

Consumer Attitudes Toward Manure Storage, Handling, and Application Methods

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Summary and Implications

Participants indicated a level of concern for environmental impacts and livestock production. Approximately half (46%) was very concerned, whereas 36% were somewhat concerned. In addition, most indicated they were concerned with the worker and animal environment. Only approximately half indicated they were somewhat (30%) to very (24%) concerned about farm structure. Approximately 6 in 10 indicated pasture production was a favorable livestock production system, whereas, about half (53%) indicated they were somewhat unfavorable to not favorable toward total confinement livestock production. Again, this points out the potential for niche livestock markets as well as industry information dissemination and education on the different livestock production methods. Past information dissemination/ educational efforts have tended to focus on the direct industry participants, input suppliers, and producers. It is important to realize that the ultimate stakeholders in any industry are the consumers. They, too, need to be considered in information dissemination/ educational efforts.

Introduction

Environmental issues related to livestock production have received increased attention in recent years. These environmental issues have included surface and ground water quality, as well as livestock odors. One of the industries at the forefront of this attention has been the pork production industry. Manure spills have increased the concerns surrounding livestock production and the environment. This recent attention has brought a great deal of scrutiny to the hog industry and now effort is being taken by the industry to calm these concerns. States such as Iowa and North Carolina have a large vested interest in this industry because it is an important part of the economic base of these states.

This study focuses on societal concerns about livestock production and perceptions about methods available for livestock manure storage, handling and application methods. These methods have implications for environmental

improvements. The industry's ability to effectively handle environmental issues within a sustainable framework will be key to its competitive position. There is little research on societal attitudes and perceptions on these practices. They may be in line with scientific evidence or there may be direct conflict between perception and actual impacts.

Materials and Methods

This study was structured to cut across many sectors of society. Pork producers, their neighbors, agribusiness personnel, and others in neighboring rural communities, along with pork consumers located in urban areas far removed from pork production operations were surveyed. Those most directly impacted (i.e., producers and neighbors) by environmental issues arising from pork production such as odor, as well as those less directly impacted by pork production environmental issues (i.e., urban consumers located long distances from pork production operations), were asked to provide information on their knowledge and acceptance of manure storage and application rates.

The surveys consisted of two main parts: a general survey, and a more specific survey on environmental attributes.

Results and Discussion

General information on participant response to issues of concern such as environment and food prices is shown in Table 1. In the survey a 1 was very concerned and a 5 was not concerned. In general, participants were very to somewhat concerned about the environment, water quality, air quality, food prices, and pollution. The level of concern was lower for family farming, production methods, animal welfare, confinement livestock systems, and changing farm structure.

Information in the lower portion of Table 1 provides participant attitudes toward attributes such as quality and taste for the food products they consume. For this information a 1 indicated very important, whereas a 5 indicated not important. All were very concerned to somewhat concerned about food eating quality, visual appeal, freshness, and price. Production methods used in producing the food, and uniformity of product had lower levels of importance.

Information in Table 2 shows participant responses to acceptability of methods producers can use to reduce odors from livestock facilities. Filtration of air from livestock buildings was an acceptable method for odor reduction. Microbial and enzyme additives to manure, as a method for odor reduction, had a lower level of acceptability. Chemical

Table 1. Issues of concern and importance.

Item	All Participants
<u>Issues of Concern^a</u>	
Environment	1.64
Water Quality	1.38
Air Quality	1.55
Food Prices	1.93
Family Farm	2.59
Production Methods	2.44
Animal Welfare	2.37
Pollution	1.48
Confinement	2.44
Structure of Agriculture	2.94
<u>Issues of Importance^b</u>	
Eating Quality	1.20
Visual Appeal	1.68
Freshness	1.18
Price	1.75
Production Methods	2.20
Uniformity of Product	2.14

^aThe question was, On a scale from 1 through 5 with 1 being very concerned and 5 being not concerned, how concerned are you about the following issues:

^bThe question was, On a scale from 1 through 5 with 1 being very important and 5 being not important, indicate how important the following attributes are for the products you consume:

additives to manure were even less acceptable. Likewise, use of chemicals in a hog's diet as a means of odor control was not acceptable to participants. Use of natural additives to a hog's diet was highly acceptable.

When considering odor control, manure storage and injection methods were a concern for participants. The range of those indicating somewhat to not acceptable ranged from 26% for manure storage above ground, to 41% for manure storage below ground, and 51% for manure storage under the hog building. Participants were more accepting of manure storage systems that were above ground and away from the pigs. The highest level of acceptance was for composting with bedding material. Forty-three percent indicated that this was acceptable.

