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Who is Willing to Pay to Keep Livestock Production Away?*

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Abstract

Residents have opposed location of nearby livestock facilities. Illinois residents were asked how much they would be willing to pay (WTP) to stop a dairy from locating near them. Most respondents would not pay. Demographic characteristics (income, education, age, gender, agricultural interest, activism, etc.) were used to evaluate respondents WTP.

Key Words: Opposition to livestock facilities, willing to pay, demographics

JEL Classifications: Q19, Q56,

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Introduction

The dairy industry in the United States is experiencing structural changes (size, concentration, and regional shifts). The number of farms and milk cows nationwide is projected to decline, but the actual number of cows per farm is expected to increase. Regional shifts in dairy production are also evident. From 1997 to 2002 milk cow numbers increased by 48% in New Mexico and 43% in Idaho (NASS 2005). Whereas, Illinois had an 11% decline and Wisconsin, a major dairy state, had a 9% decline in cow numbers (NASS 2005). Trends similar to those in Illinois and Wisconsin were experienced by other midwestern and eastern states. Illinois and the midwestern dairy industry will likely need to adopt a more competitive structure in order to sustain or increase milk production in the region.

Apparently however, not all the change in dairy is due to size or regional reasons. In many instances public sentiment plays a stronger role in siting decisions. There have been several cases in Illinois recently where dairy farmers seeking to build large, new dairies have met with substantial resistance and animosity from members of the communities where they were locating (Fargo and Cook). In one instance plans for a 2,500 cow dairy were withdrawn due to

the opposition of residents and community leaders (Anderson 2000). Another large dairy was successfully established in Illinois after incurring significant delays and cost escalations due to legal challenges from a number of parties opposed to its development (Fuhrig and Morris 2000). In areas experiencing urban encroachment or growth in rural residence smaller, established dairies have also experienced conflict from their new neighbors complaining about odor, flies, or runoff into streams. A dairyman with a 180 cow dairy chose to leave Illinois because of complaints from new residents about odor and manure spills in streams (Williams).

What impact these very visible and public conflicts have on the interest of other dairymen to prospectively locate a new or expanded operation in Illinois is unknown. Moreover, if historic trends continue, this expanded output will come from larger, more technologically and economically efficient dairy operations. This dichotomy, the need for change versus resistance to growth in dairy farming, motivated the study upon which this paper is based.

Literature Review

Previous studies have focused on conflicts between industries creating real or perceived negative environmental, economic or social externalities, and their neighbors. Areas emphasized are how perceptions are influenced by complaint type and distance from the source, the individual's demographics, group affiliation, neighborhood description, connection to agriculture, and organizational structure.

Complaint Type

Jones, et al reported that neighbors of livestock farms in Lancaster County complained most frequently about odors and flies or other insects. Noise was of least concern. In studies of conflicts between hog farms and residential populations Rhodes; and Abdalla, Lanyon and Halberg reported that traffic, air, and water externalities were the major causes. Lohr in a study

of rural air quality found that odor annoyance increased with odor concentration and that neighbor's perceptions were dependent upon the emotions and memory of the perceiver.

Demographic

In a study of hog farm location Roe, Irwin and Sharp reported that the influence of education and unemployment on hog inventories varied by region. In Midwestern states hogs moved out of counties having higher average education levels during the mid 1990's. In a study of attitudes toward management of the Greater Yellowstone Ecosystem, Reading, Clark and Kellert found gender variations. Males scored lower than females on the ecosystem management (conservation) scale.

Group Affiliation

In a study of support for waste siting facilities Spies et al (1998) found that leaders were more likely than residents to perceive economic benefits related to a facility. In a review of a study by Roper Starch Worldwide Inc. (2000), Wachenheim and Rathge (2000) reported that perceptions differed between farmers and consumers about chemicals and fertilizers entering groundwater and surface water. Both groups considered them to be problems, but significantly more consumers considered them to be major problems.

Neighborhood Description

In a study of societal perceptions of agriculture, Wachenheim and Rathge (2000) found significant differences between the perceptions of farm, rural non-farm, and city residents. In a study of residents living within one mile of a hog farm Lohr found that residents living in a suburb or small town had a higher level of odor annoyance and were more likely to have negative odor perceptions than rural residents.

