

Public Perceptions Regarding Growth of the Dairy Industry in Illinois

**C. Matthew Rendleman, William C. Peterson, Livy M. Coe, Phillip R. Eberle,* and
Kenneth E. Griswold (formerly of Dept. of Animal Science, Food and Nutrition)**

**Department of Agribusiness Economics
Southern Illinois University Carbondale
Carbondale, IL 62901-4410
*phone 618-453-1715 email eberlep@siu.edu**

*Selected Paper prepared for presentation at the Southern Agricultural Economics Association
Annual Meeting, Tulsa, Oklahoma, February 14-18, 2004*

*Copyright 2004 by C. Matthew Rendleman, William C. Peterson, Livy M. Coe, Phillip R. Eberle,
and Kenneth E. Griswold. All rights reserved. Readers may make verbatim copies of this
document for non-commercial purposes by any means, provided that this copyright notice
appears on all such copies.*

Public Perceptions Regarding Growth of the Dairy Industry in Illinois

Abstract

Community opposition to dairies has altered location decisions by milk producers. Our objective was to identify residents' perceptions towards dairy by individual and community characteristics. A mail survey of residents of dairy counties and non-dairy counties was conducted. Dairy county residents were more willing to live close to a dairy.

Introduction

Illinois produces an abundance of feed crops, has a milder winter climate than its northern neighbors, and has a strong farming culture, yet only produces one-fifth of the dairy products consumed in the state. The state produced around 2,081 million pounds of milk in 2001, (FAPRI 2001, 96), which is only 20 percent of the states' consumption of milk products. The state's production is further projected to decline to 1,888 million pounds (FAPRI 2001, 96) by 2010 even though national milk consumption is expected to grow at an annual rate of 1 percent till the year 2010 (FAPRI 2001, 92). In addition, states to the south of Illinois are deficit milk producing states. It would appear that Illinois has attributes and a potential market to provide opportunities to sustain or expand the state's dairy industry.

Despite the apparent potential for growth, Illinois' dairy production has been declining in terms of number of dairy farms, number of dairy cows, milk production volume, and value of production (NASS). Nearby states of Iowa, Indiana and Wisconsin have experienced similar trends, although to a lesser extent (NASS).

These trends in Illinois and its neighboring states result from the regional shift in milk production to the west and southwest U.S. From 1978 to 1997, milk cow numbers increased by 64% in California, 94% in Idaho, and 461% in New Mexico (NASS 2002). California has larger

dairy herds than Illinois, 624 cows/herd compared to 57 cows/herd (NASS 2000). California has greater milk production per cow than Illinois, 21,169 lbs/cow compared to 17,450 lbs./cow (NASS 2002), and California has lower cost of production per hundredweight of milk than Illinois. The Illinois' dairy industry will likely need to adopt a more competitive structure in order to sustain or increase milk production in the state.

Most farming activities, including dairying, have the potential to affect their communities in both positive and negative ways. The farm may stimulate local economic activity, create an attractive vista for all to enjoy, or it may impede traffic on roadways and pollute with fertilizers and chemicals. Sometimes conflicts occur between dairy farmers and their neighbors over issues such as odors or flies. Usually these issues are successfully resolved, particularly where neighborhoods are stable and their members have coexisted for some time. However, this peaceful coexistence can be severely disrupted when a new livestock operation seeks to locate in a community or even when an existing one undertakes a major expansion.

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. 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. However, it is clear that Illinois dairy producers must increase milk production to maintain market share of the state's milk products consumption. 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.

There were a large number of studies and papers published about 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, ethnicity, group affiliation, community attachment, neighborhood description, connection to agriculture, and organizational structure of the offending institution. A review of this literature is found in Coe.

Objective

The objective of this research is 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 are residents, political leaders, dairymen and nondairy farmers of selected Illinois counties. Residents for our study were randomly selected residents from rural counties in Illinois. For this paper the focus is on resident perceptions of dairy.

Through survey response analysis it is hoped that individuals who will support a new or expanded local dairy can be distinguished from those who will oppose such expansion. If so, it may be possible to differentiate communities that will support or oppose dairy by the composition of their residents. In addition, there may be other characteristics of communities

such as their historical and cultural traditions in dairy farming that may serve as predictors of community acceptance.

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 more specific research objectives are: (1) Determine Illinois residents' perceptions of dairy as a neighbor. (2) Determine relationship between perceptions of dairy as neighbor and opinions related toward economic and environmental issues regarding dairy. (3) Determine how perceptions of dairy as a neighbor and opinions related to economic and environmental issues regarding dairy are related to an individual's experience with dairy and agriculture and other demographic factors.

