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2008 Michigan Dairy Industry Survey

by

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2008 Michigan Dairy Industry Survey

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The MSU Dairy Industry Evaluation Group is a subcommittee of the Dairy Team charged with developing, carrying out, analyzing, and reporting on the 2008 Dairy Industry Survey. The Evaluation Group consisted of Vera Bitsch, Ted Ferris, Kathy Lee, Mike McFadden, and Dean Ross.

Abstract

The Michigan State University (MSU) Dairy Team conducted an industry survey with the objectives of identifying and rating industry priorities. After holding discussion groups across the state, two questionnaires were developed and sent to 2,237 dairy farm owners and operators and 480 allied industry professionals in the state; 23.4% of the dairy farmers and 28.1% of the allied industry professionals returned questionnaires with useable data. This report summarizes respondents' ratings of industry issues, as well as education and knowledge needs. In addition, educational preferences, management practices, Internet use and access, demographic information, and farm characteristics are outlined.

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2008 Michigan Dairy Industry Survey Executive Summary

Michigan is a vibrant dairy state, ranking 7th in total U.S. milk and milk product sales according to the 2007 Census of Agriculture. Michigan dairy farms rank 4th in milk per cow and 1st in gross income per cow. In 2007, the Michigan State University Dairy Team decided to update its research and extension priorities based on stakeholder input. A Dairy Industry Evaluation Group was assembled, consisting of three Extension Dairy Educators, an animal scientist, and an agricultural economist, and charged with developing a comprehensive industry survey. In preparation of the survey, the Evaluation Group conducted discussion groups with dairy farmers and allied industry professionals in different regions of the state.

Survey questions were developed, asking farm owners and operators to rate issues considered important in the group discussions. The questionnaire consisted of two main sections, (1) industry issues grouped as priorities, concerns, and viability issues, and (2) research and education needs regarding herd management, environmental management, business management and finance, and human resource management. Additional sections addressed educational preferences, management practices, Internet use and access, demographic information, as well as farm size and farm characteristics.

A second questionnaire was developed for allied industry professionals. In addition to rating industry issues, they were asked to rate farm owners' and operators' educational needs, as well as their own educational needs. They also were asked to rate educational preferences and provide information on Internet use and access, as well as demographic data.

The farm owner and operator survey was mailed to all Grade A dairy farms in the state, based on a list obtained from the Michigan Department of Agriculture ($n_1=2,237$). Of the returned questionnaires, 523 could be used for this report. The allied industry professional survey was mailed to 480 industry professionals, based on a list developed by the Dairy Team. Of the returned allied industry questionnaires, 135 could be used for this report.

Most of the farm owner and operator respondents were male (91.3%), high school graduates (40.8%), and between 45 and 54 years of age (39.5%). Another 37.2% were 55 years of age and older. Of the farm owners and operators, 69% had been in their current position over 20 years. Optimistic about the future, 67% felt their farm would stay in business, either owned by themselves or the next generation, for more than 10 years. Farms with herd sizes of less than 50 cows were less likely to participate in the survey than larger farms. Accordingly, survey respondents' herds are larger than the average herd size of Michigan Agricultural Statistics.

Allied industry responses came from veterinarians (38.7%), nutritionists, herd management consultants, and feed company employees (34.8%), as well as lenders and financial consultants, equipment dealers and sales representatives, milk cooperative and processor employees, artificial insemination company employees, and government agency employees. Most respondents were male (88.1%), had 4-year college degrees (29.6%) or advanced degrees (45.9%), and were somewhat younger than the farm owner and operator sample (29.1% between 45 and 54 years of

age; 35.8% 55 years of age and older). Of the allied industry professionals, 45.2% had been in their current position over 20 years.

Industry Priorities and Education Needs

In the industry issues section, the items with highest ratings by farm owners and operators were the following. Not surprisingly, most other items also received high ratings, because the issues included in the questionnaire had been deemed as important to the dairy industry in the group discussions (Bitsch, Ferris, and Lee, 2009; Bitsch et al., 2008).

- Ensure continuation of Right to Farm program
- Increase legislators' knowledge of agriculture
- Food imports from less regulated countries
- Communicate to consumers about safety of milk products and technologies used
- Promote the value of the dairy industry in Michigan's economy
- Maintain adequate access to water resources for agriculture

The industry issues receiving the highest ratings by the allied industry professionals were the following.

- Dairy farmers demonstrating environmental stewardship
- Communicate to consumers about safety of milk products and technologies used
- Improving public understanding of animal welfare
- Ensure continuation of Right to Farm program
- Public image of agriculture
- Science-based environmental regulations

The farm owners and operators rated education and research needs highest in the herd management area. The three highest rated needs were "Effective strategies for getting cows pregnant," "Fresh cow management," and "Troubleshooting mastitis and high somatic cell count." The highest rated business management and finance needs were "Profit maximization strategies," "Financial management skills for dairy farmers," and "Calculating the cost of production." The highest rated environmental management needs were "Using manure as a fertilizer," "Current regulations and environmental laws," and "Building good relations with non-farm neighbors." The highest rated human resource management needs were "Communicating with family members involved in the farm," "Motivating employees," and "Ensuring job satisfaction and retention of employees." Human resource management needs were rated only as medium in importance by the average respondent.

For themselves, allied industry professionals perceived the highest educational needs in the areas of nutrition and reproduction. In general, allied industry professionals perceived educational needs for farm owners and operators to be higher than farmers did, and also indicated different priorities. They saw farmers' highest needs in human resource management, as well as in business management and finance. Larger farms (100 or more cows) also tended to rate these needs higher than smaller farms (less than 100 cows). The following education needs of dairy farmers received high average ratings by allied industry professionals (4.0 and above out of 5.0).

- Communicating with employees
- Use of records to improve financial decisions

- Calculating cost of production
- Profit maximization strategies
- Training employees
- Financial management skills for dairy farmers
- Communicating with family members involved in the farm
- Motivating employees
- Communication training for employees
- Fresh cow management
- Reducing the potential for manure runoff from fields, farms buildings, and lots
- Planning and financing business transfer to the next generation

Educational Preferences and Future Role of MSU Extension

Farm owners and operators see veterinarians and dairy nutrition consultants as their most valuable information sources. They also highly value other dairy farmers, the milk cooperative, and MSU Extension Educators. Allied industry professionals perceive industry and professional peers, as well as internal company or agency training and resources as their most valuable information sources. Other highly valued information sources for allied industry professionals are faculty from both MSU and other universities, industry and peer-reviewed journals, and professional associations.

Farm owners and operators showed a preference for printed education media, such as magazines, newspapers, and MSU Extension newsletters, including the Michigan Dairy Review. They also highly rated hands-on training, one-on-one education and consulting, and half-day seminars or workshops as educational methods. Full-day seminars or workshops received a medium rating. Computer-based methods, including DVDs, live presentations via the Internet, and other Internet-based material were rated low, as well as radio and TV programs. Of these, DVDs seem to have the most potential for future use, according to farmers' preferences.

Allied industry professionals showed a preference for face-to-face educational methods, including hands-on training, one-on-one education and consulting, as well as seminars and workshops. They also highly rated MSU Extension newsletters and the Michigan Dairy Review; but other magazines and newspapers received only a medium rating, similar to Internet-based material and DVDs. Allied industry professionals gave the lowest rating to radio and TV programs.

Farm owners and operators also rated their preference of different educational methods for farm employees. Highly preferred methods for employees were printed media, such as MSU Extension newsletters and the Michigan Dairy Review, as well as magazines and newspapers; other preferred methods were on-farm hands-on training, and half-day seminars or workshops. Off-farm hands-on training and training material on DVD received medium ratings. Full-day seminars or workshops, radio or TV programs, as well as Internet-based methods were rated low.

Farm owners and operators, as well as allied industry professionals perceive the most important role of MSU Extension for the next 10 years to be a source of educational material, followed by farm management advice, and on-farm consulting. Allied industry professionals also perceive the

training of agribusiness professionals as another important future role. Employee training, manager training, and leadership development generally were perceived as less important.

Use of Farm Management Tools and Practices, and Internet Use

Two different questions addressed the professionalism of farm management. Owner and operator respondents were asked about their use of six farm management tools. The most frequently used tools were accountants for taxes and business planning (85.9%) and a manure or nutrient management plan (64.5%). Respondents also were asked whether they routinely employed twelve management practices. The most frequently used routine practices were soil testing (91.5%), forage or feed analysis (86.8%), artificial insemination (79.7%), and standard operating procedures (67.8%).

Respondents from larger farms were more likely to report the use of any of the management tools (accountants, manure or nutrient management plans, Comprehensive Nutrient Management Plans, business plans, farm emergency plans, and mission statements) than respondents from smaller farms. Smaller farms were more likely to employ managed intensive grazing or organic farming practices than larger farms. Larger farms were more likely to routinely use soil testing, forage or feed analysis, artificial insemination, computerized herd records, estrus or ovulation synchronization, ration formulation via computer, and manure testing. Larger farms also used a management team approach (internal or external) more than twice as often as smaller farms. Only the use of standard operating procedures did not differ significantly between smaller and larger farms.

Almost a quarter of the farm owner and operator respondents indicated that they do not use the Internet (24.5%). Respondents from smaller farms are significantly less likely to use the Internet than respondents from larger farms (8.9% and 39.8% non-users, respectively). Of the Internet users, the majority rely on dial-up (53.7%). Only 14.5% of the farmers did not perceive any barriers to their Internet use. For the respondents who felt limited in their Internet use, the most frequently perceived barrier was time (59.7%). Only 5.2% of the allied industry professionals do not use the Internet. Of the allied industry users, 46.1% use DSL. Almost a third (29.6%) perceived no barriers to their Internet use. The most common barrier also was time (64.6%).

Conclusions

From an educators' standpoint, farm owners' and operators' responses show many opportunities for educational impacts. Providing educational opportunities for herd and environmental management skills and knowledge will draw participants from farms with differing herd sizes, including small farms. Larger farms expressed greater needs for business management and finance education and are particularly interested in human resource management education and training. However, smaller farms also should be able to use many of those skills. In addition, addressing several of the high priority industry issues could benefit from educational input. Despite the detailed overview of perceptions and preferences of dairy industry stakeholders gained from this survey, educators still need to carefully consider the broader context of educational goals and methods in program planning.

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2008 Michigan Dairy Industry Survey

Introduction

Michigan is a vibrant dairy state, ranking 7th in total U.S. milk and milk product sales according to the 2007 Census of Agriculture. Michigan dairy farmers rank 4th in milk per cow and 1st in gross income per cow. The Michigan State University Dairy Team is a self-directed team consisting of about 25 field educators and campus faculty, serving the Michigan dairy industry. The Dairy Team works with an industry advisory group, but had last collected formal stakeholder input 10 years ago.

In the spring of 2007, the Dairy Team decided to review its priorities based on stakeholder input. In addition to continuing to work closely with its advisory group, the Dairy Team decided to collect broad-based input through discussion groups in different regions of the state and through an industry survey. Discussion groups with dairy farmers, herdspersons, and next generation employees, as well as allied industry professionals were convened in November and December 2007 (Bitsch, Ferris, and Lee, 2009; Bitsch et al., 2008). Based on the results of these discussions, a survey questionnaire was developed, including industry opportunity, need, and concern items, which had been deemed important by the discussion groups. Additional survey items, also based on the group discussions, dealt with research and educational needs. Further survey questions addressed sources and media of educational information, along with demographic and business data.

Surveys were mailed to all Grade A dairy farms in Michigan, based on a list obtained from the Michigan Department of Agriculture ($n_1=2,237$). Forty-three questionnaires were returned blank for different reasons, such as recipients had retired or discontinued dairy farming. Of the returned questionnaires, 523 contained useable data from dairy farm owners, operators, or managers (23.4% response rate); albeit not all questions were answered by each respondent.

A similar questionnaire was developed to be sent to allied industry personnel. Extension Dairy Educators were asked for a list of industry professionals serving dairy farmers and the dairy industry in their areas. These lists were combined and state level professionals were added. Surveys were sent to veterinarians, feed company employees (sales representative and nutritionists), independent dairy nutritionists, agricultural lenders, milking equipment dealers, artificial insemination sales representatives, livestock auction employees, milk cooperative and processor field representatives, Michigan Department of Agriculture personnel (Dairy, Environmental Stewardship, and Animal Industry Divisions), and other professionals ($n_2=480$). Of the 163 surveys returned by allied industry professionals, 135 could be used for analysis (28.1% response rate).