Organizational Structure

Wachenheim and Rathge reported that nearly one-half of all respondents strongly agreed that large scale farms create more environmental concerns and that the trend toward farm consolidation will have negative economic and social consequences. A study conducted by Buttel and Jackson-Smith found that Wisconsin farmers' concerns about livestock expansion were shaped by the issue of farm structure. Farmers strongly supported family-scale operations as opposed large-scale farms using hired labor or investor-owned operations. The authors concluded that most farmers who opposed livestock expansion did so because of their concern about the decline of family farming in Wisconsin.

A more complete review of this literature is found in Coe.

Objectives

Our purpose was to measure the perceptions of social groups who may be affected by the development of a new or expanded dairy farm in their community. Of particular interest were residents, local community leaders, dairymen and nondairy farmers of selected Illinois counties. Other groups of interest included individuals with environmental interests, agribusiness leaders who were dairy supporters and residents of one county each in Indiana and Iowa that have recently experienced dairy farm growth.

Through survey response analysis it is hoped that individuals who will oppose a new or expanded local dairy can be distinguished from those who will support such expansion. We use WTP question to capture an attitudinal opposition to a new dairy as opposed to an opinion opposition. If so, it may be possible to differentiate communities that will support or oppose dairy by the composition of their residents' characteristics.

This information can be used in the siting decision of a dairy enterprise to minimize the potential for conflict and related costs, both financial and non-financial, to the dairyman and the

community. This may be particularly useful in situations where flexibility exists in the siting of new dairies. These are frequently large, turn-key operations that are highly visible and may be perceived to have widespread community impact.

Our objective was to determine which characteristics increase the likelihood an individual's WTP to keep a livestock operation away. Characteristics evaluated were grouped into seven categories (1) demographic— gender, rural vs. nonrural, age, education, income, political affiliation, (2) experience— lived or worked on dairy, farm background, financial stake in agriculture, (3) affiliation or occupation—dairy farmers, non-dairy farmers, community leaders, environmental or sustainable interests, (4) dairy counties— Illinois dairy counties, Iowa dairy county and Indiana dairy county, (5) general opinions— economic growth, environmental regulation, (6) activism— intention for activism, previous activism, (7) dairy opinions—positive impacts of a new dairy on a community, negative impacts of a new dairy on a community, desired distance between residence and a dairy.

Method

The tool for conducting this study is a mail survey that was sent to a sample of subjects selected from the target groups described above. The questions in the survey were developed with input from agriculturists and community leaders. Focus group meetings with farmers and community leaders were held in Clinton and Christian counties. Applied Research Consultants (ARC), a survey consulting group, was employed to conduct the focus group and aid in the survey instrument development. An electronic version of the survey was administered to Illinois extension personnel to test the instrument. The final survey included questions about the demographic characteristics of the respondents as well as their opinions about a number of issues related to the environment, economic growth, industry, regulation, community activism,

agriculture, and dairy farming. The survey was mailed with a cover letter then followed with a follow-up letter and survey during February and March of 2002.

Most of the subjects who were surveyed were selected from 14 Illinois counties including six traditional dairy producing counties and eight that did not have significant dairy output. The six dairy counties were Clinton, Effingham, Jo Daviess, McHenry, Stephenson and Washington. The eight non-dairy counties were Champaign, Christian, Fulton, Hamilton, Knox, McLean, Union and Wabash. In choosing these counties secondary consideration was given to diversifying geographic location and demographic characteristics including population density and growth, household income, unemployment and non-farm employment.

In these fourteen counties all cities having populations exceeding 15,000 were excluded, and 300 adult residents were randomly selected from each county. The sample list was selected by InfoUSA of Omaha, Nebraska. An equivalent number of residents were selected from each county regardless of its population and responses were not weighted, the responses of this and all other groups sampled represent the respondent group and not its general population in the county or state. Samples of non-dairy farmers and community leaders such as mayors and county board members were also selected from these fourteen counties. A state-wide sample of 810 dairy farmers received the survey. Other groups surveyed were agricultural business managers, members of environmental interest groups, and residents from two areas experiencing dairy expansion, Sioux County, Iowa; and Newton County, Indiana. Of the 6,563 surveys mailed 1,923 usable surveys were returned. A summary of sample groups and response rates are contained in table 1.