It is important that approximately one-fourth of the participants were neutral with respect to the method of manure storage and incorporation method. Another 10–20% had no opinion in these areas. Given this, there is an educational focus needed because a large number of participants had neutral to have no opinion responses. Neutral responses are not strong in the policy debate. Additionally, a no opinion response is one that can be moved into the acceptable or not acceptable with information. Although some may draw the inference that

consumers are concerned about environmental issues, they do not have an interest in how the industry achieves these goals. Recent experience has shown that as the level of complexity of production decisions increases it is necessary to have a significant educational component. Consumers are less willing to live by the "Trust me. It is good for you," approach. They want to know the facts. They are coming to conclusions and conclusions drawn with good information are more sustainable.

Information in Table 2 provides participant acceptability of manure injection and storage methods as they perceive it relates to groundwater impacts. There were a large number of respondents providing a neutral (22–23%) or no opinion (12–16%) response. When groundwater was considered, injection had the lowest level of acceptability; 43% indicating somewhat to not acceptable. It was acceptable for only one in five participants. Half (50%) indicated that manure storage above ground in steel/cement structures was acceptable. Below ground storage was acceptable for 37% of the participants. This table points to a needed industry educational focus. The industry has had a major focus on producer education. A consumer education focus is needed as well to assist in bringing scientific evidence in line with perception.

Table 2. Acceptability of methods used to achieve a reduction of manure seepage into groundwater.

Method	Percentage of Participants					
	Very Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Not Acceptable	No Opinion
Injection of manure into the soil to a depth of 4 to 8 inches	4.91	14.72	21.78	15.34	27.61	15.64
Manure storage above ground in steel/cement structure	18.71	31.60	23.31	5.52	8.90	11.96
Manure storage below ground in steel/cement structure	15.38	23.38	22.46	12.00	14.46	12.31

Table 3 provides information on participant acceptance of methods used for manure storage and application related to surface water impacts. Results are similar to those shown in Table 2 for groundwater. Again, it was interesting that injection was less acceptable than surface application. Also, manure storage above ground was more acceptable than injection.

Participant concerns about issues that are related to production and the farm are presented in Tables 4 and 5. Information in Table 4 shows that most of the participants (82%) are concerned about the impact of livestock production on the environment. Eight in 10 are concerned about the worker environment, whereas 7 in 10 are concerned about the animal environment (Table 4). A smaller amount or approximately half the participants indicated a concern about the structure of the farm industry.

A larger share of the participants indicated they were somewhat to not favorable toward producing hogs in total confinement facilities. It was favorable to 13% of the participants. A larger share of the participants, about 6 in 10, indicated that pasture production was a favorable production method.

A common phenomenon in the responses was the percent of participants indicating a neutral to no opinion response. About 35% of the respondents indicated this response. This points out the need for industry education efforts. An educational focus is needed for consumers. Past efforts have focused on producers. Although the producer educational efforts have been successful, a consumer focus is needed as well.

Table 3. Acceptability of methods used to achieve a reduction in runoff or spill of manure into surface water.

Method	Percentage of Participants					
	Very Acceptable	Somewhat Acceptable	Neutral	Somewhat Unacceptable	Not Acceptable	No Opinion
Injection of manure into the soil to a depth of 4 to 8 inches	5.21	15.34	23.62	14.11	26.99	14.72
Manure spread on top of soil with immediate incorporation	6.13	24.54	23.62	16.26	18.10	11.35
Manure storage above ground in steel/cement structure	19.02	32.52	20.86	5.83	8.90	12.88
Manure storage below ground in steel/cement structure	14.11	23.62	22.09	11.04	15.64	13.50

Table 4. Participant concerns about farm issues.

Issue of Concern	Percentage of Participants					
	Very Concerned	Somewhat Concerned	Neutral	Somewhat Unconcerned	Not Concerned	No Opinion
Environmental impact from livestock production	46.15	36.00	11.38	2.15	1.54	2.77
Worker environment	42.33	36.50	13.80	2.76	1.23	3.37
Animal environment	32.62	34.15	20.00	6.15	3.69	3.08
Farm structure	23.55	30.07	23.19	6.52	4.35	12.32

Table 5. Participant concerns about livestock production methods.

Issue of Concern	Percentage of Participants					
	Very Favorable	Somewhat Favorable	Neutral	Somewhat Unfavorable	Not Favorable	No Opinion
Hoop	2.18	4.67	16.20	2.80	8.41	65.42
Partial Confinement	5.61	23.05	29.28	13.71	9.35	19.00
Pasture	36.39	22.02	17.43	4.59	4.28	14.98
Total Confinement	4.05	9.35	15.58	10.59	42.68	17.76

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