Method

A mail survey was developed to obtain the measurements of perceptions of Illinois residents regarding dairy as a neighbor and its economic and environmental impact. 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 and validate the instrument. The 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. In choosing these counties secondary considerations were 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.

The questions constructed to measure resident perceptions of dairy as a neighbor, the economic and environmental impact, and opinions toward adequacy of current regulation are presented in table 1. Differences in perception by demographic characteristics were tested using a Chi square test. Differences in perception were tested for the following demographics: dairy and nondairy counties, rural and nonrural residents, farm background, lived near dairy, political affiliation, gender, education and annual income.

Results

A summary of the respondent demographics, county and agricultural demographics of the study area are presented first. Of the 6,563 surveys mailed, 1,923 usable surveys were returned for a 29% response rate.

Respondent Demographics

Sixty-nine percent of residents have lived in their community 18 years or longer. This suggests a very stable group of people whose long-term residence may be expected to influence their community attitudes and behavior.

Fifty-seven percent of residents commute more than one mile. Likely, many live in the country and commute to jobs in town.

Forty-one percent of the residents live in rural areas. This represents a large group of farmers' neighbors who are not themselves engaged in farming, a group that may have different attitudes and beliefs about living near a dairy than farmers.

Sixty-one percent of the residents have some education beyond high school, and 24% have a bachelors degree.

Almost 60% of residents were age 51 or older. To the extent that age influences attitudes and beliefs it is important to be aware that we are dealing with an older population in our study.

Seventy-five percent of respondents were male.

Sixty-six percent of respondents had dependents living at home. It is not known whether the dependents are minor children or elderly.

For annual household income, 8% had less than \$15,000, 31% reported between \$15,001 to \$39,999, 28% were between \$40,000 to \$59,999, 22% were between \$60,000 to \$90,000 and 11% were greater than \$90,000.

For political affiliation, 45% of residents indicated Republican, 26% indicated democrat and 28% indicated independent or other.

Summary of county general demographics

Although there were large differences between non-dairy and dairy counties in some of their demographics, there were even greater differences between counties within the two groups for many of the demographic measures. Some of the important demographics are summarized here:

The average population of dairy counties was somewhat higher than that of non-dairy counties. However, there was a great range in values between all counties from a highly urban county having population greater than 260-thousand to a rural county with less than 9-thousand population. Population density is considerably higher for dairy than non-dairy counties. Between all counties population density ranged from 431 persons per square mile to 20 persons per square mile. Population growth during 1990 to 2000 was 3 times greater in dairy counties than non-dairy counties (USCB).

The poverty rate in 2000 in non-dairy counties was nearly double the rate for dairy counties. The average unemployment rate in non-dairy counties was 6.4% versus 4.1% for dairy counties (USCB).

Educational achievement in non-dairy counties (that includes Champaign county, the home of University of Illinois) was somewhat higher than for dairy counties. The average number of persons working in private non-farm jobs was the same for non-dairy and dairy counties. However, the rate of growth in non-farm employment during 1990 to 1999 was 36.2% in dairy counties versus 14.1% in non-dairy counties (USCB).

The non-dairy and dairy counties were very similar in the percentage of persons 65 years

or older. However, the dairy counties had a higher percentage of households having persons under eighteen (UCSB).

Counties with a dairy presence also have higher percentage of German, Polish or Dutch descendents as compared to the state (UCSB).

Summary of agricultural statistics

These agricultural statistics demonstrated significant differences between non-dairy and dairy counties for some measures and even greater differences within the groups for most measures. Some of the most noteworthy were: The average percentage of workforce employed in agriculture and forestry was similar for non-dairy and dairy counties at just below 5 percent. However, the variation within both groups ranged from agrarian counties having more than 8 percent to those having about one percent of their workforce employed in agriculture.

Farm consolidation was more rapid in the dairy than non-dairy counties during the period 1992 to 1997. The number of full-time farms declined by nearly 15 percent in the dairy counties versus 8.6% in non-dairy counties (NASS). However, the number of acres in farmland remained fairly constant for both groups. Thus, both experienced growth in farm size, with more rapid consolidation in dairy counties.

Based upon the market value of agricultural products sold, the non-dairy counties were somewhat larger than the dairy counties, but there were substantial differences between individual counties. The range for all counties was from \$238 million to \$21 million (NASS).