This report summarizes the responses of the dairy farm owners and operators and the allied industry professionals who participated in the survey, their opinions of priorities with respect to industry needs and concerns and their perception of key education, training, and research needs in the areas of herd management, environmental management, farm business management and finance, and human resource management. The report also highlights educational priorities and perspectives of both groups and their Internet use.

Demographic Data

Most dairy farm owners and operators who responded to the survey were male (91.3%). They were well educated, with only 7.1% with a less than grade 12 education, 40.8% with a high school degree, 37.0% had post high school technical training, some college, a 2-year college degree, or an agricultural technology degree, and another 14.8% had a 4-year college degree or an advanced degree (Table 1). The largest age group of survey respondents was the 45 to 54 group (39.5%), with 23.2% of respondents in the younger age groups, 26.5% in the 55 to 64 age group and 10.7% in the 65 and over age group. Compared to the 2007 Census of Agriculture, a similar amount of operators who responded to the survey fell into the younger age group (under 45) and into the 55 to 64 age group, but fewer fell into the over 65 group. More survey respondents fell into the age groups 45 to 54 (Table 2). These differences are statistically significant.

Table 1. Education levels of operator survey respondents (Operators) and allied industry respondents (Allied)

Education Level	Operators/Percent	Allied/Percent
Less than grade 12	7.1	0.0
High school graduate	40.8	2.2
Post high school technical training	6.4	4.4
Some college	15.4	7.4
2 year college degree/Ag tech degree	15.2	9.6
4 year college degree	12.5	29.6
Advanced college degree/ DVM	2.3	45.9

Table 2. Age groups comparison of Michigan dairy farms by North American Industry Classification (Census) with operator survey respondents (Operators) and allied industry respondents (Allied)

Age Group	Census*/Percent	Operators/Percent	Allied/Percent
Under 25	0.5	1.2	0.0
25 to 34	7.4	6.7	20.1
35 to 44	18.0	15.4	14.9
45 to 54	32.3	39.5	29.1
55 to 64	25.9	26.5	27.6
65 and over	15.9	10.7	8.2

*Source: 2007 Census of Agriculture

Dairy farm owners and operators who responded to the survey were also very experienced. 31.0% have been in their current position 20 years or less, whereas 69.0% have been in their current position over 20 years (Table 3). Overall the operator survey respondents were optimistic about the future of dairy farming in Michigan. Asked how long they felt their farm would be in business, either owned by them or the next generation, 11.1% of the respondents answered “5 years or less,” 21.8% answered “6 to 10 years,” 20.0% answered “11-20 years” and 47.0% answered “more than 20 years.”

The largest group of allied industry respondents consisted of veterinarians (38.7%). The second largest group consisted of nutritionists, herd management consultants, and feed company employees (34.8%). Other respondents included lenders and financial consultants, equipment dealers and sales representatives, milk cooperative and processor employees, artificial insemination company employees, and government agency employees. Of the allied industry professionals who provided demographic information, 88.1% were male, 11.9% were female. Only 14% had less than a 2-year college degree and 9.6% had accomplished a 2-year college degree or an agricultural technology degree. 29.6% had a 4-year college degree and 45.9% had an advanced college degree or a DVM degree (Table 1). The two largest age groups were 45 to 54 years old (29.1%) and 55 to 64 years old (27.6%); 35.0% were less than 45 years old and 8.2% were 65 years of age or older (Table 2). Overall, allied industry respondents were somewhat younger than the dairy farm owners and operators. Accordingly, allied industry respondents have held their current positions on average for less time than the dairy farm owners and operators. 13.4% had been in their current position for 5 years or less; 20.0% had been in their current positions between 6 to 10 years; and 21.5% had been in their current position between 11 and 20 years. Similarly to farm owners and operators, over 20 years was the largest group with 45.2% of the allied industry respondents (Table 3). Table 4 shows the number of farms and cows with which the allied industry respondents work.

Table 3. Experience in current position of operator survey respondents (Operators) and allied industry respondents (Allied)

Experience in Current Position	Operators/Percent	Allied/Percent
Under 1 year	0.2	1.5
1-5 years	5.2	11.9
6-10 years	8.0	20.0
11-15 years	8.6	9.6
16-20 years	9.0	11.9
Over 20 years	69.0	45.2

Table 4. Allied industry respondents (Allied) by farms and number of cows worked with

Number of Farms Worked With	Allied/Percent	Number of Cows Worked With	Allied/Percent
10 or less	11.1	1,000 or less	10.2
11-25	21.5	1,001-5,000	26.0
26-50	20.7	5,001-10,000	12.6
51-100	23.0	10,001-20,000	21.3
More than 100	23.7	More than 20,000	29.9

Dairy farm owners and operators participating in the survey were larger, based upon number of cows, than the average Michigan dairy farm, according to the Michigan Agricultural Statistics 2007-8 (Table 5). Fewer dairy farm operators with herd sizes of less than 50 cows participated in the survey compared to other herd size groups. A reason for this difference is the inclusion of manufacturing herds in the Michigan Agricultural Statistics, which had been excluded from the survey mailing list.

Table 5. Herd size groups comparison of Michigan dairy operations (MAS) with survey respondents (Survey)

Number of Cows	MAS*/Number	MAS*/Percent	Survey/Number	Survey/Percent
1-49	1,140	43.8	110	21.0
50-99	630	24.2	154	29.4
100-199	465	17.9	125	23.9
200-499	260	10.0	94	18.0
500+	105	4.0	40	7.6
Total	2,600	100.0	519	100.0

*Source: Michigan Agricultural Statistics (MAS) 2007-8

In conclusion, the survey respondents' herd sizes and age groups differ slightly from the available statistical information on Michigan dairy farmers. Although these differences are statistically significant, the survey provides an adequate representation of Michigan dairy farming for most purposes. However, users of the survey results need to determine whether the survey respondents can be taken as a suitable representation of Michigan's dairy owners and operators for their purposes. In particular, readers need to exercise caution in applying survey results to very small dairy herds, because those are under-represented.

Industry Priorities and Concerns

Dairy farm owners and operators and allied industry professionals were asked to rate a battery of industry priorities and concerns items. This section highlights the opinions of both groups and also compares their perspectives. Although there are a number of striking differences between the ratings of farm owners and operators and the ratings of allied industry professionals, which are described below, it should be noted that both samples' ratings follow very similar patterns. Often times, both samples rate the same items high or low, respectively, within each group of items. Therefore, while both groups have different perspectives in many areas, their opinions on the relative importance of items within each category are rather similar (see Appendix A).

Survey participants were asked to rate twelve items according to the priority each topic should receive from the Michigan dairy industry, on a scale from 1 (very low priority) to 5 (very high priority) (Table 6). Owner and operator respondents gave the highest priority to five items with median ratings of 5. Median ratings of 5 signify that at least 50% of the respondents gave these items the highest priority rating. Another six items received median ratings of 4, indicating that survey respondents gave them a high priority. Median ratings of 4 signify that at least 50% of respondents gave these items a high or a very high priority rating. Allied industry professionals rated two industry priority items with median ratings of 5 (Table 7). These two items ("Communicate to consumers about safety of milk products and technologies used," "Ensure continuation of Right to Farm program") also received median ratings of 5 by farm owners and operators. Nine industry priority items received median ratings of 4 by the allied industry respondents.

Table 6. Industry priority items (median and mean ratings¹) – farm owners and operators

Priority items with median ratings of 5 (very high priority)	Mean
Ensure continuation of Right to Farm program	4.60
Increase legislators' knowledge of agriculture	4.52
Communicate to consumers about safety of milk products and technologies used	4.42
Promote the value of the dairy industry in Michigan's economy	4.36
Maintain adequate access to water resources for agriculture	4.34
Priority items with median ratings of 4 (high priority)	
Increase dairy product promotion activities and education, especially targeted to youth	4.18
Inform the public about current farming practices	3.93
Work with government to enhance plans to deal with potential foreign animal disease outbreaks	3.90
Work with legislators to fund dairy industry initiatives	3.74
Ensure continuation of Cooperatives Working Together (CWT) program	3.69
Promote availability of career opportunities in agriculture	3.58
Priority items with median ratings of 3 (medium priority)	
Develop more leaders within the dairy industry	3.46

Table 7. Industry priority items (median and mean ratings¹) – allied industry professionals

Priority items with median ratings of 5 (very high priority)	Mean
Communicate to consumers about safety of milk products and technologies used	4.39
Ensure continuation of Right to Farm program	4.30*
Priority items with median ratings of 4 (high priority)	
Increase legislators' knowledge of agriculture	4.40
Promote the value of the dairy industry in Michigan's economy	4.31
Maintain adequate access to water resources for agriculture	4.17
Inform the public about current farming practices	4.07
Increase dairy product promotion activities and education, especially targeted to youth	3.99*
Promote availability of career opportunities in agriculture	3.82*
Develop more leaders within the dairy industry	3.75*
Work with government to enhance plans to deal with potential foreign animal disease outbreaks	3.63*
Work with legislators to fund dairy industry initiatives	3.60
Priority items with median ratings of 3 (medium priority)	
Ensure continuation of Cooperatives Working Together (CWT) program	3.28*

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Overall, differences between the mean ratings of dairy farm owners and operators and of allied industry professionals for industry priority items were small, but several were significant (Table

¹The median is calculated by ordering each respondent's rating from the lowest to the highest and taking the central rating. Half of all ratings are below the median and half of all ratings are above the median. The mean or average is calculated by adding all respondents' ratings and dividing the sum by the number of respondents per item. If opinions are symmetrically distributed in the sample, median and mean are similar. For non-homogeneous samples, samples with outliers, or skewed distributions median and mean differ. In the latter case, the median is a more suitable representation of the sample than the mean.

7). The largest rating difference occurred for “Ensure continuation of Cooperatives Working Together (CWT) program,” which was rated higher by farm owners. Owners and operators also rated “Ensure continuation of Right to Farm program,” “Work with government to enhance plans to deal with potential foreign animal disease outbreaks,” and “Increase dairy promotion activities and education, especially targeted to youth” significantly higher than allied industry professionals. The industry professionals rated “Develop more leaders within the dairy industry” and “Promote availability of career opportunities in agriculture” significantly higher than owners and operators.

Table 8. Industry viability items (median and mean ratings¹) – farm owners and operators

Viability items with median ratings of 4 (important)	Mean
Taking advantage of globalization by increasing dairy exports	4.28
New dairy products to increase milk utilization	4.22
Increasing legislators’ understanding of the tradeoff between the cost and benefits of complying with regulations	4.19
Dairy farmers demonstrating environmental stewardship	4.17
Improving public understanding of animal welfare	4.17
Dairy farmer involvement in the legislative process and representation in regulation development	4.16
Dairy industry being proactive on environmental issues, including working actively with government agencies	3.96
Methods to improve disease resistance	3.89
Greater effort and funding for food safety and inspection programs including imported foods	3.88
Improving production efficiencies	3.85
Adopting alternative energy technologies	3.81
Science-based environmental regulations	3.75
Consumer/public acceptance of scientific information	3.72
Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law	3.54
Traceability of agricultural products to their origin to improve food safety	3.54
Methods to process manure, including renewable fuel (e.g., methane digesters)	3.50
Viability items with median ratings of 3 (medium important)	
Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers	3.45
Assessment of dairy farming’s impact on environmental quality	3.38
Methods to reduce odor and air pollutants	3.35
Survey what consumers think about food products and the way they are produced	3.34
Implementing animal welfare assessments on farms	3.01

Survey participants were also asked to rate the importance of 21 items to the viability of the dairy industry in Michigan (Table 8). On a scale from 1 (not important) to 5 (very important), dairy farm owner and operator respondents gave high importance to 16 items with median ratings of 4. As with the priority items, allied industry professionals rated the industry viability items similarly (Table 9) to farm owners and operators. Two items received 4.5 median ratings by the allied industry professionals (“Dairy farmers demonstrating environmental stewardship,”

“Improving public understanding of animal welfare”). Seventeen items received median ratings of 4.