Cross tabs between WTP question and other questions was used to screen out a number of questions in each category. Ordinal logistic regression was used to determine the effect of

characteristics within each category on increasing or decreasing the likelihood of an individual's WTP to keep a dairy away. Three separate models were estimated for their response to keep a 50-cow dairy, a 500-cow dairy and a 2500-cow dairy away.

Results

Previous results from the survey revealed that residents from dairy counties or individuals with agricultural backgrounds, or individuals with experience living near a dairy were more supportive of dairy. Air and water quality were the major concerns associated with a new dairy among residents. New jobs and expanded tax base were the perceived benefits of a new dairy. Residents without a farm backgrounds or experience living near a dairy are less sure that existing regulations are adequate. Although most residents are against forcing a dairy to move, residents from non-dairy counties or without agricultural experience are more willing to force a dairy to move. Although most residents are unwilling to pay to keep a dairy away, residents are more willing to pay to keep a large dairy away than a small dairy. About 25% of the residents were willing to pay to keep a large dairy away as only 5% were willing to pay to keep a 50-cow dairy away (table 2). From table 2, all sample groups showed an increase in the percent of individuals willing to pay as the size of the dairy increased. Dairy farmers were less likely than Illinois residents to pay to keep a small dairy away, but were more likely to pay to keep a 500-cow or 2500-cow dairy away. The environmental interest group was most likely to pay, and the agribusiness group was least likely to pay. Residents from the Iowa dairy county were more likely to pay than residents from the Indiana dairy county, but both counties were more likely to pay than residents of Illinois counties.

The results of the three ordinal logistic regression models are reported in table 3. The dependent variable is the response to the amount willing to pay to keep a dairy from locating

near their residence. The reference response is willing to pay greater than \$5,000. The estimates indicate the change in the odds ratio or the log likelihood of being in the reference group, or willing to pay the most to keep a dairy away for a given characteristic. A positive estimate increases the odds ratio of being in willing to pay greater than \$5,000, and a negative estimate decreases the odds ratio.

Demographics

Demographics included gender, rural residence, age, education, income and political affiliation variables. The variables: male, rural, democrat and independent were binary variables (1 if true, 0 if false). The variables for age, education and income were category variables. For 50-cow-dairy model, there were few characteristics with significant estimates. For the 500-cow and 2500-cow models, a number of categories in the education and income variables indicated decrease in the odds ratio to pay. The odds ratio of willing to pay declined with lower education levels and lower income levels. The independent political affiliation also reduced the odds ratio for the 2500-cow model, otherwise the remaining variables were not significant ($p < .1$).

Experience

The experience group of variables were lived near or worked on a dairy, a farm background, and a financial stake in agriculture. A farm background increased the odds ratio to pay for the 500-cow and 2500-cow models. This was somewhat unexpected given previous work showing individuals with farm background supportive of dairy. It is important to remember only a small percent of the respondents were willing to pay to keep a dairy away, and within the agricultural community there are those with strong opinions either in support or in opposition to large farms. The results indicate that being from the population having a farm background increases the likelihood to pay to keep a dairy away. This, however, cannot be

interpreted as meaning that those with farm backgrounds are opposed to dairy. The estimates for those who lived near or worked on a dairy have the expected sign indicating less likely to pay, but estimates were not significant ($p < 0.1$).

Affiliation or Occupation

The affiliation group represented those specific targeted populations rather than the randomly sampled population of residents from specific counties. The groups included dairy farmers from Illinois, farmers from Illinois, community leaders— mayors and county board members, and individuals with environmental interests. Estimates indicated that dairy farmers and the environmental interest group had increased odds to pay to keep the 500-cow and 2500-cow dairies away. This was expected given the results of the cross tabs in table 2.

Dairy Counties

This grouping of variables identifies those residents in Illinois dairy counties, residents from an Indiana county with dairy growth and residents of an Iowa county experiencing growth in dairy. Approximately 40% or more of agricultural revenue comes from livestock in those counties. The estimates indicated increased odds to pay for residents from Illinois and Iowa dairy counties for the 500-cow and 2500-cow dairies. Results for the Indiana dairy county were inconclusive.