The average size of farms in non-dairy counties was larger than the dairy counties in terms of both acreage and market value of products sold.

For non-dairy counties only 13% of the value of products sold was from livestock products. Livestock products represented 49% of agricultural products sold for dairy counties (NASS).

Survey Results

Preference of dairy as a neighbor

The residents were asked to state their preference given the choice of living next to a dairy or an alternative neighbor. A majority of Illinois residents preferred dairy as a neighbor over the choices of a chemical plant, hog farm, coal mine and car wash. Illinois residents were split in their preference of living next to a dairy or a high school. A majority of residents preferred a subdivision, golf course, church and grain farm as a neighbor over dairy.

Distance between dairy and residence

Survey participants were asked to choose a distance to complete the sentence, “You would not live closer than _____ miles to a dairy.” The choices were ¼ mile, ½ mile, 1 mile, 3 miles, and greater than 3 miles. The responses for those choices were 24%, 14%, 24%, 16% and 22% respectively. We chose this question to be our proxy to rate residents’ favorable perception of dairy because of uniform response over the range of choices of distance. Those willing to live closer to a dairy were assumed to be more favorably predisposed towards dairy than those wanting to live greater than 3 miles from a dairy.

Cross tabs between distance from a dairy and other opinions about dairy listed in table 1 are presented in table 2. These results support our assumption that the distance preference from a dairy provides a proxy for measuring favorable perceptions of dairy. In table 3, a more detailed comparison between distance from a dairy and the opinion that a new dairy will cause water pollution is provided. The expected count for individuals who strongly agree that a new dairy will result in water pollution and live greater than 3 miles from a dairy was 22, but the actual count was 69. For those that strongly disagree that a new dairy will result in water pollution and would not live closer than ¼ mile, the expected count was 7 and the actual count

was 14. The Chi-square test indicates there are significant differences between the expected and actual count (<0.01).

Benefits of a new dairy

Survey participants were asked to evaluate potential benefits a new dairy industry would contribute to their community and how it might detract from the local quality of life. The “new jobs” benefit was considered the most likely benefit of a new dairy industry with 64% of residents agreeing or strongly agreeing. Expanded tax base had 58% of the residents agreeing this would be a benefit of a new dairy industry. Relating these two benefits to living close to a dairy, we found: Residents who believe a new dairy industry results in new jobs are more willing to live closer to a dairy, and residents who believe a new dairy industry results in an expanded tax base are more willing to live closer to a dairy (table 2).

Detractions of a new dairy

The detractions to local quality of life were hurts existing farmers, excess demand for water, water pollution, offensive odor, negative economic impact. Of these detractions, the offensive odors detraction was the item most agreed upon with 51% in agreement and 17% in disagreement. Water pollution and excess demand were the second and third leading detraction with 37% and 33%, respectively, in agreement. Relating these two problems to living close to a dairy, we found: Residents who believe a new dairy industry results in offensive odors are more willing to live farther from a dairy, residents who believe a new dairy industry results in water pollution are more willing to live farther from a dairy, and residents who believe a new dairy industry results in excess demand for water are more willing to live farther from a dairy (table 2).

Forcing a dairy to move and willingness to pay to keep dairy away

Only 11% of the residence agreed that a dairy should be forced to move if neighbors

object while 70% disagreed. Willingness to pay a one-time payment to keep a dairy away from a residence depended on the size of the dairy. Only 4% of Illinois residents were willing to pay to keep a 50 cow dairy from locating near their residence as compared to 18% willing to pay to keep a 500 cow dairy away and 24% were willing to pay to keep a 2500 cow dairy away. For the 2500 cow dairy, 6% were willing to pay \$5,000 or more compared to 3% for a 500 cow dairy and 0% for a 50 cow dairy. Relating a forced move and willingness to pay to keep a 2500 cow dairy away to living close to a dairy, we found: Residents who believe a new dairy should be forced to move are more willing to live farther from a dairy, and residents willing to pay to keep dairy away prefer to live farther from a dairy (table 2).

Opinions toward dairy regulation

Respondents were asked to state their agreement or disagreement to two policy statements concerning dairy regulation. (1) It is better that dairies be regulated by local authorities rather than state or federal authorities. (2) Existing regulations of dairy farms protect the water supply and air from pollution. In response to statement 1, opinions were mixed but favoring local authority with 41% or the residence in agreement, 36% neutral and 22% in disagreement. In response to statement 2, residents were unsure with 45% neutral and 37% in agreement. Relating opinions towards regulation to living close to a dairy, we found: Residents who prefer local regulation have no particular preference towards how close to live to a dairy, but residents who believe existing regulations of dairy protect from pollution are willing to live closer to a dairy (table 2).