Table 9. Industry viability items (median and mean ratings¹) – allied industry professionals

Viability items with median ratings of 4.5 (very important)	Mean
Dairy farmers demonstrating environmental stewardship	4.43*
Improving public understanding of animal welfare	4.31
Viability items with median ratings of 4 (important)	
Science-based environmental regulations	4.34*
Dairy industry being proactive on environmental issues, including working actively with government agencies	4.22*
Taking advantage of globalization by increasing dairy exports	4.20
Increasing legislators’ understanding of the tradeoff between the cost and benefits of complying with regulations	4.11
Consumer/public acceptance of scientific information	4.10*
Dairy farmer involvement in the legislative process and representation in regulation development	4.05
Methods to process manure, including renewable fuel (e.g., methane digesters)	3.93*
New dairy products to increase milk utilization	3.92*
Greater effort and funding for food safety and inspection programs including imported foods	3.87
Improving production efficiencies	3.85
Methods to improve disease resistance	3.75
Traceability of agricultural products to their origin to improve food safety	3.69
Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers	3.66*
Assessment of dairy farming’s impact on environmental quality	3.66*
Methods to reduce odor and air pollutants	3.64*
Adopting alternative energy technologies	3.60
Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law	3.57
Viability items with median ratings of 3 (medium important)	
Survey what consumers think about food products and the way they are produced	3.35
Implementing animal welfare assessments on farms	3.19

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Significant differences between the mean ratings of farm owners and operators and of allied industry professionals occurred for nine items. The item with the largest difference in mean ratings was “Science-based environmental regulations,” rated higher by allied industry respondents. Other items rated significantly higher by industry professionals included “Methods to process manure, including renewable fuel,” “Consumer/public acceptance of scientific information,” “Methods to reduce odor and air pollutants,” “Assessment of dairy farming’s impact on environmental quality,” “Dairy farmers demonstrating environmental stewardship,” “Dairy industry being proactive on environmental issues, including working actively with government agencies,” and “Timely access to trained Comprehensive Nutrient Management Plan

(CNMP) service providers.” Farm owners and operators rated “New dairy products to increase milk utilization” significantly higher than industry professionals.

Table 10. Industry concern items (median and mean ratings¹) – farm owners and operators

Concern items with median ratings of 5 (great concern)	Mean
Food imports from less regulated countries	4.45
Concern items with median ratings of 4 (high concern)	
Public image of agriculture	4.17
Consumer interpretation of dairy product label, e.g., hormone-free, antibiotic-free, rBST-free	3.95
Availability of dairy veterinarians	3.93
Farm transfer to the next generation	3.87
Successfully eradicating TB in Michigan	3.84
Loss of farm land due to urban encroachment	3.82
Availability and market/consumers’ acceptance of production technologies, e.g., rBST, antibiotics	3.75
Planning for and meeting changing state and federal environmental regulations	3.70
Farm business growth to improve quality of life	3.52
Agro-terrorism and bio-terrorism	3.48
Concern items with median ratings of 3 (medium concern)	
Availability of farm labor	3.17
Immigration legislation	3.15

Table 11. Industry concern items (median and mean ratings¹) – allied industry professionals

Concern items with median ratings of 4 (high concern)	Mean
Public image of agriculture	4.34*
Food imports from less regulated countries	4.19*
Availability and market/consumers’ acceptance of production technologies, e.g., rBST, antibiotics	4.05*
Consumer interpretation of dairy product label, e.g., hormone-free, antibiotic-free, rBST-free	4.01
Availability of dairy veterinarians	3.93
Farm transfer to the next generation	3.93
Loss of farm land due to urban encroachment	3.89
Successfully eradicating TB in Michigan	3.80
Immigration legislation	3.76*
Farmers planning for and meeting changing state and federal environmental regulations	3.69
Availability of farm labor	3.59*
Farm business growth to improve quality of life	3.48
Concern items with median ratings of 3.5 (medium high concern)	
Agro-terrorism and bio-terrorism	3.45

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

In addition, survey participants were asked to rate their concerns for the dairy industry. A concern is a potential threat to the industry or the individual farm. On a scale from 1 (not a concern) to 5 (great concern) one of 13 items rated received the highest median rating of 5 by dairy farm owners and operators. Ten items received median ratings of 4 (Table 10). Industry concern items were also rated similarly by allied industry professionals (Table 11). Twelve out of 13 industry concern items received median ratings of 4 by the professionals, indicating that “Food imports from less regulated countries” was rated as less a concern by allied industry professional and, on the other hand “Immigration legislation” and “Availability of farm labor” were rated as higher concerns by the allied industry respondents compared to dairy farm owners and operators. These differences are significant. In addition, allied industry professionals rated “Availability and market/consumers’ acceptance of production technologies” and “Public image of agriculture” significantly higher than dairy farm owners and operators. One item (Agro-terrorism and bio-terrorism) received only a median rating of 3.5 by allied industry professionals.

Tables 6-11 cluster the industry priorities and concerns by their median rating; the mean ratings are included in the tables for comparison purposes. However, small differences between some means should not be interpreted as a ranking of these items. If the reader chooses to set priorities based on farm owner’s and operator’s opinions, small differences should be interpreted as ties.

Education and Knowledge/Research Needs

In the largest section of the questionnaire, survey participants were asked about their perceptions regarding education, training, and research needs in the areas of environmental management, herd management, farm business management and finance, and human resource management. Farm owners and operators were asked how much knowledge, education, or training they desired for each item. Allied industry professionals were asked how much knowledge, education, or training they believed dairy producers and managers needed. In addition, allied industry professionals were asked how much knowledge, education, or training they desired for themselves.

In considering the results for the farm owners and operators it is important to note that specific groups of farmers may have different research and education priorities and needs than reported here for the total of the dairy farm owners and operators who responded to the survey. For example, management practices for organic production did appear to be of low interest to survey respondents overall. These are, however, likely to be of high importance to organic dairy producers (5.5% of the respondents). Another example are human resource management practices, which were of mid-level interest to the average survey participant, but are likely more important to farmers employing a larger number of people. Differences in priorities and opinions based on farm and respondent characteristics are discussed in the following section.

Asked how much knowledge, education, or training they desire on different topics, farm owner and operator respondents overall gave lower ratings to their research and education needs compared to the industry priorities and concerns. Many of these industry items are more likely to be properly addressed through collective action of industry participants and stakeholders, whereas research and education needs can, at least in part, be addressed by Michigan State University and Michigan State University Extension. In general, allied industry professional

respondents rated most education and knowledge items higher than farm owners and operators. Both groups rated the herd management items most similar. For environmental management items, business management and finance items, and human resource management items the differences between both samples were increasingly larger.

Herd Management Education Needs

Dairy farm owner and operator respondents were most likely to rate education and research needs within the herd management category highly. On a scale from 1 (none) to 5 (a lot), farm owner and operator respondents rated 14 out of 26 herd management items with median ratings of 4, indicating significant general needs in these areas (Table 12).

Table 12. Herd management education needs (median and mean ratings¹) – farm owners and operators

Herd management items with median ratings of 4 (high need)	Mean
Effective strategies for getting cows pregnant	3.89
Fresh cow management	3.78
Troubleshooting mastitis and high somatic cell count	3.74
Quality, digestibility, and production of feeds	3.71
Foot health and lameness	3.71
Increasing cow longevity	3.70
Best management practices for vaccinations	3.69
Lactating cow management	3.68
Calf management	3.67
Impact of heifer raising methods on performance	3.61
Choosing alternative feeds based on feeding value and profitability	3.58
Identify bottlenecks to improving herd performance	3.50
Reducing the use of antibiotics through best practices	3.50
Dry cow management	3.49
Herd management items with median ratings of 3 (medium need)	
Cow comfort, stall and bedding systems	3.46
Impact of stocking density and facility design on production, reproduction, and health	3.35
Using bio-fuel byproduct feeds	3.31
Record analysis and monitoring production, health, and reproduction	3.26
Managing culling rates	3.25
Feeding to reduce nutrient in manure	3.20
Impacts of crossbreeding and inbreeding	3.04
Farm biosecurity protocols for farm visitors and purchased animals	3.01
Strategies to use sexed semen and economic implications	2.73
Herd management items with median ratings of 2 (low need)	
Grazing management practices and economics	2.52
Robotic milking systems and their management	2.14
Herd management items with median ratings of 1 (no need)	
Management practices for organic production	2.00

With one exception (“Lactating cow management”), allied industry professionals rated the herd management knowledge, education, and training needs of dairy producers and managers higher than farm owners and operators did (Table 13). Twenty-one of the 26 items received median ratings of 4 by the industry professionals. For 19 out of the 26 items, rating differences between means were significant. The average difference between the ratings by both groups was 0.29. The highest differences in ratings were received by “Farm biosecurity protocol for farm visitors and purchased animals,” “Impact of stocking density and facility design on production, reproduction, and health,” and “Record analysis and monitoring production, health, and reproduction.” With the exception of biosecurity protocols, which was rated one of the bottom five items by farm owners and operators, the items receiving the lowest ratings were the same for both samples.

Table 13. Herd management education needs (median and mean ratings¹) – allied industry professionals

Herd management items with median ratings of 4 (high need)	Mean
Fresh cow management	4.03*
Calf management	3.99*
Effective strategies for getting cows pregnant	3.98
Foot health and lameness	3.95*
Troubleshooting mastitis and high somatic cell count	3.95*
Best management practices for vaccinations	3.93*
Cow comfort, stall and bedding systems	3.93*
Impact of stocking density and facility design on production, reproduction, and health	3.93*
Impact of heifer raising methods on performance	3.90*
Identify bottlenecks to improving herd performance	3.88*
Record analysis and monitoring production, health, and reproduction	3.85*
Reducing the use of antibiotics through best practices	3.84*
Quality, digestibility, and production of feeds	3.79
Increasing cow longevity	3.72
Dry cow management	3.71*
Farm biosecurity protocols for farm visitors and purchased animals	3.69*
Choosing alternative feeds based on feeding value and profitability	3.66
Managing culling rates	3.65*
Lactating cow management	3.64
Using bio-fuel byproduct feeds	3.57*
Feeding to reduce nutrients in manure	3.56*
Herd management items with median ratings of 3 (medium need)	
Impacts of crossbreeding and inbreeding	3.20
Strategies to use sexed semen and economic implications	3.15*
Grazing management practices and economics	2.69
Herd management items with median ratings of 2.5	
Robotic milking systems and their management	2.51*
Herd management items with median ratings of 2 (low need)	
Management practices for organic production	2.36*

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Environmental Management Education Needs

In the environmental management area, farm owner and operator respondents rated two out of six items with median ratings of 4, indicating significant general needs (Table 14). These items were rated higher by allied industry professionals than by farm owners and operators (Table 15). All six items received median ratings of 4 by the allied industry respondents, indicating a high perceived education need. Farm owners and operators saw only medium education needs for four of these six topics. On average, allied industry professional rated these needs by 0.46 higher than farm owners and operators. The difference was smallest and not significant for “Using manure as a fertilizer (e.g., application rates).” All other differences were significant. “Reducing the potential for manure runoff from fields, farm buildings, and lots” was the highest rated item for the allied industry professionals and showed the largest difference in ratings between the two samples.

Table 14. Environmental management education needs (median and mean ratings¹) – farm owners and operators

Environmental management items with median ratings of 4 (high need)	Mean
Using manure as a fertilizer (e.g., application rates)	3.64
Current regulations and environmental laws	3.53
Environmental management items with median ratings of 3 (medium need)	
Building good relations with non-farm neighbors	3.38
Reducing the potential for manure runoff from fields, farm buildings, and lots	3.33
Michigan’s Agriculture Environmental Assurance Program (MAEAP)	3.24
Handling dead animal carcasses, including composting	3.24

Table 15. Environmental management education needs (median and mean ratings¹) – allied industry professionals

Environmental management items with median ratings of 4 (high need)	Mean
Reducing the potential for manure runoff from fields, farm buildings, and lots	4.01*
Building good relations with non-farm neighbors	3.96*
Current regulations and environmental laws	3.92*
Using manure as a fertilizer (e.g., application rates)	3.82
Michigan’s Agriculture Environmental Assurance Program (MAEAP)	3.73*
Handling dead animal carcasses, including composting	3.70*

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Farm Business Management and Finance Education Needs

In the farm business management and finance area (20 items), dairy farm owners and operators rated six items with median ratings of 4, indicating significant general needs (Table 16). These needs were again rated higher by allied industry professionals than by farm owners and operators (Table 17). Sixteen out of the 20 items received a median rating of 4 by the allied industry respondents, signifying high educational needs of dairy producers and managers on these topics

as perceived by the allied industry respondents. The same five items were rated top five by both groups, albeit given more importance by the allied industry professionals.

