structures;
2. ✳ To gather input about the potential impacts of hoop structures for Iowa swine production and rural communities from a set of stakeholders, including, but not limited to swine producers;
3. ✳ To assess levels of support for directing public agricultural research toward hoop structures.

### Materials and Methods

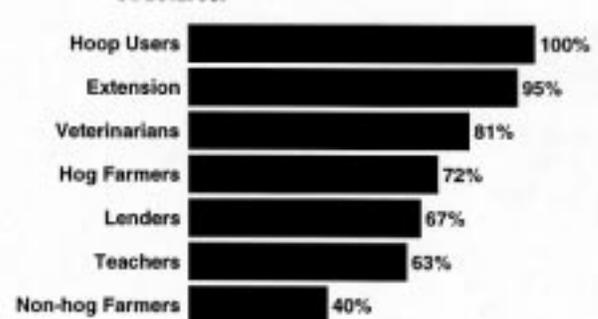
This project involved a multiple stakeholder mail survey of Iowa farmers and nonfarmers to determine perceptions about the potential impacts of hoop structures on Iowa swine production and support for public research on hoop structures. In October and November 1997, the Department of Sociology at Iowa State University conducted a survey of 2,635 Iowa swine industry stakeholders, following the Dillman Total Response Method<sup>3</sup>. A total of 977 mailed questionnaires was returned for a response rate of 37%.

Depending on the size of the stakeholder groups, a random sample or a complete census was made. Surveyed groups reported on herein include hog farmers using hoop structures (n = 57), hog farmers not using hoops structures (n = 322), farmers not raising hogs (n = 218), large animal veterinarians (n = 80), high school vocational agricultural teachers (n = 71), agricultural lenders (n = 82), and Iowa State University Extension county agents and field specialists concerned with agriculture (n = 38). Nonfarming groups were chosen based on their occupational proximity to the swine industry and to agriculture more generally. Some proximity to swine production was considered an important characteristic of nonfarming stakeholders to ensure sufficient knowledge and interest that respondents would complete a survey on the impacts of hoops structures.

### Results and Discussion

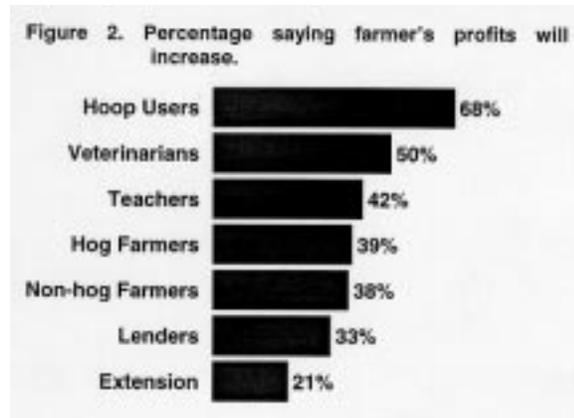
It is important to determine the familiarity different groups have with a technology such as hoop structures before asking their perceptions of potential impacts. Figure 1 shows the different groups' level of hoop structure awareness at the start of the survey, based on the percentage of each group having had exposure to hoop structures via two or more of the following routes: (1) print media, (2) conferences or seminars, (3) visiting a hoop structure, (4) requesting information from extension or hoops suppliers. Not surprisingly, hoop users and extension personnel had very high levels of exposure, followed next by veterinarians and nonhoop-using hog farmers. About a third of agricultural lenders had low exposure to hoop structures.

Figure 1. Percentage having high exposure to hoop structures.

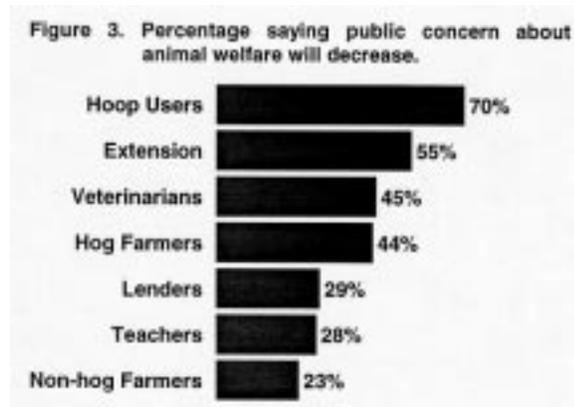


Profitability is a major consideration in the adoption of any new agricultural technology. Figure 2 shows the percentage of the different groups saying that farmers' profits will increase with greater use of

hoop structures. Hoop users were most likely to take an optimistic view on profitability (68%). Half of the veterinarians saw profits increasing, whereas 42 percent of the agricultural teachers did.