Demographic differences in perceptions towards dairy

Tests for significant differences in perceptions toward dairy were performed using Chi-Square tests. The results are summarized in table 4. Significant differences at a level of 5% or

less are reported.

Differences in perceptions between dairy and non-dairy counties occurred for distance from dairy, offensive odors, water pollution, excess demand for water, new jobs, increase in tax base, dairy forced to move and local regulations. Residents for all those questions were significantly more in favor of dairy than residents of non-dairy counties. A comparison between dairy counties and non-dairy counties for the statement regarding how close you would live near to a dairy illustrates this bias favoring dairy (table 5). At ¼ mile, the expected count was 119 for the dairy counties compared to an actual count of 167, and the expected count was 140 for non-dairy counties compared to the actual count of 92 (table 5). At greater than 3 miles, the expected count was 110 for dairy counties compared to the actual count of 62, and the expected count was 129 for non-dairy compared to the actual count of 177 (table 5).

Other demographic comparison from table 4 indicate: Rural residents are significantly, (<0.01), more willing to live close to a dairy and not require a dairy to move than non-rural residents; similar not expecting water pollution to be a factor is a the less than 0.05 level of significance 3.

Illinois residents with a farm background significantly (<0.05 or <0.01) more willing to not expect water pollution, demand for water, increase taxes force a dairy to move , but do expect new jobs, regulations adequate and local regulations better than Illinois residents without a farm background, table 3.

The results in table 4 for Illinois residents who have lived near a dairy can be viewed in a similar manner. Especially note that Illinois residents who have had experience living near a dairy are significantly, (<0.01), more likely to be willing to live near a dairy than Illinois residents who have never lived near a dairy.

Also, in table 4, Illinois residents with a high income are significantly, (<0.01), more willing to make a one time payment to prevent a dairy of 500 or 2,500 cows from moving nearby. Results are similar for education level that is likely correlated with income.

Conclusions

The results suggest that residents from dairy counties or individuals with agricultural backgrounds, or individuals with experience living near a dairy are more supportive of dairy. Air and water quality are the major concerns associated with a new dairy among residents. Residents without a farm backgrounds or experience living near a dairy are less sure that 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 especially if they have higher incomes.

For those in Illinois desiring to sustain or expand milk production, the results suggest that an education program for residents is important. Those that were more knowledgeable of dairy and agriculture had a more favorable view. The education program would have to address the odor and water quality issues and what dairymen are doing to safeguard air and water. Obtaining growth in milk production from existing local producers will likely be more acceptable to the community than attracting new dairies from outside.

References

- Anderson, C. "Bellflower vote opposes mega-dairy." *The Pantagraph*, 2 November 2000.
- Coe, L. M. "Perceptions about Living Near an Illinois Dairy Farm." M.S. thesis, Southern Illinois University Carbondale, October 2003.
- FAPRI 2001 Agricultural Outlook "U.S. Livestock and Dairy": Internet site: <http://www.fapri.org> (Accessed June 10, 2002).
- Fuhrig, F. and N. Morris. "Californian rules out Christian County site." *The State-Journal Register*, 21 April 2000.
- NASS. "1997 Census of Agriculture." National Agricultural Statistics Service, U.S. Department of Agriculture (USDA). Internet site: <http://www.nass.usda.gov/census/census97/highlights/ag-state.htm> (Accessed 16 July 2002).
- NASS 2002. "USDA Published Estimate Data Base—U.S. and State Level data: for dairy. Internet Site: <http://www.nass.usda.gov:81/ipedb/> (Accessed November 20, 2002).
- USCB. "United States Census 2000." U.S. Census Bureau, United States Department of Commerce. Internet site: <http://quickfacts.census.gov/qfd/> (Accessed 12 December 2002).
- Williams, N. "Fourth-generation farm moving down the road." *Illinois AgriNews*. Vol. 27-No.34 p. C1. October 24, 2003.

Table 1. Questions to Measure Illinois Residents' Perceptions and Opinions about Dairy

Questions to measure perceptions of dairy as a neighbor:

Choose between living next to a dairy or an alternative neighbor or state no preference.
Alternative choices: car wash, church, coal mine, hog farm, subdivision, grain farm, high school, golf course and chemical plant.

You would not live closer than ___ miles to a dairy. Choices: ¼ mile, ½ mile, 1 mile, 3 miles, greater than 3 miles.