Table 16. Farm business management and finance education needs (median and mean ratings¹) – farm owners and operators

Farm business management and finance items with median ratings of 4 (high need)	Mean
Profit maximization strategies	3.67
Financial management skills for dairy farmers	3.57
Calculating cost of production	3.53
Use of records to improve financial decisions	3.50
Planning and financing business transfer to the next generation	3.45
General farm business management	3.44
Farm business management and finance items with median ratings of 3 (medium need)	
Using insurance and other methods to protect assets	3.24
Evaluation of farm enterprises	3.20
Planning for business growth	3.15
Understanding the legal system and dealing with lawsuits	3.13
Contracting farm inputs	3.11
Use of financial ratios and benchmarks	3.09
Milk marketing and price risk management	3.08
Effectively working with consultants	2.97
Use of partial budgeting	2.97
Effectively working with the on-farm management team	2.93
Evaluation of alternative legal business structures	2.87
Evaluation of niche market opportunities	2.82
Leadership development and training	2.80
Contractual agreements with service providers	2.79

Except for one item (“Using insurance and other methods to protect assets”), differences between the two groups were highly significant. On average, allied industry professionals rated these needs 0.61 higher than farm owners and operators. The largest rating differences in this area included “Effectively working with the on-farm management team,” “Planning for business growth,” “Leadership development and training,” “Use of financial ratios and benchmarks,” “Use of partial budgeting,” and “Use of records to improve financial decisions.”

Table 17. Farm business management and finance education needs (median and mean ratings¹) – allied industry professionals

Farm business management and finance items with median ratings of 4 (high need)	Mean
Use of records to improve financial decisions	4.24*
Calculating cost of production	4.20*
Profit maximization strategies	4.20*
Financial management skills for dairy farmers	4.17*
Planning and financing business transfer to the next generation	4.00*
Planning for business growth	3.98*
General farm business management	3.96*
Effectively working with the on-farm management team	3.92*
Use of financial ratios and benchmarks	3.86*
Contracting farm inputs	3.79*
Use of partial budgeting	3.73*
Evaluation of farm enterprises	3.70*
Milk marketing and price risk management	3.64*
Effectively working with consultants	3.61*
Leadership development and training	3.59*
Contractual agreements with service providers	3.44*
Farm business management and finance items with median ratings of 3 (medium need)	
Using insurance and other methods to protect assets	3.40
Understanding the legal system and dealing with lawsuits	3.37*
Evaluation of niche market opportunities	3.34*
Evaluation of alternative legal business structures	3.34*

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Human Resource Management Education Needs

In the human resource management area (16 items), dairy farm owners and operators rated no items with a median rating of 4 or above. Eleven items received median ratings of 3 (Table 18). Allied industry professionals rated 15 items reflecting the human resource management knowledge, education, and training needs of dairy producers and managers (Table 19). One item (English language skills for employees) was left out of their questionnaire. Allied industry respondents rated all human resource management items with median ratings of 4, signifying that they saw high needs for knowledge, education, and training for dairy producers and managers in this area. The differences between the average ratings of allied industry professionals and the farm owners and operators were most pronounced for the human resource management area. Allied industry professionals rated human resource management needs on average 1.26 higher than the farm owners and operators and all rating differences were very highly significant. These differences may occur because many smaller farms do not hire a significant amount of labor while allied industry professionals work with a wide variety of farms and see human resource management from a broader industry perspective.

Table 18. Human resource management education needs (median and mean ratings¹) – farm owners and operators

Human resource management items with median ratings of 3 (medium need)	Mean
Communicating with family members involved in the farm	3.37
Motivating employees	3.07
Ensuring job satisfaction and retention of employees	3.05
Communicating with employees	2.93
Developing effective incentives for employees	2.90
Training employees	2.84
Hiring quality employees	2.81
Developing wage/benefit package for employees	2.78
Communication training for employees	2.75
Terminating employees and avoiding legal liability	2.72
Human resource management (in general)	2.58
Human resource management items with median ratings of 1.5 (very low need)	
Immigration legislation and background	2.20
Human resource management items with median ratings of 1 (no need)	
English language skills for employees	2.19
Managing Latino labor, cultural understanding	2.13
Training materials in Spanish for employees	2.06
Communicating dairy tasks in Spanish	2.01

Table 19. Human resource management education needs (median and mean ratings¹) – allied industry professionals

Human resource management items with median ratings of 4 (high need)	Mean
Communicating with employees	4.35*
Training employees	4.19*
Communicating with family members involved in the farm	4.14*
Motivating employees	4.12*
Communication training for employees	4.04*
Ensuring job satisfaction and retention of employees	3.98*
Managing Latino labor, cultural understanding	3.92*
General human resource management	3.89*
Hiring quality employees	3.86*
Developing effective incentives for employees	3.85*
Training materials in Spanish for employees	3.80*
Communicating dairy tasks in Spanish	3.77*
Developing wage/benefit package for employees	3.77*
Terminating employees and avoiding legal liability	3.70*
Immigration legislation and background	3.66*

*Differences between means of dairy farm owners and operators and of allied industry professionals significant at the 5% level or better (t-Test)

Given that dairy farms that are hiring employees often times work with employees for whom English is a second language, the lack of general interest in issues related to immigrant

employees and non-English speakers by dairy farm owners and operators may seem surprising. However, it is unlikely that language and cultural differences are not perceived as a problem or that there are already sufficient resources available to deal with them. The difference between the median and the mean ratings indicates a skewed distribution of opinions or a non-homogeneous sample. It can be assumed that farmers with hired labor rate these items differently than farmers who do not hire employees. By the same token farmers who hire many employees can be expected to rate human resource management needs differently than farmers who hire only a few employees. Evidence supporting these assumptions is presented in the following section.

The difference in ratings between allied industry professionals and dairy farm owners and operators was smallest for “Communicating with family members involved in the farm,” which was the highest rated item in this area for the farm owners and operators. The differences were largest for the four items relating to immigrant labor (“Managing Latino labor and cultural understanding,” “Communicating dairy tasks in Spanish,” “Training materials in Spanish for employees,” and “Immigration legislation and background”) and for “Communicating with employees,” which was the highest rated item in this category for the allied industry professionals.

Allied Industry Professionals Educational Needs

Whereas Tables 13, 15, 17, and 19 depict allied industry professional respondents perception of knowledge, education, and training needs of dairy producers and managers, the professionals were also asked how much knowledge, education, or training they desired for themselves. On a scale from 1, indicating no need for education and training in that area, to 5, indicating a lot of need for education and training in that area, allied industry professionals rated most educational items with median ratings of 4, with the exception of genetics, the lowest rated item, and human resource management (Table 20).

Table 20. Knowledge, education, and training needs of allied industry professionals (median and mean ratings¹)

Items with median ratings of 4 (high need)	Mean
Nutrition	3.91
Reproduction	3.82
Herd records	3.74
Animal health	3.74
Business and financial management	3.72
Udder health and milk quality	3.64
Environmental regulation and management	3.56
Items with median ratings of 3 (medium need)	
Human resource management	3.22
Genetics	3.06

Differences in Priorities and Opinions Depending on Characteristics

This section presents differences in priorities and opinions of dairy farm owner and operator respondents depending on farm characteristics, management systems, and respondents’

characteristics (t-Test, 5%-level or better). In interpreting these differences, it should be noted that although age and education show no significant relationship, there was an unexpected interaction between farm size, age, and education. Respondents in the 55 and older age group were more likely to report smaller herd sizes. Respondents in the more formally educated group were more likely to report larger herd sizes. In addition, respondents in the younger age group and more formally educated were more likely to report larger farm sizes. For the older age group, the difference between education groups is not significant, indicating that more education did not make a difference in farm size for older respondents (Table 21).

Table 21. Farm Size, Age, and Education (in Percent)

Age Group	Under 55		55 and Older	
Education ^a	High School+	Higher Education	High school+	Higher Education
Smaller Farm ^b	53.2	38.0	65.6	34.4
Larger Farm ^c	46.8	62.0	55.1	44.9

^aHigh School+ includes respondents with less than a grade 12 education, high school graduates, and post high school technical training; higher education includes individuals with any type of college education and advanced degrees (see also Table 1)

^bSmaller farms are farms with less than 100 cows

^cLarger farms are farms with 100 or more cows

Herd Size

All industry needs and educational priority questions were tested for significant differences in opinions between respondents from farms with less than 100 cows and respondents from farms with 100 or more cows. In the industry needs section, several items showed significant differences by farm size. The following items were seen as more important by respondents from larger farms (see Appendix B, Table B-1).

- Availability of farm labor
- Immigration legislation
- Availability and market/consumers' acceptance of production technologies
- Science-based environmental regulations
- Consumer/public acceptance of scientific information
- Consumer interpretation of dairy product labels
- Dairy industry being proactive on environmental issues, including working actively with government agencies
- Methods to process manure, including renewable fuel
- Planning for and meeting changing state and federal environmental regulations
- Public image of agriculture
- Improving public understanding of animal welfare
- Improving production efficiencies
- Methods to reduce odor and air pollutants
- Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law
- Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers
- Taking advantage of globalization by increasing dairy exports

- Inform the public about current farming practices
- Develop more leaders within the dairy industry
- Dairy farmers demonstrating environmental stewardship
- Communicate to consumers about safety of milk products and technologies used
- Promote the value of the dairy industry in Michigan's economy

Educational priorities reflect similar tendencies as the industry needs (see Appendix B, Table B-2). In the herd management category, respondents from smaller farms indicated significantly higher needs for knowledge, education, and training in two areas. These differences were large, but also expected, because smaller farms are more likely to practice grazing and/or organic production.

- Grazing management practices and economics
- Management practices for organic production

Respondents from larger farms indicated significantly higher needs for knowledge, education, and training on the following herd management topics.

- Strategies to use sexed semen and economic implications
- Identify bottlenecks to improving herd performance
- Managing culling rates
- Impact of stocking density and facility design on production, reproduction, and health
- Effective strategies for getting cows pregnant
- Robotic milking systems and their management
- Foot health and lameness
- Record analysis and monitoring production, health, and reproduction
- Increasing cow longevity
- Impact of heifer raising methods on performance
- Fresh cow management
- Feeding to reduce nutrients in manure
- Calf management

With respect to environmental management, respondents from larger farms indicated significantly greater needs for knowledge, education, and training on the following topics.

- Current regulations and environmental laws
- Michigan's Agriculture Environmental Assurance Program (MAEAP)

Respondents from larger farms saw farm business management and finance topics as higher needs than respondents from smaller farms. Respondents from larger farms indicated significantly higher needs for knowledge, education, and training for 18 of the 20 topics in this category. The first five items showed some of the largest differences between respondents from larger and smaller farms for all educational items. The perception of these items by respondents from larger farms seems more like the perception of allied industry respondents than that of respondents from smaller farms.

- Effectively working with the on-farm management team
- Contracting farm inputs
- Leadership development and training

- Planning for business growth
- Contractual agreements with service providers
- Evaluation of alternative legal business structures
- Effectively working with consultants
- Evaluation of farm enterprises
- Planning and financing business transfer to the next generation
- Profit maximization strategies
- Use of financial ratios and benchmarks
- Milk marketing and price risk management
- Use of records to improve financial decisions
- Financial management skills for dairy farmers
- Understanding the legal system and dealing with lawsuits
- General farm business management
- Using insurance and other methods to protect assets
- Use of partial budgeting

Even larger differences between respondents from smaller and from larger farms were expected for the human resource management category and, indeed, respondents from larger farms perceived much higher needs for knowledge, education, and training (see Appendix B, Table B-3), similarly to allied industry respondents. The sole item where this difference is small and not significant is “Communicating with family members involved in the farm.”