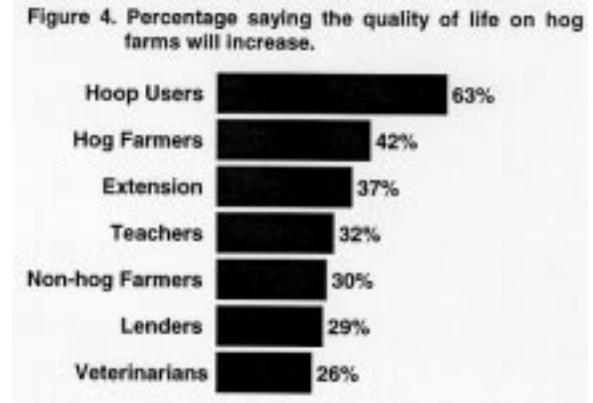


Animal welfare has been one area of contention in discussions about current swine production systems. Figure 3 shows the percentage of the different groups saying that public concern about animal welfare will decrease with more use of hoop structures. Seventy percent of hoop users saw such a decrease happening, whereas 55% of extension personnel did. Veterinarians and nonhoop-using hog farmers were more mixed in their appraisals about the effects of hoop structures on public concern about animal welfare.

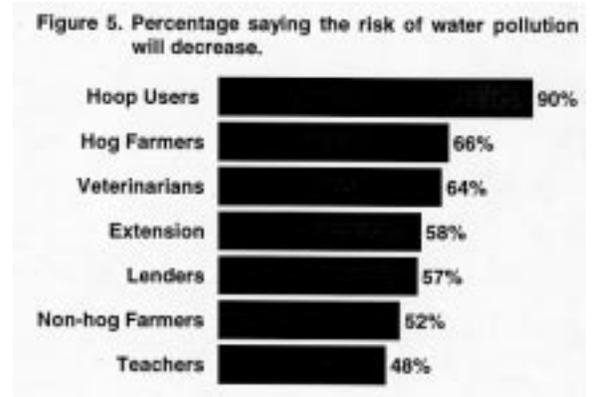


Livestock housing systems are important for animals and for farm profit, and affect the social interactions and work experiences of livestock-producing households. Such quality of life dimensions also may influence younger generations to continue or to begin livestock production. Figure 4 shows the percentage of the different groups saying that the quality of life on hog farms will increase with greater use of hoop structures. Hoop users

themselves again were most likely to take this view (63%), followed at some distance by nonhoop-using hog farmers (42%) and extension personnel (37%).



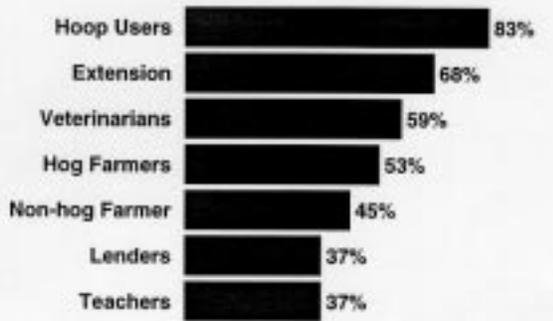
Growing concern about the protection of water quality is a factor in debates about swine production systems. Because they are based on a system of solid manure management, hoop structures, according to some, have environmental advantages over large-scale confinement facilities. Figure 5 shows the percentage of the different groups saying that the risk of pollution to streams, rivers, and lakes will decrease with more use of hoop structures in Iowa. A strong majority of hoop users (90%) took this view, whereas close to two-thirds of the nonhoop-using farmers and the veterinarians also saw a decreased risk of water pollution. More than half of extension personnel, agricultural lenders, and non-hog farmers also took this view.