General Opinions

General opinions included agreement or strong agreement with the statements, “Increased economic growth would benefit your community.” And “Environmental regulation of business is not important.” The variables were coded as binary, 1 being in agreement, 0 being neutral or in disagreement. Agreement that economic growth benefits community did not affect the willing to

pay response. Those in agreement with environmental regulations of a business is not important reduced the odds ratio of willing to pay for the 500-cow and the 2500-cow dairy.

Activism

Activism grouping included three binary variables: an indication one would join a support group for a new business that they supported, an indication one would join an opposition group to a new business that they opposed, and whether they previously actively supported or opposed development of a new industry in their area. Estimates for join a support group for a new business indicated a decrease in the odds ratio for willing to pay for the 500-cow and 2500-cow dairy. The opposite as expected was true for join an opposition group. Additionally, the estimate indicated an increase in the odds ratio to pay to keep away a 50 cow dairy. Estimates for those indicating previous activism indicated an increase in the odds ratio to pay to keep away also for all three sizes of dairy farms. This likely suggests that the opposition activists outnumber the support activists in the sample.

Dairy Opinions

Dairy opinions grouping included four variables, two variables indicating agreement with potential benefits of a new dairy industry in the community and two variables indicating potential problems. Again these were initially categorical variables with responses of strongly agree, agree, neutral, disagree and strongly disagree, but for this model were coded as binary, 1 being agree or strongly agree, otherwise zero. The two variables perceiving benefits from a dairy were new jobs and expanded tax base. Estimates for those variables had the anticipated signs, but only the expanded tax base resulted in a decrease in the odds ratio for the 2500-cow dairy. The two variables perceiving problems with a new dairy were offensive odor, a pollution problem and hurts existing farmers, a structural problem. Estimates for offensive odor indicated

an increase in the odds ratio to pay for all three sizes of dairy. Estimates for hurts existing farmers resulted in an increase in the odds ratio to pay to keep the 500-cow and 2500-cow dairy away.

The last variable in the dairy opinion grouping was respondents' indication on how near they would be willing to live near a dairy. The choices were ¼ mile, ½ mile, 1 mile, 3 miles, or greater than 3 miles. Previous analysis indicated responses were distributed uniformly across these choices and that this question was a good proxy for an individual's opinion toward dairy in that those willing to live closer were more favorably predisposed towards dairy and the opposite was true for those not willing to live closer. For this analysis, this question was coded as a binary, 1 being for the 3-mile and greater than 3-mile choice. The estimates for would not live within 3 miles indicated an increase in the odds ratio to pay for all three dairy sizes.

Conclusions

Now to answer our question, "Who is willing to pay to keep livestock production away?" From a demographic perspective, we did not find gender, age, political affiliation or a rural residence altered the likelihood of willingness to pay. With regards to education we found that individuals with fewer years of education and lower income were less likely to pay to keep a dairy away. This suggests regardless of ones opinion towards dairy having the means to pay is one factor. There is likely a correlation between higher income and more years of education.

From the experience, affiliation and dairy county grouping, we had expected and unexpected results. The environmental interest group as expected were more likely to pay to keep a dairy away, but unexpected was farm background individuals, dairy farmers and individuals from dairy counties. Prior analysis found these groups favorably predisposed toward dairy. An explanation for this is suggested from the dairy opinion group in those individuals

who believe a new dairy hurts existing farmers. Within these groups is likely a population that is concerned about the structure of agriculture becoming dominated by larger farms. Overall the percent of total dairy farmers willing to pay to keep the large 2500-cow dairy away was less than 31%.

Either intention of or indication of past activism was a key indicator of willing to pay that extended across all sizes of dairy farms. Related to this are individuals who believe dairy will result in environmental problems such as odor. This group also was more likely to pay to keep a dairy of any size away.

The implications for rural development and the livestock industry are that unless the industry can overcome the image of negative environmental problems, it will likely face opposition in areas that have a population with higher income and education levels. The industry also faces opposition from within its ranks from those concerned about the structural changes.