Age Groups

Age is a less prominent factor in priorities and educational needs than farm size. Most farm owner and operator respondents were between 45 to 54 years old (see Table 2). Therefore two different age splits were tested, at 45 and at 55 years old. Results are only reported for the less than 55 years old versus 55 and older groups.

With respect to industry issues, farm owner and operator respondents 55 years of age and older indicated a significantly higher priority or a greater concern than younger respondents about the following topics.

- Successfully eradicating TB in Michigan
- Greater effort and funding for food safety and inspection programs including imported foods
- Work with government to enhance plans to deal with potential foreign animal disease outbreaks
- Methods to reduce odor and air pollutants
- Agro-terrorism and bio-terrorism
- Traceability of agricultural products to their origin to improve food safety
- Availability of dairy veterinarians
- Planning for and meeting changing state and federal environmental regulations

Regarding herd management younger respondents perceived higher needs of knowledge, education, or training on the following topic.

- Robotic milking systems and their management

Older respondents perceived higher needs of knowledge, education, or training on the following topic.

- Farm biosecurity protocols for farm visitors and purchased animals

In the farm business management category age was a significant factor for three topics. Younger respondents perceived a higher need for knowledge, education, or training on the following topic.

- Planning for business growth

Older respondents perceived a higher need for knowledge, education, or training on the following topics.

- Understanding the legal system and dealing with lawsuits
- Using insurance and other methods to protect assets

Age was also a factor for five topics in the human resource management category. Younger respondents perceived a higher need for knowledge, education, or training on the following topics.

- Communicating dairy tasks in Spanish
- Hiring quality employees
- Communication training for employees
- Training materials in Spanish for employees

Older respondents perceived a higher need for knowledge, education, or training on the following topic.

- Communicating with family members involved in the farm

Education Groups

Similar to age, education is a less prominent factor in priorities and educational needs than farm size. Most farm owner and operator respondents indicated a high school degree as their highest educational accomplishment (Table 1). Respondents were split into two educational groups. One group combines individuals with less than a grade 12 education, high school graduates, and post high school technical training. The other group combines all types of college education and advanced degrees.

With respect to industry issues, respondents with more formal education put a higher priority on or were more concerned about the following topics.

- Science-based environmental regulations
- Dairy industry being proactive on environmental issues, including working actively with government agencies
- Loss of farm land due to urban encroachment
- Communicate to consumers about safety of milk products and technologies used
- Increasing legislators' understanding of the tradeoff between the cost and benefits of complying with regulations

- Increase legislators' knowledge of agriculture

Individuals with less formal education were more concerned about the following topics.

- Farm business growth to improve quality of life
- Successfully eradicating TB in Michigan

The herd management category showed most differences based on the formal education of respondents. Respondents with less formal educational accomplishments perceived a significantly higher need for knowledge, education, or training on many herd management topics than more educated respondents. In particular they rated the following topics higher.

- Calf management
- Dry cow management
- Management practices for organic production
- Grazing management practices and economics
- Farm biosecurity protocols for farm visitors and purchased animals
- Cow comfort, stall and bedding systems
- Lactating cow management
- Managing culling rates
- Impact of crossbreeding and inbreeding
- Fresh cow management

Only one topic was rated significantly higher by more formally educated respondents.

- Strategies to use sexed semen and economic implications

In the farm business management and finance category the groups based on formal education differed significantly with respect to two topics. Respondents with less formal education rated each of these topics higher than those with more formal education.

- Using insurance and other methods to protect assets
- Calculating cost of production

Finally, education was a factor in six human resource management topics. Respondents with less formal education perceived a higher need for knowledge, education, or training on the following topic.

- Communicating with family members involved on the farm.

Respondents with more formal education perceived a higher need for knowledge, education, or training on the following topics.

- Training materials in Spanish for employees
- Immigration legislation and background
- Communicating dairy tasks in Spanish
- English language skills for employees
- Managing Latino labor, cultural understanding

Sources of Educational Materials, Education Methods, and Expectations for Michigan State University Extension (MSUE)

Farm owners and operators and allied industry professionals differ substantially with respect to where they get their information. Therefore, both samples were provided with different choices of potential information sources, albeit with some overlap. On a scale from 1, indicating no value of this information source, to 5, indicating a very valuable information source, veterinarians were the most valuable source of information with a median rating of 5 for farm owners and operators. Median ratings of 4, indicating a high value, were received by dairy nutrition consultants, other dairy farmers, milk cooperatives, and MSU Extension educators. Median ratings of 3, indicating a medium value, were received by industry sponsored meetings, MSU campus faculty and extension specialists, Michigan Farm Bureau, dairy management consultants, and other universities' faculty or extension (Table 22).

Table 22. Farm operator respondents' ratings¹ of the value of information sources

Information Source	Median	Mean
Veterinarians	5.0	4.36
Dairy nutrition consultants	4.0	4.10
Other dairy farmers	4.0	3.83
Milk cooperative	4.0	3.69
MSU Extension Agent/Educator	4.0	3.47
Industry-sponsored meetings	3.0	3.36
MSU campus faculty/Extension specialist	3.0	3.17
Michigan Farm Bureau	3.0	3.07
Dairy management consultants	3.0	3.07
Other universities' faculty/extension	3.0	2.72

Allied industry professionals place the highest value on industry or professional peers, internal company or agency training and resources, other universities' faculty or extension, industry and peer reviewed journals, professional associations, and MSU campus faculty and extension specialists; all with median ratings of 4. A median rating of 3 was given to MSU Extension educators (Table 23).

Table 23. Allied industry respondents' ratings¹ of the value of information sources

Information Source	Median	Mean
Industry/professional peers	4.0	4.17
Internal company/agency training and resources	4.0	4.17
Other universities' faculty/extension	4.0	4.04
Industry and peer reviewed journals	4.0	3.96
Professional associations	4.0	3.92
MSU campus faculty/Extension specialist	4.0	3.84
MSU Extension Agent/Educator	3.0	3.70

Both farm owners and operators and allied industry professionals were also asked about the value of different formats of presenting educational information to them and about how they preferred to receive educational information (Table 24). Owners and operators and allied

industry professionals differed with regard to how they perceived different formats of presenting educational information. Farm owners and operators rated information in magazines and newspapers, in general, as well as, MSUE newsletters and the Michigan Dairy Review highest (median ratings of 4). They also highly valued hands-on training, one-on-one education or consulting, and half-day seminars or workshops (median ratings of 4). Full-day seminars or workshops were perceived as less valuable (median rating of 3).

Allied industry professionals rated hands-on training and one-on-one education or consulting highest, followed by full-day and half-day seminars or workshops, and then MSUE newsletters and Michigan Dairy Review, and magazines and newspapers (median ratings of 4). The allied industry professionals saw median values of 3 in live presentations over the Internet, training material on DVD, and other Internet-based material. They saw a low value in radio or TV programs (median rating of 2). Farmers concurred with respect to radio or TV programs, but also saw a low value in other Internet-based material and training material on DVD (median ratings of 2). Live presentations via the Internet received a median rating of 1 by farmers.

Table 24. Perceived Value (V) of and Preference (P) for Educational Methods¹

Methods	Farm Owners and Operators				Allied Industry Professionals			
	Median		Mean		Median		Mean	
	V	P	V	P	V	P	V	P
Magazines and newspapers	4.0	4.0	3.99	3.74	4.0	3.0	3.51	3.24
MSUE newsletters and Michigan Dairy Review	4.0	4.0	3.60	3.72	4.0	4.0	3.63	3.56
Hands-on training	4.0	4.0	3.42	3.40	4.0	4.0	4.52	3.90
One-on-one education or consulting	4.0	4.0	3.33	3.29	4.0	4.0	4.45	3.69
Half-day seminars or workshops	4.0	4.0	3.30	3.30	4.0	4.0	4.07	3.84
Full-day seminars or workshops	3.0	3.0	3.04	2.58	4.0	4.0	4.10	3.65
Other Internet-based material	2.0	2.0	2.42	2.24	3.0	3.0	3.46	2.97
Radio or TV programs	2.0	2.0	2.33	2.31	2.0	2.0	2.41	1.92
Training material on DVD	2.0	2.5	2.18	2.60	3.0	3.0	3.63	2.92
Live presentations via the Internet	1.0	1.0	1.73	1.93	3.0	3.0	3.79	2.58

The relatively low ratings of computer-based educational methods, in particular by farm owners and operators, are not likely to be caused by lack of availability of the hardware, because respondents had the option to answer “not applicable” to these questions (for more information on hardware availability and Internet use see the following section). Of the farm owners and operators, 36.3% chose the not-applicable option for live presentations via the Internet, 25.2% for other Internet-based material, and 30.8% for training material on DVD. Of the allied industry professionals, 25.9% chose the not-applicable option for live presentations via the Internet, 11.9% for other Internet-based material, and 20.0% for training material on DVD.

In addition to rating the value of different educational formats and their preferences for themselves, farm owners and operators were also asked to rate educational methods for farm employees. Respondents rated only one item, on-farm hands-on training, as of high value for

employee education (median rating of 4). Four items received median ratings of 3, magazines and newspapers, MSUE newsletters and Michigan Dairy Review, half-day seminars or workshops, and off-farm hands-on training. Three items received median ratings of 2, full-day seminars or workshops, training material on DVD, and radio or TV programs. Finally, two items received median ratings of 1, other Internet-based material and live presentations via the Internet (Table 25). With respect to preferences for future employee education, all ratings are higher. Four items received median ratings of 4, on-farm hands-on training, magazines and newspapers, MSUE newsletters and Michigan Dairy Review, and half-day seminars or workshops. Two items received median ratings of 3, off-farm hands-on training and training material on DVD. Three items received median ratings of 2, full-day seminars or workshops, radio or TV programs, and other Internet-based material. One item, live presentations via the Internet, received a median rating of 1 (Table 25).

Table 25. Perceived Value (V) of and Preference (P) for Educational Methods for Farm Employees¹

Methods	Farm Owners and Operators			
	Median		Mean	
	V	P	V	P
On-farm hands-on training	4.0	4.0	3.43	3.47
Magazines and newspapers	3.0	4.0	3.23	3.35
MSUE newsletters and Michigan Dairy Review	3.0	4.0	2.80	3.72
Half-day seminars or workshops	3.0	4.0	2.69	3.24
Off-farm hands-on training	3.0	3.0	2.69	2.98
Full-day seminars or workshops	2.0	2.0	2.45	2.58
Training material on DVD	2.0	3.0	2.29	2.88
Radio or TV programs	2.0	2.0	2.05	2.24
Other Internet-based material	1.0	2.0	1.93	2.19
Live presentations via the Internet	1.0	1.0	1.58	2.00

Table 26. Preferred MSU Extension Roles in the next 10 years (top three choices)

MSU Extension Roles	Dairy Farm Owners and Operators/Percent ^a	Allied Industry Professionals/Percent ^a
Source of educational material	73.2	70.4
Farm management advice	60.4	52.6
On-farm consulting	51.1	39.3
Training agribusiness professionals	29.3	39.3
Employee training	17.2	26.7
Manager training	16.4	29.6
Leadership development	12.8	20.7
Other ^b	5.4	7.4

^aChoices add up to more than 100%, because respondents were asked to pick their top three choices.

^bThe most common answer by allied industry professionals in the “other” category was for MSUE to educate the public and the consumer about agriculture, production methods, and product quality. Allied industry professionals also brought up this role in the open-ended questions (see Appendix C). Farm respondents did not show a trend in responding to the “other” option. Several farm respondents did, however, mention education of the public and/or government and being an advocate for farmers in the open-ended questions (see Appendix D).

Farm owners and operators, as well as allied industry professionals were asked which roles they would like MSU Extension to play in the Michigan dairy industry in the next 10 years (Table 26). Both groups saw MSU Extension’s most important role in being a source of educational material, followed by providing farm management advice, and on-farm consulting. For the allied industry professionals, training agribusiness professionals tied for the top third choice. The latter may become a more important role for MSU Extension in the future.