A dairy should be forced to move if neighbors object. Select: strongly agree, agree, neutral, disagree, and strongly disagree.

How much would you be willing to pay (one-time payment) to keep each keep each of these away from you (50 cow, 500 cow and 2,500 cow). Choices: \$0, \$500, \$1,000, \$5,000, and >\$5,000.

Questions to measure opinions of economic and environmental impact of dairy:

A new dairy industry would contribute these benefits to your community. Select degree of agreement or disagreement. Benefits to rate were: new jobs, expanded tax base, new business, new people and ideas, personally benefits you.

A new dairy industry would detract from the local quality of life in these ways. Select degree of agreement or disagreement. Detractions to rate were: negative economic impact, offensive odors, water pollution, excess demand for water, hurts existing farmers.

Questions to measure opinions toward policy:

It is better that dairies be regulated by local authorities rather than state or federal authorities. Select degree of agreement or disagreement.

Existing regulations of dairy farms protect the water supply and air from pollution. Select degree of agreement or disagreement.

Table 2. Relationship Between Distance Willing to Live Close to a Dairy and Other Opinions

	You wouldn't live closer to a dairy than					Total # obs
	1/4 mile	1/2 mile	1 Mile	3 miles	>3 miles	
(% of total responses)						
Residents who believe a new dairy industry results in new jobs are more willing to live close to a dairy.						
New jobs						
Strongly Agree	31	13	24	14	17	104
Agree	24	15	27	17	16	570
Neutral	24	15	21	17	22	245
Disagree	19	6	16	15	44	113
Strongly Disagree	15	4	7	7	67	27
Total	24	14	24	16	22	1059
Residents who believe a new dairy industry results in expanded tax base are more willing to live close to a dairy.						
Expanded tax base						
Strongly Agree	31	14	26	15	15	81
Agree	24	15	26	17	18	532
Neutral	25	13	23	17	22	339
Disagree	16	10	12	20	43	82
Strongly Disagree	20			5	75	20
Total	24	14	24	17	22	1054
Residents who believe a new dairy industry results in offensive odors are less willing to live close to a dairy.						
Offensive odors						
Strongly Agree	3	3	13	15	65	146
Agree	15	11	25	23	26	398
Neutral	29	18	30	14	9	334
Disagree	51	22	18	4	5	160
Strongly Disagree	58	15	8	8	12	26
Total	24	14	23	16	22	1064
Residents who believe a new dairy industry results in water pollution are less willing to live close to a dairy.						
Water pollution						
Strongly Agree	2	4	10	14	70	99
Agree	16	8	20	24	31	299
Neutral	25	16	29	17	14	405
Disagree	41	20	26	8	5	224
Strongly Disagree	48	21	17		14	29
Total	24	14	24	16	22	1056
Residents who believe a new dairy industry results in excess demand for water are less willing to live close to a dairy.						
Excess demand for water						
Strongly Agree	3	3	13	10	73	80
Agree	16	8	22	24	30	273
Neutral	23	15	27	16	18	422
Disagree	39	21	26	10	4	246
Strongly Disagree	60	17	10	3	10	30
Total	24	14	24	16	22	1051

Table 2. Continued

	You wouldn't live closer to a dairy than					Total # obs
	1/4 mile	1/2 mile	1 Mile	3 miles	>3 miles	
	(% of total responses)					
Residents who believe a new dairy should be forced to move are less willing to live close to a dairy.						
A dairy should be forced to move if neighbors object						
Strongly Agree	8	0	5	5	82	39
Agree	4	4	21	17	55	77
Neutral	12	10	20	28	30	202
Disagree	23	15	30	17	15	431
Strongly Disagree	42	19	21	9	8	304
Total	25	14	24	16	21	1053
Residents willing to pay to keep a dairy away prefer to live farther from a dairy.						
Willing to pay one-time payment to keep a 2500 cow dairy away.						
\$0	27	14	24	15	19	746
\$500	22	13	24	19	24	102
\$1,000	16	18	23	26	18	80
\$5,000	10	10	19	29	33	21
Over \$5,000	17	5	19	12	48	42
Total	25	14	24	17	21	991
Residents who believe existing regulations of dairy protect from pollution are willing to live closer to a dairy.						
Existing regulation of dairy protects air and water from pollution.						
Strongly Agree	32	16	23	12	16	73
Agree	28	17	26	16	13	307
Neutral	27	14	25	15	20	475
Disagree	14	9	18	25	34	152
Strongly Disagree	5	7	5	14	70	43
Total	24	14	24	16	22	1050
Residents who prefer local regulation have no particular preference towards how close to live to a dairy.						
Local regulations of dairy preferred to state or federal regulations.						
Strongly Agree	27	15	20	8	30	130
Agree	26	12	24	17	23	313
Neutral	25	16	24	15	20	382
Disagree	22	15	24	23	17	193
Strongly Disagree	16	9	24	18	33	45
Total	24	14	24	16	22	1063