References

- Abdalla, W.W., L.E. Lanyon, and M.C. Halberg. "What We Know About Historical Trends in Firm Location Decisions and Regional Shifts: Policy Issues for an Industrializing Animal Sector." *Amer. J. Agr. Econ.* 77(1995):1229-36.
- Anderson, C. "Bellflower vote opposes mega-dairy." *The Pantagraph*, 2 November 2000.
- Buttel, F. and D. Jackson-Smith. "Livestock expansion in Wisconsin: Farmers' views on the benefits and costs of large-scale livestock production." PATS Research Report #2. Program on Agriculture and Technology Studies. Madison, WI: University of Wisconsin (1997).
- Cook, A. "Residents Oppose Dairy Plan." *Champaign News-Gazette*. Internet: www.newsgazette.com. August 26, 2000.
- Fargo, C. "Angry dairy foes crowd meeting." *The Springfield State Journal Register*. Internet: www.sj-r.com. December 10, 1999.
- Coe, L. M. "Perceptions about Living Near an Illinois Dairy Farm." M.S. thesis, Southern Illinois University Carbondale, October 2003.

- Fuhrig, F. and N. Morris. "Californian rules out Christian County site." *The State-Journal Register*, 21 April 2000.
- Jones, K., T. W. Kelsey, P. A. Nordstrom, L. L. Wilson, A. N. Maretzki, and C. W. Pitts. "Neighbors' Perceptions of Animal Agriculture." *The Professional Animal Scientist* 16(2000):105-110.
- Lohr, L. "Perceptions of Rural Air Quality: What Will the Neighbors Think?" *Journal of Agribusiness* 14(1996):109-128.
- National Agricultural Statistics Service. NASS online database. Internet: www.usda.gov/nass.
- Reading, Richard P., Tim W. Clark, and Stephen R. Kellert. "Attitudes and Knowledge of People Living in the Greater Yellowstone Ecosystem." *Society and Natural Resources* (1994):349-365.
- Rhodes, V.J. "The Industrialization of Hog Production." *Rev. Ag. Econ.* 17(1995):107-18.
- Roe, Brian, Elena G. Irwin, and Jeff S. Sharp. "Pigs in Space: Modeling the Spatial Structure of Hog Production in Traditional and Nontraditional Production Regions." *American Journal of Agricultural Economics* 84(2002):259-278.
- Roper Starch Worldwide Inc. "Gap Research: Consumer and Farmer Opinions about Food and Agriculture." The Philip Morris Family of Companies (2000). Reviewed in Wachenheim, Cheryl, and Richard Rathge. "Societal Perceptions of Agriculture." Department of Agribusiness and Applied Economics, Agricultural Experiment Station, North Dakota State University, Fargo, ND, 2000.
- Spies, Sherrill, Steve H. Murdock, Steve White, Richard Krannich, J.D. Wulfhorst, Krissa Wrigley, F. Larry Leistritz, Randy Sell, and JoAnn Thompson. "Support for Waste Facility Siting: Differences between Community Leaders and Residents." *Rural Sociology* 63(1998):65-93.
- Wachenheim, Cheryl, and Richard Rathge. "Societal Perceptions of Agriculture." Department of Agribusiness and Applied Economics, Agricultural Experiment Station, North Dakota State University, Fargo, ND, 2000.
- Williams, N. "Fourth-generation farm moving down the road." *Illinois AgriNews*. Vol. 27-No.34 p. C1. October 24, 2003.