Internet Use and Barriers to Internet Use

Almost a quarter of the farm owners and operators (24.5%) did not use the Internet. Respondents from smaller farms are significantly less likely to use the Internet than respondents from larger farms; 39.8% of the smaller farmers reported to not use the Internet, but only 8.9% of the larger farmers. A majority of farm owners and operators who used the Internet relied on dial-up (53.7%) (Table 27). Other types of Internet connections used include cell phone or wireless providers (19.0%), DSL (18.7%), satellite (16.2%), and cable (6.3%)². Of the farm respondents, 11.7% stated that no Internet connection was available to them. Asked about barriers that limit their use of the Internet (Table 28), the most frequent answers were time (59.7%), speed of connection (32.9%), lack of understanding (29.5%), no desire (26.6%), and cost (16.8%)². Of the farm respondents, 14.5% reported no barriers to their use of the Internet. Other answering options available were each chosen by few respondents; including no connection (8.7%), lack of hardware (6.3%), don’t trust the information (6.3%), availability of information (5.4%), and other (3.4%)².

Table 27. Internet Connections Used

Connection Type	Farm Owners and Operators/ Percent of Users ^a	Allied Industry Professionals/ Percent of Users ^a
Dial-up	53.7	24.2
Cell phone, wireless provider	19.0	31.3
DSL	18.7	46.1
Satellite	16.2	14.1
Cable company	6.3	23.4

^aOf the farm owners and operators, 24.5% are non-users; of the allied industry professionals, 5.2% are non users; percentages are based on users only (multiple answers)

Very few allied industry respondents did not use the Internet (5.2%). Of the Internet users, most used DSL (46.1%), followed by cell phone or wireless providers (31.3%), dial-up (24.2%), cable (23.4%), and satellite (14.1%)² (Table 27). Of the allied industry respondents, 29.6% reported no barriers to Internet use. Allied industry respondents who perceived barriers most often named time (64.6%), followed by speed of connection (29.2%), no desire, cost, and lack of understanding (17.7% each)² (Table 28). Other answering options available were each chosen by few respondents, including no connection (5.2%), don’t trust the information (5.2%), availability of information (3.1%), lack of hardware (1.0%), and other (2.1%)².

²Multiple answers

Table 28. Common Barriers to Internet Use^a

Connection Type	Farm Owners and Operators/ Percent of Respondents with Barriers	Allied Industry Professionals/ Percent of Respondents with Barriers
Time	59.7	64.6
Speed of connection	32.9	29.2
Lack of understanding	29.5	17.7
No desire	26.3	17.7
Cost	16.8	17.7

^aOf the farm owners and operators, 14.5% perceived no barriers to their Internet use; of the allied industry professionals, 29.6% perceived no barriers to their Internet use; percentages are respondents with perceived barriers only (multiple answers)

Use of Farm Management Tools and Practices

The farm owners and operators survey included two questions on farm management tools and practices used. Accountants were the most frequently used tool out of a list of six with 83.9%, followed by manure or nutrient management plans with 64.5%, business plans with 41.4%, and Comprehensive Nutrient Management Plans (CNMP) with 40.4% (Table 29). Farms with 100 or more cows are significantly more likely than smaller farms to use each of these management tools. Almost 60% of farms with 100 or more cows use CNMPs, while only slightly over 20% of the smaller farms use them. Almost 80% of the larger farms use manure or nutrient management plans but only about half of the smaller farms. About half of the larger farms use business plans, but only about a third of the smaller farms (Table 29).

Table 29. Farm Owners' and Operators' Use of Management Tools

Management Tool	Use/Percent of Farms	Use/Percent of Farms with Less Than 100 Cows	Use/Percent of Farms with 100 or More Cows
Accountant (taxes, business planning)	83.9	74.0	93.7*
Manure/Nutrient management plan	64.5	49.6	79.4*
Business plan	41.4	32.4	50.4*
Comprehensive Nutrient Management Plan (CNMP)	40.4	21.2	59.3*
Farm emergency plan	33.2	26.0	40.5*
Mission statement	25.7	14.2	37.3*

*Farms with 100 or more cows significantly different from smaller farms (Pearson Chi Square significant at 5% level or better)

In addition farm owners and operators were given a choice among twelve management practices, regarding their routine use on the farm. Seven of these practices were routinely used by more than half of the respondents. The most frequently used practices were soil testing (91.5%), forage or feed analysis (86.8%) and artificial insemination (79.7%). Standard operating procedures were used by 67.8% of the respondents. Computerized herd records were used by 59.3%, estrus or ovulation synchronization by 57.5%, and ration formulation via computer by 56.1% (Table 30).

Farms with less than 100 cows were significantly more likely to use managed intensive grazing or organic practices than larger farms. Larger farms were more likely to routinely use each of the other management practices and, with the exception of standard operating procedures, these differences were significant. The largest difference occurred in manure testing, where only a little over 20% of the smaller farms, but over 66% of the larger farms practiced it routinely (Table 30). As observed by MacDonald et al. (2007) for U.S. dairy farming, larger farms are more likely to invest in technologies and practices to address potential problems with manure and nutrient surplus.

Table 30. Farm Owners' and Operators' Routine Use of Management Practices

Management Tool	Use/Percent of Farms	Use/Percent of Farms with Less Than 100 Cows	Use/Percent of Farms with 100 or More Cows
Soil testing	91.5	86.2	96.9*
Forage/feed analysis	86.8	76.7	96.9*
Artificial insemination (AI)	79.7	74.5	84.9*
Standard operating procedures	67.8	66.5	69.0
Computerized herd records	59.3	40.8	77.5*
Estrus/ovulation synchronization	57.5	41.3	73.4*
Ration formulation via computer	56.1	38.5	73.3*
Manure testing	43.8	20.6	66.4*
On-farm management team	40.1	26.5	53.5*
External management team	18.9	10.0	27.8*
Managed intensive grazing	18.0	28.4	7.7*
Organic farming practices	5.5	9.8	1.2*

*Farms with 100 or more cows significantly different from smaller farms (Pearson Chi Square significant at 5% level or better)

Large differences in routine use of practices were also found for computerized herd records with over three quarters of the larger farms using them and less than 41% of the smaller farms; over 73% of the larger farms and 38.5% of the smaller farms used ration formulation via computer; and over 73% of the larger farms and 41.3% of the smaller farms used estrus or ovulation synchronization. Further, larger farms are more than twice as likely to use a team approach to management. An on-farm management team was used by 53.5% and an external management team was used by 27.8% of the larger farms. Only 26.5% of the smaller farms used an on-farm management team and 10% used an external management team.

Conclusions and Implications

The opinions of dairy farm owners and operators regarding industry priorities (Table 6) and viability issues of the dairy industry in Michigan (Table 8) have different implications for different industry groups and decision makers. Collective action may be required on many of the priority and viability items, as well as the industry concerns (Table 10). Although industry groups will set their priorities based on their values and roles within the industry, farmers' priorities are an important input into the decision making process. In particular, items with median ratings of 5 are given a very high priority by more than 50% of the survey respondents.

Considering that survey responses often have a tendency towards mid-level ratings, this is a very strong statement by the participating farm owners and operators.

Industry priorities, viability items, and concerns with median ratings of 4 are given high or very high importance by more than 50% of the survey respondents. Even items with median ratings of 3 cannot be discounted as unimportant, as they are still rated of mid-level, high or very high importance by at least 50% of the survey respondents. However, in setting action priorities the items with the higher ratings should probably be addressed in a more immediate fashion and allocated more resources.

In view of the farm owners' and operators' responses, there are also numerous education and research opportunities to be addressed in all categories included in the survey (Table 12, 14, 16, and 18). The category receiving high median ratings in the education and research section by farm owners and operators most frequently was herd management (Table 12). However, administrators, educators, and researchers will have to consider specific topics carefully when setting priorities. The number of highly rated herd management topics does not indicate that topics in other categories would not be important to the long-term sustainability of dairy farming in Michigan and to the individual success of dairy farm operators. Although some educational needs were rated as less important than others by the average respondent, e.g., grazing management practices and economics (median: 2) and management practices for organic production (median 1), farmers that use grazing (18.0% of respondents) or organic practices (5.5% of respondents) still have valid needs to be addressed. Because smaller farms are more likely to use these practices (Table 30), offering such programs would be one way to address the needs of smaller farms, as was requested in write-in responses (Appendices C and D).

Differences in priorities regarding industry issues and educational needs, as well as opinions towards research priorities were to be expected based on farm and operator characteristics. Of these characteristics, farm size is the most important. For example, concerns related to employees, such as the availability of farm labor and immigration legislation are more important on larger farms (median 4) than on smaller farms (median 3). Although larger farmers that hire many non-family employees are more likely to be severely impacted by unfavorable immigration legislation, all farms with any employees will be impacted by a tighter labor market and rising wages as a probable result.

With regard to educational needs, owners and operators from larger farms perceived higher needs for farm business management and finance, as well as human resource management skills than smaller farms. For larger farms, the most important needs in these categories included the following (median 4).

- Profit maximization strategies
- Financial management skills for dairy farms
- Use of financial records to improve financial decisions
- Planning and financing business transfer to next generation
- Motivating employees
- Calculating cost of production
- Ensuring job satisfaction and retention of employees
- General farm business management

- Communicating with employees
- Planning for business growth
- Training employees
- Communicating with family members involved in the farm
- Contracting farm inputs
- Developing effective incentives for employees
- Hiring quality employees

In addition, all other training needs in the human resource management category were perceived as of medium importance by respondents from larger farms.

Despite a tendency for industry priorities and concern ratings of farm owners and operators and allied industry professionals to show similar patterns (see Appendix A), 20 out of 46 items were rated significantly different by both groups. Items rated significantly higher and therefore viewed as more important by dairy farm owners and operators included the following.

- Ensure continuation of Right to Farm program
- Food imports from less regulated countries
- New dairy products to increase milk utilization
- Increase dairy promotion activities and education, especially targeted to youth
- Work with government to enhance plans to deal with potential foreign animal disease outbreaks
- Ensure continuation of Cooperatives Working Together (CWT) program

Items rated significantly higher by allied industry professionals included the following.

- Dairy farmers demonstrating environmental stewardship
- Science-based environmental regulations
- Public image of agriculture
- Dairy industry being proactive on environmental issues, including working actively with government agencies
- Consumer/public acceptance of scientific information
- Availability and market/consumers' acceptance of production technologies
- Methods to process manure, including renewable fuel
- Promote availability of career opportunities in agriculture
- Immigration legislation
- Develop more leaders within the dairy industry
- Assessment of dairy farming's impact on environmental quality
- Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers
- Methods to reduce odor and air pollutants
- Availability of farm labor

With respect to dairy producers' and managers' knowledge, education and training needs, allied industry professionals rated most items higher than farm owners and operators. Both groups rated the herd management items most similar. For environmental management items, business management and finance items, and human resource management items the differences between

both groups are increasingly larger. Allied industry professionals work with multiple farms with different management styles and needs and conclude overall that there is a high need for knowledge or training with respect to many aspects of dairy farming beyond herd management.

How should educational content be delivered? Traditional delivery methods, including printed material and face-to-face interaction (one-on-one consulting, hands-on training, and workshops) were still the preferred methods for many respondents (Table 24). Computer-based methods were seen with reservation by most participants, although allied industry professionals gave these methods medium ratings (median 3) and are, therefore, more likely to use them in the future. Farmers perceived little value in computer-based methods, least of all live presentations via the Internet. This response may, in part, be due to lack of familiarity. Probably more importantly, a majority of farm respondents are not able to reap the benefits of live Internet presentation, because they access the Internet via dial-up. For training farm employees, delivery methods were evaluated even more conservatively than for farm owners and operators, with on-farm hands-on training being most valued. However, potential future improvements for employee training were perceived with respect to MSUE newsletters and the Michigan Dairy Review, half-day seminars or workshops, training material on DVD. Some respondents even perceived a future potential for Internet presentation (Table 25). If delivery methods that were not highly valued at present are to be used in future educational delivery successfully, more marketing efforts will be necessary to ensure participation.

MSU Extension's most important roles in the coming ten years were perceived to be the source of educational material, farm management advice, and on-farm consulting. In conclusion, MSU Extension's roles for the future of the dairy industry were perceived as the continuation of the highly valued contributions of the past. An additional role was suggested in respondents' write-in comments to open-ended questions (Appendices C and D), the role of educating the public about agriculture, production methods, and product quality.

References

Bitsch, V., T. Ferris, K. Lee 2009. "Extension teams collecting industry-specific stakeholder input," *Journal of Extension (JOE)*, 47(June, 3), Article 3RIB5, <http://www.joe.org/joe/2009june/rb5.php>.