Table 3. Relationship between Distance Willing to Live Close to a Dairy and a New Dairy Will Result in Water Pollution

A new dairy will result in water pollution		You wouldn't live closer to a dairy than					Total
		1/4 mile	1/2 mile	1 Mile	3 miles	Greater than 3 miles	
Strongly Agree	Count	2	4	10	14	69	99
	Expected Count	24.2	13.5	23.4	15.9	21.9	99.0
Agree	Count	47	25	61	72	94	299
	Expected Count	73.1	40.8	70.8	48.1	66.3	299.0
Neutral	Count	103	64	116	67	55	405
	Expected Count	98.9	55.2	95.9	65.2	89.7	405.0
Disagree	Count	92	45	58	17	12	224
	Expected Count	54.7	30.5	53.0	36.1	49.6	224.0
Strongly Disagree	Count	14	6	5	0	4	29
	Expected Count	7.1	4.0	6.9	4.7	6.4	29.0
Total	Count	258	144	250	170	234	1056
	Expected Count	258.0	144.0	250.0	170.0	234.0	1056.0

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	280.619(a)	16	.000
Likelihood Ratio	276.869	16	.000
Linear-by-Linear Association	211.592	1	.000
N of Valid Cases	1056		

a 2 cells (8.0%) have expected count less than 5. The minimum expected count is 3.95.

Table 4. Tests for Differences in Perceptions about Dairy by Demographic Groups Using Chi-Square for Illinois Residents

demographics	would not live closer than	offensive odors	water pollution	excess demand for water	new jobs	taxes increase	dairy forced to move	pay 50 cows	pay 500 cows	pay 2,500 cows	regulations adequate	local regulations
dairy/non-dairy ¹	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	NS	<0.01
rural/non-rural ²	<0.01	NS	<0.05	NS	NS	<0.01	<0.01	NS	NS	NS	NS	NS
farm background ³	NS	NS	<0.01	<0.05	<0.05	<0.05	<0.01	NS	NS	NS	<0.01	<0.01
lived near dairy ⁴	<0.01	<0.01	<0.01	<0.05	<0.01	NS	<0.01	NS	NS	NS	<0.01	NS
gender ⁵	<0.01	NS	NS	NS	NS	<0.05	NS	NS	NS	NS	NS	<0.01
political affiliation ⁶	<0.05	<0.05	<0.01	NS	NS	<0.05	<0.01	NS	NS	NS	NS	NS
annual income ⁷	NS	NS	NS	NS	NS	NS	NS	NS	<0.01	<0.01	NS	NS
education level	NS	NS	NS	<0.05	NS	<0.01	NS	<0.01	<0.01	<0.01	<0.05	<0.01

¹ dairy county residents biased for dairy

² rural residents biased for dairy

³ farm background residents biased for dairy

⁴ residents who ever lived by dairy biased for dairy

⁵ female residents biased against living near a dairy

⁶ Republicans, Democrats, and Independents differ in opinion

⁷ individuals with high income significantly more willing to pay to avoid dairy

Note: < 0.01. This means the factor is significant at 1%.

NS: not significant difference of opinion.

Table 5. Relationship between Distance Willing to Live Close to a Dairy and Dairy and Non-Dairy Counties

		<u>Dairy County</u>		Total	
		non-Dairy	Dairy		
You wouldn't live closer to a dairy than	1/4 mile	Count	92	167	259
		Expected Count	140.2	118.8	259
1/2 mile		Count	70	78	148
		Expected Count	80.1	67.9	148
1 mile		Count	132	124	256
		Expected Count	138.6	117.4	256
3 miles		Count	113	64	177
		Expected Count	95.8	81.2	177
greater than 3 miles		Count	177	62	239
		Expected Count	129.4	109.6	239
Total		Count	584	495	1079
		Expected Count	584.0	495.0	1079.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	84.534(a)	4	.000
Likelihood Ratio	86.806	4	.000
Linear-by-Linear Association	83.257	1	.000
N of Valid Cases	1079		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 67.90.