Table 1. Survey Sample Population and Response Rate

		Sample	Responses	Percent			
Demographic Groups	Dairy Farmers	810	281	34.69%			
	Interest Group Members*	46	31	67.39%			
	Ag Businesses	33	21	63.64%			
	General Farmers**	500	128	25.60%			
	Community Leaders	393	195	49.62%			
	Subtotal	1782	656	36.81%			
	Residents:	Ag Stat	Sample	Responses	Percent	Population	Excluded Cities of 15,000+
		District					
Traditional Dairy Areas of Illinois	Clinton, IL	Southwest	300	92	30.67%	35,535	None
	Effingham, IL	East	300	85	28.33%	34,264	None
		Southeast					
	Jo Daviess, IL	Northwest	298	87	29.19%	22,289	None
							Alconquin, Cary, Crystal Lake, Lake in the Hills, McHenry, Woodstock
	McHenry, IL	Northeast	300	80	26.67%	260,077	Freeport
	Stephenson, IL	Northwest	300	93	31.00%	48,979	None
	Washington, IL	Southwest	299	84	28.09%	15,148	None
		Subtotal	1797	521	28.99%		
		Champaign, IL	East	299	94	31.44%	170,669
Non-traditional Illinois Dairy Areas	Christian, IL	West	298	63	21.14%	35,372	None
		Southwest					
	Fulton, IL	West	299	73	24.41%	38,250	Canton
	Hamilton, IL	Southeast	299	80	26.76%	8,621	None
	Knox, IL	West	300	84	28.00%	55,836	Galesburg
	McLean, IL	Central	298	89	29.87%	150,433	Bloomington, Normal
	Union, IL	Southwest	299	63	21.07%	18,293	None
	Wabash, IL	Southeast	299	71	23.75%	12,937	None
		Subtotal	2391	617	25.81%		
	Out-of-State	**Sioux, IA		300	52	17.33%	31,589
**Newton, IN			293	42	14.33%	14,566	None
		Subtotal	593	94	15.85%		
	Unknown Affiliation			35			
	Total	6563	1923	29.30%			

*Large response due to sampling method - 25 responses were collected via an environmental club meeting, otherwise the response rate would be $6/21 = 28.6\%$.

**Samples that were contacted via one mailing only.

Table 2. Percent of Sample Groups Willing to Pay to Keep a Dairy Away by Dairy Size

	\$0	\$500	\$1,000	\$5,000	Over \$5,000	Total n
50-cow dairy						
Resident	95.3%	3.2%	1.0%	0.1%	0.4%	1,030
Dairy farmer	98.5%	0.8%		0.4%	0.4%	261
Farmer	93.6%	5.5%			0.9%	109
Community leader	93.5%	3.5%	2.4%		0.6%	170
Indiana county	94.4%	5.6%				36
Iowa county	89.1%	6.5%	4.3%			46
Agribusiness	100.0%					19
Environmental interest group	76.9%	11.5%	5.8%		5.8%	52
Total	94.8%	3.4%	1.1%	0.1%	0.6%	1,723
500-cow dairy						
Resident	82.4%	10.7%	3.8%	1.6%	1.5%	1,016
Dairy farmer	78.2%	9.3%	6.6%	2.7%	3.1%	257
Farmer	76.4%	12.3%	8.5%		2.8%	106
Community leader	79.0%	9.6%	6.0%	2.4%	3.0%	167
Indiana county	77.1%	14.3%	8.6%			35
Iowa county	65.9%	15.9%	13.6%	4.5%		44
Agribusiness	84.2%	15.8%				19
Environmental interest group	46.2%	23.1%	9.6%	9.6%	11.5%	52
Total	79.4%	11.1%	5.2%	2.0%	2.2%	1,696
2500-cow dairy						
Resident	75.6%	10.4%	7.8%	2.1%	4.1%	1,020
Dairy farmer	69.3%	8.2%	8.9%	5.4%	8.2%	257
Farmer	66.4%	10.3%	11.2%	5.6%	6.5%	107
Community leader	70.8%	9.5%	8.9%	3.0%	7.7%	168
Indiana county	64.7%	11.8%	17.6%	2.9%	2.9%	34
Iowa county	59.1%	6.8%	18.2%	4.5%	11.4%	44
Agribusiness	78.9%		10.5%	5.3%	5.3%	19
Environmental interest group	42.3%	15.4%	13.5%	5.8%	23.1%	52
Total	72.0%	9.9%	9.0%	3.1%	6.0%	1,701