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Appendix A
Comparison of Owner and Operator and Allied Industry Professionals Respondents on Industry Issues and Educational Priorities³

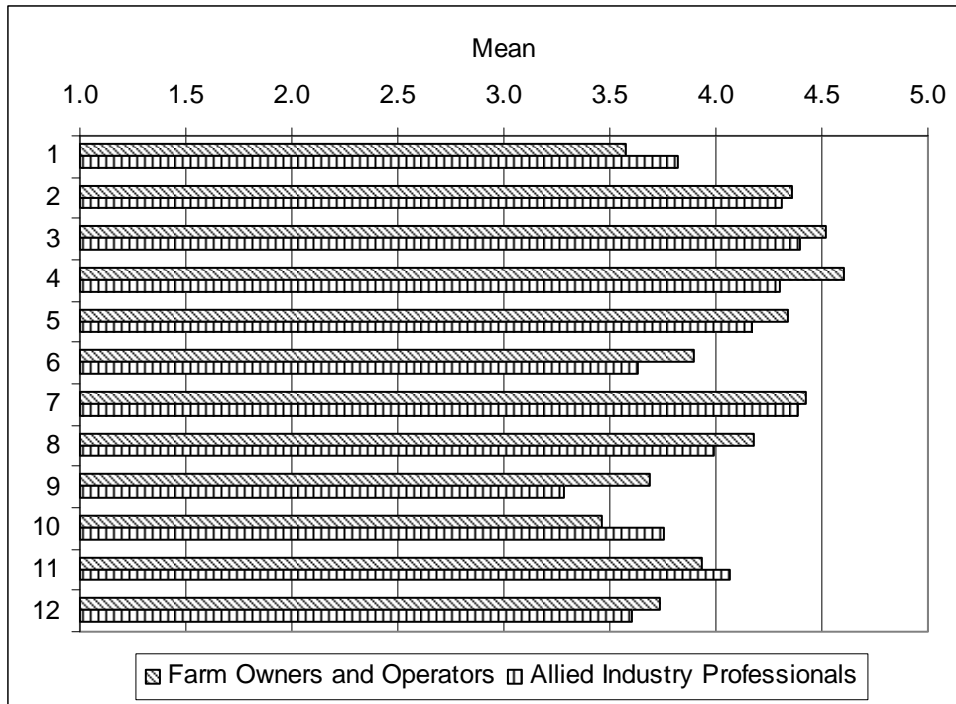


Figure A-1. Industry Priority Items

³The numbers in the figures refer to the items on the farm owner and operator questionnaire (Appendix E). Per question, 1 refers to item a, 2 refers to item b, etc.