Odor control is another area where hoop structures, due to their system of manure management, may have some advantages over large-scale confinement facilities. Figure 6 shows the percentage of the different groups saying that odor from animal manure will decrease with more use of

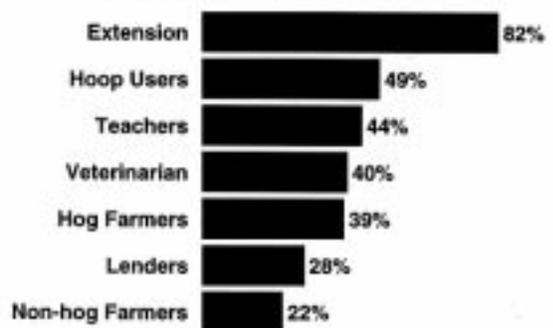
hoop structures in Iowa. Hoop users strongly took this view (83%), followed by extension personnel (68%), veterinarians (59%), and nonhoop-using hog farmers (53%).

Figure 6. Percentage saying odor from animal manure will decrease.



Having investigated stakeholders' perceptions about various potential impacts of hoop structures, the survey also asked about opinions on the role of the university in agricultural research. Figure 7 shows the percentage of the different groups answering "yes" when asked whether taxpayer money should be used to support research on hoop structures. Extension personnel (82%) overwhelmingly felt that it should. Hoop users themselves were more divided with 49% saying yes to taxpayer supported research on hoop structures. The least supportive group was non-hog farmers (22%).

Figure 7. Percentage saying taxpayer money should be used for hoop structures research.



The call for more comprehensive and democratic approaches to agricultural technology assessment prompted this multiple stakeholder mail survey of Iowa farmers and non-farmers concerning their perceptions about the potential impacts of hoop structures on Iowa swine production and rural communities. Exposure to and familiarity with hoop structures was highest for those using hoop structures

or working fairly closely with the swine industry. Not surprisingly, hoop users themselves were most likely to see a variety of favorable impacts with greater use of hoop structures. These positive impacts included greater farm profits, lower public concern about animal welfare, increased quality of life on the farm, reduced risk of water pollution, and less odor from animal manure. For the entire sample, perceptions of favorable impacts were strongest concerning water pollution, 48% or more of each stakeholder group saw a reduced risk of water pollution with hoop structures.

Perceptions of favorable impacts were more dispersed across other impact areas. Nonhoop-using hog farmers, extension personnel, and veterinarians tended to have the most favorable perceptions of impacts after hoop users themselves. Despite hoop users' highly favorable perceptions of impacts of hoop structures, slightly less than half said taxpayer money should be used for hoop structures research. The survey did not assess general attitudes towards public agricultural research, nor views about the private sector's role in agricultural research or in research on hoop structures more specifically. Therefore, it is not clear whether those not favoring the use of taxpayer money for hoop structures research are opposed to public research generally or opposed to hoop structures research in particular. These are questions deserving exploration in future research about the impacts of swine system technologies.

### Acknowledgements

This research was supported by a grant from the Center for Rural Affairs (Walthill, NE) and through the Leopold Center for Sustainable Agriculture, Iowa State University. The report appears in a slightly different form in Vol. II, Animal Productions Systems and the Environment. Conference Proceedings July 19—22, 1998. Des Moines, IA.

### References

1. Bird, Elizabeth, Doug Jackson-Smith, Brad Barham, and Frederick Buttel. 1996. "Integrating technology assessment into agricultural research choices." *Consortium News* 12: 7—8, 15—16.
2. Buttel, Frederick H. and Charles C. Geisler. 1989. The social impacts of bovine somatotropin: Emerging issues. Pp. 137—160 in *Biotechnology and the New Agricultural Revolution*, J.J. Molnar and H. Kinnucan (eds.) Boulder, CO: Westview Press.
3. Dillman, Don A. 1978. *Mail and Telephone Surveys: The Total Design Method*. New York: John Wiley & Sons.

4. Lawrence, John D. 1997. Pork Industry Statistics. Iowa State University Extension.
5. Kreidler, Mick. 1995. Strong grassroots opposition to large livestock units pp. 30—32. Wallace's Farmer. (December).
6. Sclove, Richard. 1993. Technological politics as if democracy really mattered: Choices confronting progressives. pp. 54—79. In M. Shuman and J. Sweig (eds.). Washington, DC: Institute for Policy Studies.