Table 3. Logistic Regression Model Results for Willing to Pay to Keep Dairy Away

	50 cow herd		500 cow herd		2500 cow herd	
	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Willing to pay to keep dairy locating near residence						
\$0	4.776 ***	0.939	2.243 ***	0.457	1.586 ***	0.397
\$500	5.975 ***	0.958	3.373 ***	0.466	2.292 ***	0.400
\$1,000	7.241 ***	1.011	4.481 ***	0.482	3.333 ***	0.409
\$5,000	7.585 ***	1.038	5.480 ***	0.516	3.918 ***	0.417
Demographics						
Male	0.432	0.425	0.189	0.209	0.293	0.185
Rural	-0.516	0.327	0.083	0.171	0.172	0.150
Age						
21-30	-0.961	1.109	0.103	0.454	0.553	0.364
31-40	-1.158 *	0.613	-0.010	0.270	0.042	0.231
41-50	-0.448	0.399	0.059	0.221	-0.138	0.196
51-60	-0.239	0.385	0.091	0.219	0.163	0.190
61 or above	0	.	0	.	0	.
Education						
Some high school or less	-0.886	0.861	-0.681	0.450	-0.612	0.389
Completed high school	-0.880 **	0.437	-0.559 ***	0.214	-0.627 ***	0.188
Some college	-0.599	0.402	-0.430 **	0.206	-0.450 **	0.178
Associate's Degree	0.560	0.446	-0.192	0.271	-0.390	0.242
Bachelor's Degree or higher	0	.	0	.	0	.
Income						
Less than \$15,000	-20.420	0.000	-1.262 **	0.537	-1.151 **	0.449
\$15,001 to \$39,999	-0.705	0.523	-0.833 ***	0.259	-0.867 ***	0.226
\$40,000 to \$59,999	-0.291	0.413	-0.436 *	0.225	-0.460 **	0.200
\$60,000 to \$90,000	-0.614	0.441	-0.416 *	0.233	-0.306	0.204
Greater than \$90,000	0	.	0	.	0	.
Democrat	0.361	0.357	0.123	0.190	-0.002	0.168
Independent	0.102	0.121	-0.091	0.064	-0.091 *	0.055
Experience						
Lived near dairy	0.204	0.365	-0.195	0.204	-0.222	0.179
Farm background	0.140	0.349	0.446 **	0.196	0.389 **	0.172
Financial stake in agriculture	-0.201	0.393	0.018	0.201	0.084	0.174
Affiliation or Occupation						
Dairy farmer	0.105	0.716	0.572 **	0.269	0.515 **	0.231
Farmer	0.159	0.585	0.300	0.323	0.447	0.276
Community leader	-0.473	0.490	-0.193	0.277	-0.223	0.241
Environmental interest group	0.739	0.571	0.947 **	0.386	0.760 **	0.364
Dairy Counties						
Illinois dairy counties	0.190	0.370	0.397 **	0.197	0.425 **	0.170
Indiana dairy county	-0.123	0.830	-0.033	0.509	0.129	0.459
Iowa dairy county	0.676	0.667	0.808 **	0.386	0.901 ***	0.348

Table 3. continued

	<u>50 cow herd</u>		<u>500 cow herd</u>		<u>2500 cow herd</u>	
	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
General opinions						
Economic growth benefits community	0.109	0.394	0.101	0.201	-0.071	0.174
Environmental regulation of business unnecessary	-0.107	0.641	-0.971 ***	0.337	-0.845 ***	0.262
Activism						
Join support group for new business	-0.408	0.387	-0.574 **	0.238	-0.408 **	0.208
Join opposition group to a new business	0.876 ***	0.321	0.765 ***	0.183	0.854 ***	0.163
Previously support/opposed business	0.566 *	0.326	0.476 ***	0.177	0.475 ***	0.155
Dairy Opinions						
New jobs	-0.092	0.361	-0.282	0.189	-0.064	0.167
Expanded tax base	-0.201	0.375	-0.294	0.189	-0.320 *	0.165
Offensive odor	1.950 ***	0.477	1.210 ***	0.187	0.972 ***	0.159
Hurt existing farmers	-0.533	0.356	0.384 **	0.178	0.514 ***	0.157
Would not live within 3 miles	1.157 ***	0.357	0.555 ***	0.182	0.394 **	0.161
n	1280		1268		1272	
model chi-square	138.09		263.102		291.23	
McFadden pseudo R square	0.22		0.139		0.116	

Significant differences Wald test * p<0.1, ** p<0.05, *** p<0.01