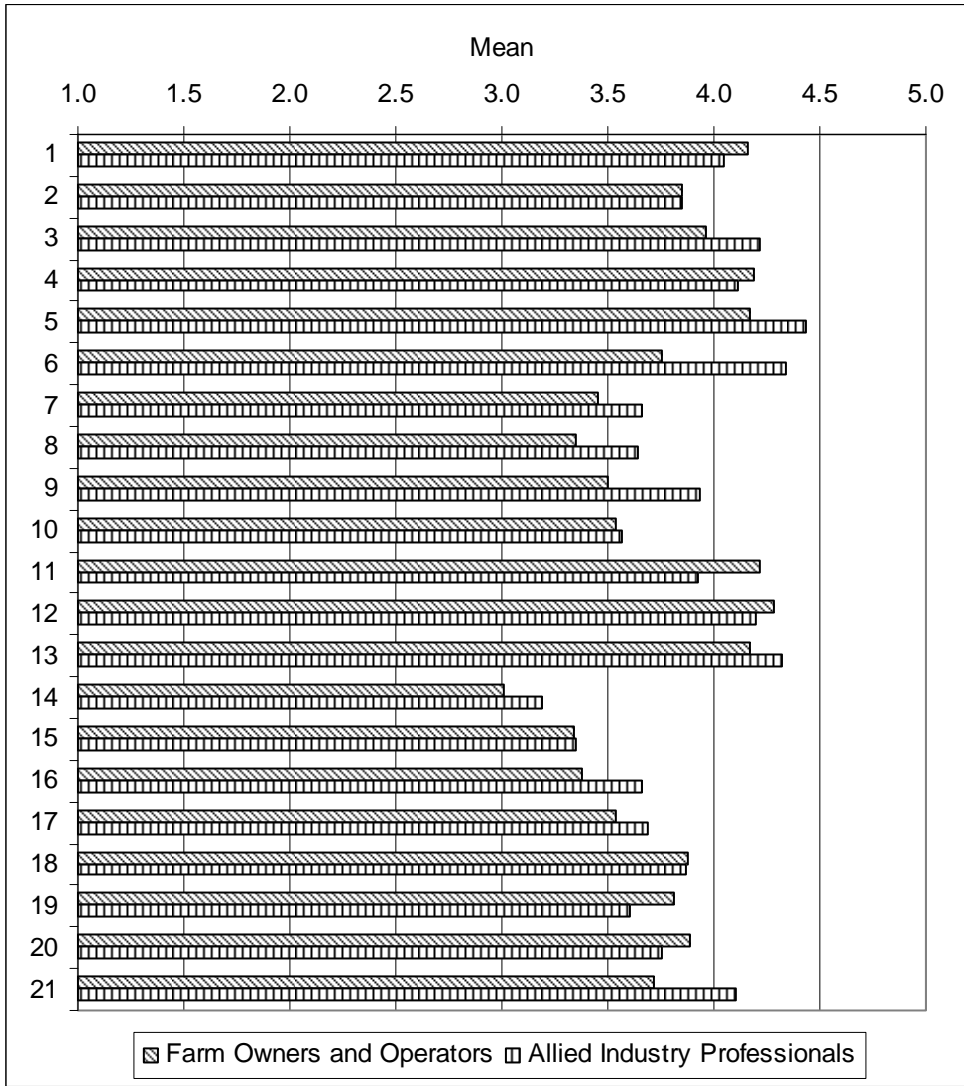


Figure A-2. Industry Viability Items

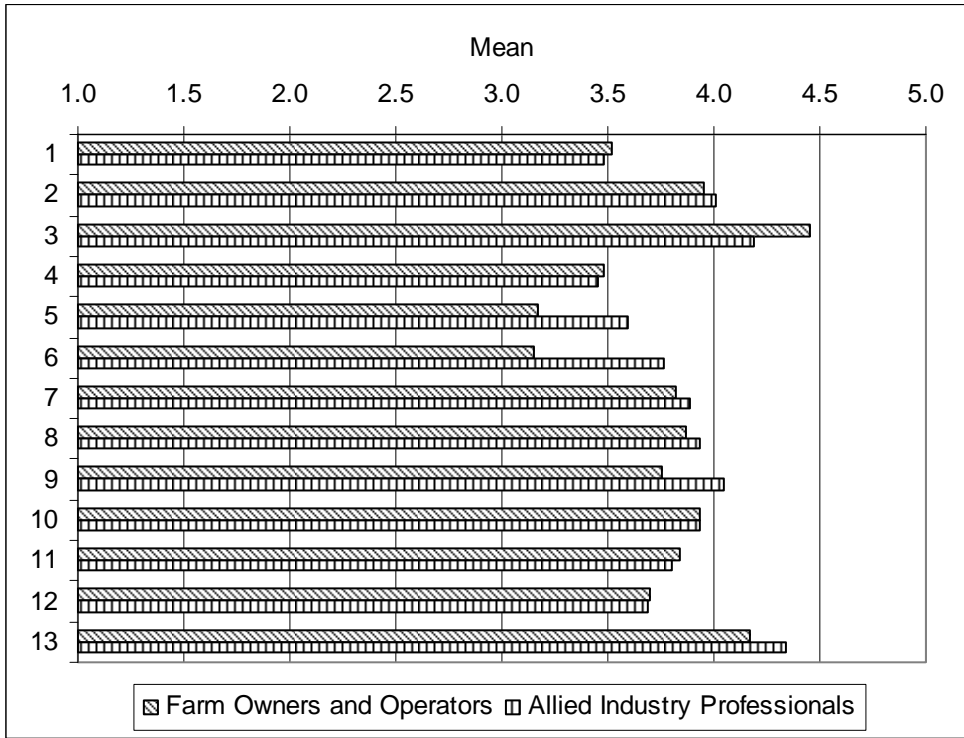


Figure A-3. Industry Concern Items

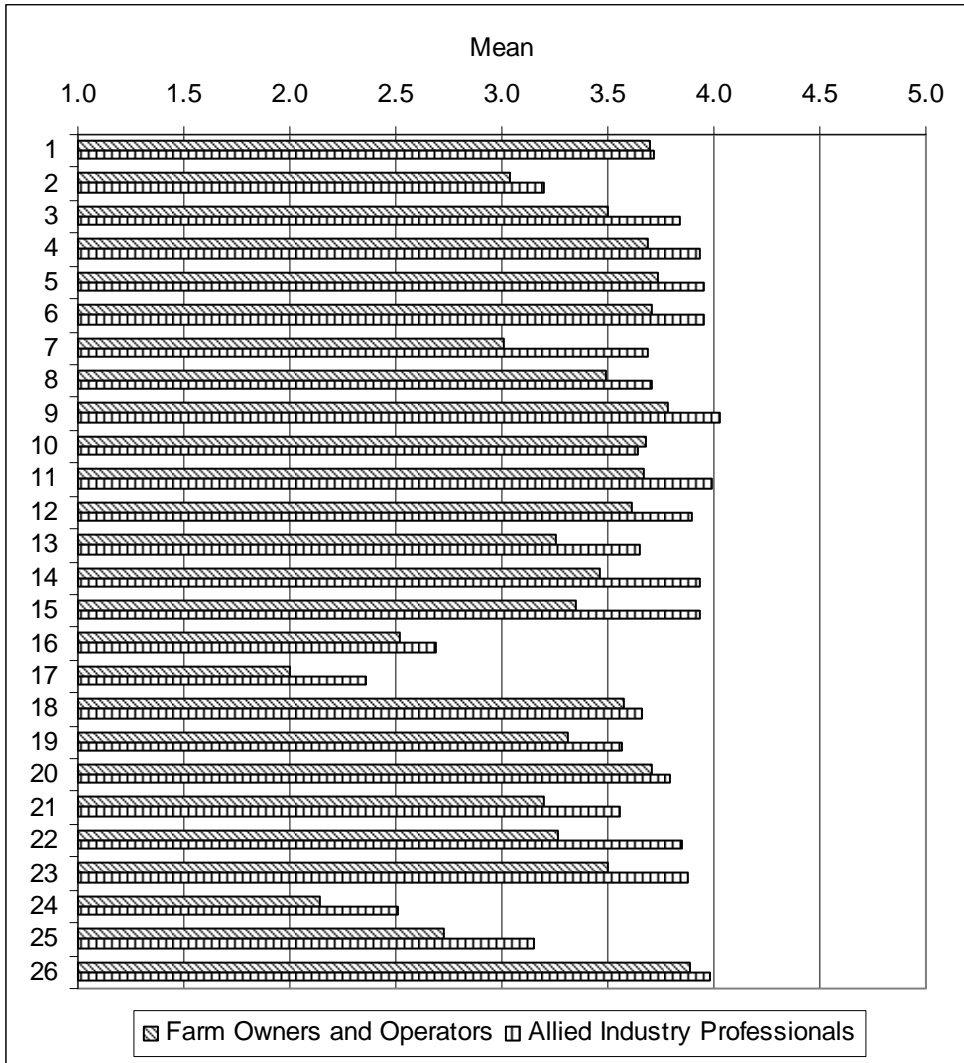


Figure A-4. Herd Management Needs

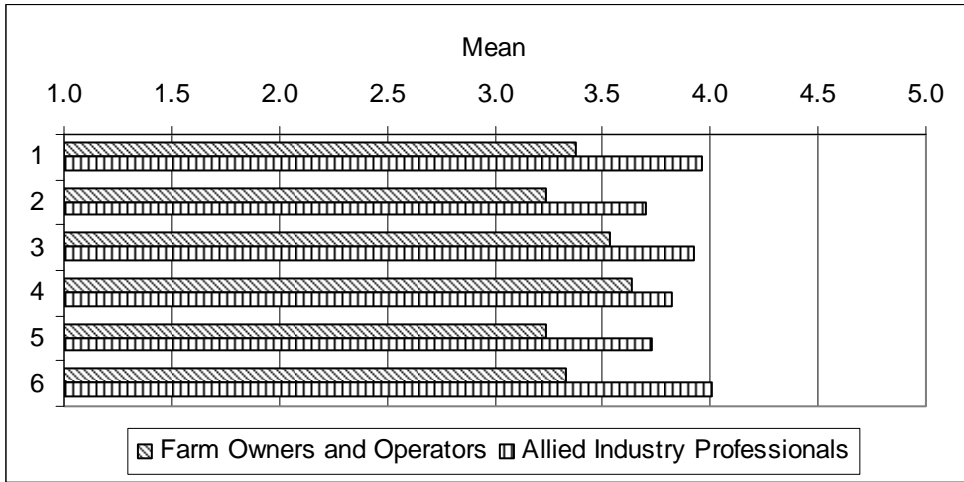


Figure A-5. Environmental Management Needs

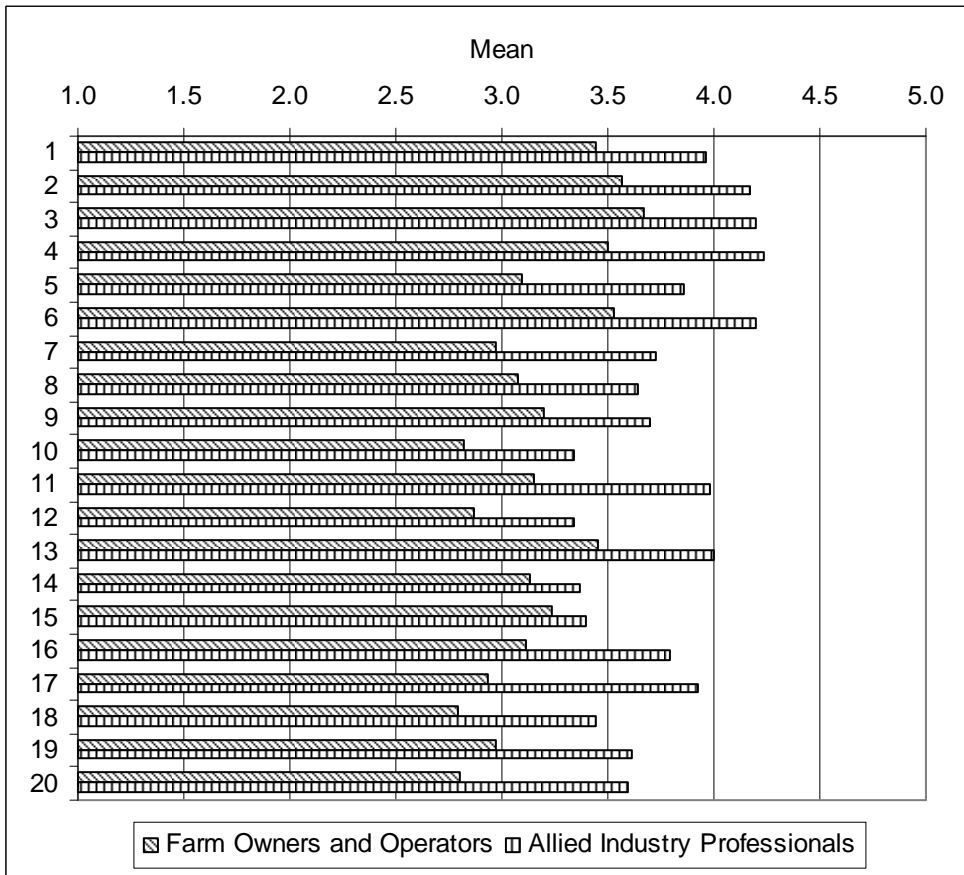


Figure A-6. Business Management and Finance Needs

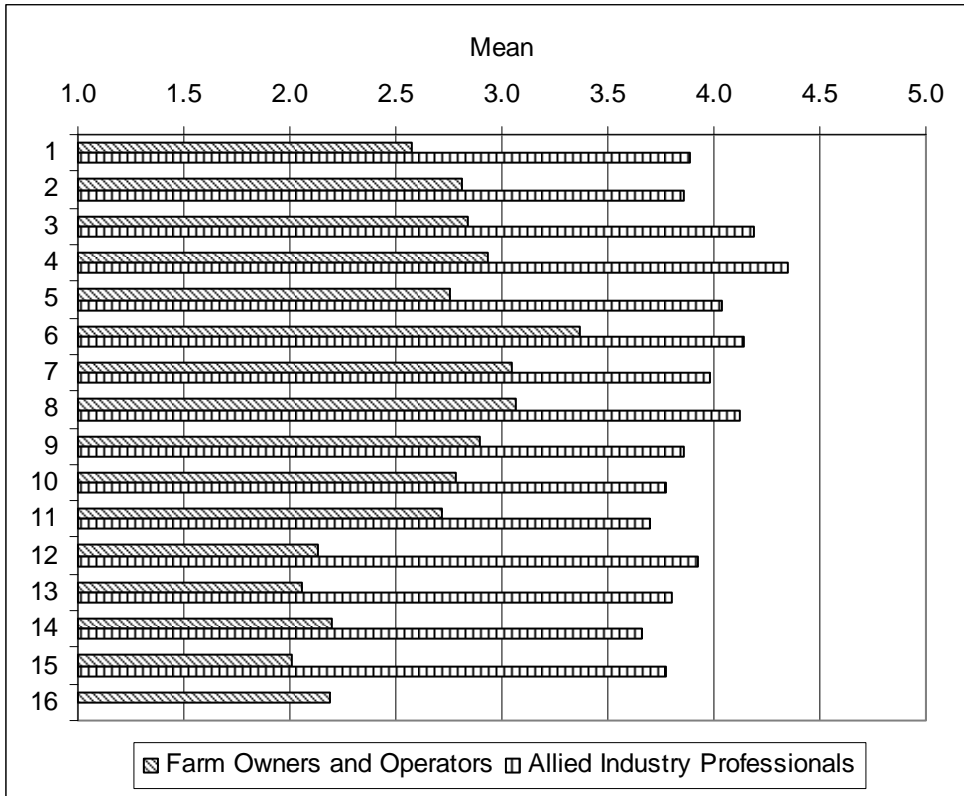


Figure A-7. Human Resource Management Needs (Item 16 was not included in the allied industry professional questionnaire)

Appendix B
Farm Owner and Operator Responses to Industry Issues and Educational Priorities with Significant Differences by Herd Size

Table B-1. Industry issues with significant differences by herd size*

Industry issue	Mean	
	<100 cows	≥100 cows
Availability of farm labor	2.79	3.55
Immigration legislation	2.79	3.51
Availability and market/consumers' acceptance of production technologies	3.49	4.02
Science-based environmental regulations	3.54	3.96
Consumer/public acceptance of scientific information	3.54	3.91
Consumer interpretation of dairy product labels	3.78	4.12
Dairy industry being proactive on environmental issues, including working actively with government agencies	3.80	4.12
Methods to process manure, including renewable fuel (e.g., methane digesters)	3.35	3.66
Planning for and meeting changing state and federal environmental regulations	3.56	3.85
Public image of agriculture	4.04	4.30
Improving public understanding of animal welfare	4.05	4.28
Improving production efficiencies	3.74	3.97
Methods to reduce odor and air pollutants	3.23	3.46
Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law	3.43	3.65
Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers	3.34	3.56
Taking advantage of globalization by increasing dairy exports	4.17	4.39
Inform the public about current farming practices	3.83	4.03
Develop more leaders within the dairy industry	3.36	3.55
Dairy farmers demonstrating environmental stewardship	4.09	4.26
Communicate to consumers about safety of milk products and technologies used	4.33	4.50
Promote the value of the dairy industry in Michigan's economy	4.28	4.44

*Differences between means of smaller and larger farms significant at the 5% level or better (t-Test)

Table B-2. Educational needs with significant differences by herd size*

Educational need	Mean	
	<100 cows	≥100 cows
Herd management		
Grazing management practices and economics	2.89	2.05
Management practices for organic production	2.29	1.71
Strategies to use sexed semen and economic implications	2.46	3.00
Identify bottlenecks to improving herd performance	3.26	3.75
Managing culling rates	3.04	3.46
Impact of stocking density and facility design on production, reproduction, and health	3.14	3.56
Effective strategies for getting cows pregnant	3.71	4.07
Robotic milking systems and their management	1.96	2.31
Foot health and lameness	3.54	3.88
Record analysis and monitoring production, health, and reproduction	3.11	3.41
Increasing cow longevity	3.55	3.85
Impact of heifer raising methods on performance	3.47	3.74
Fresh cow management	3.66	3.90
Feeding to reduce nutrients in manure	3.08	3.32
Calf management	3.56	3.78
Environmental management		
Current regulations and environmental laws	3.41	3.65
Michigan's Agriculture Environmental Assurance Program (MAEAP)	3.13	3.35
Farm business management and finance		
Effectively working with the on-farm management team	2.50	3.35
Contracting farm input	2.76	3.46
Leadership development and training	2.45	3.14
Planning for business growth	2.81	3.48
Contractual agreements with service providers	2.46	3.12
Evaluation of alternative legal business structures	2.60	3.14
Effectively working with consultants	2.73	3.21
Evaluation of farm enterprises	2.96	3.43
Planning and financing business transfer to the next generation	3.23	3.66
Profit maximization strategies	3.46	3.88
Use of financial ratios and benchmarks	2.88	3.29
Milk marketing and price risk management	2.88	3.27
Use of records to improve financial decisions	3.31	3.69
Financial management skills for dairy farmers	3.39	3.74
Understanding the legal system and dealing with lawsuits	3.00	3.26
General farm business management	3.31	3.56
Using insurance and other methods to protect assets	3.13	3.35
Use of partial budgeting	2.86	3.07

*Differences between means of smaller and larger farms significant at the 5% level or better (t-Test)

Table B-3. Human resource management education needs with significant differences by herd size*

Educational need	Mean	
	<100 cows	≥100 cows
Human resource management		
Training materials in Spanish for employees	1.43	2.68
Training employees	2.22	3.46
Immigration legislation and background	1.58	2.82
Managing Latino labor, cultural understanding	1.51	2.75
Hiring quality employees	2.19	3.42
Communicating dairy tasks in Spanish	1.40	2.62
Terminating employees and avoiding legal liability	2.15	3.29
Motivating employees	2.51	3.64
Communicating with employees	2.37	3.49
Developing effective incentives for employees	2.35	3.45
Ensuring job satisfaction and retention of employees	2.50	3.59
Developing wage/benefit package for employees	2.24	3.30
Communication training for employees	2.23	3.26
English language skills for employees	1.69	2.68
General human resource management	2.10	3.05

*Differences between means of smaller and larger farms significant at the 5% level or better (t-Test)

Appendix C
Summary of Allied Industry Professionals' Answers to Open-ended Questions

Item 23. What kind of additional knowledge, education, and training could MSU Extension provide to better serve you in your role?

(1) Education of farmers, consultants and agribusiness managers; however, consultants and business managers may need the information in a more concise form than farmers

Topics (in order of frequency, two and more times written in):

- Nutrition, including forage, silage, haylage, and byproducts
- Record keeping and analysis
- Business management issues (succession, finance, expansion, marketing)
- Managing people
- Calf care and reproduction
- Government programs, industry changes
- Milk quality, best practices for milking

(2) Information on new research results, new technology, available resources (e.g., websites), and how research is done (for farmers)

(3) Collaborate with local veterinarians, Veterinary Medicine College, pharmaceutical industry, service providers, and local dairy advisors and nutritionists, and coordinate a team approach

(4) Timely consultation and troubleshooting (e.g., health, reproduction) by phone, email, as well as on-farm and off-farm

Item 24. Please let us know where you see significant opportunities in dairy farming.

Dairy farming is still a profitable business, where one sees results for hard work.

Specific opportunities (in order of frequency, two or more times written in)

- Manure management⁴; using manure as fertilizer, as an energy source; energy production in general
- Providing training to management personnel on large farms and to young managers
- Employee management skills
- Specialization in heifer raising, calf raising, fresh cow management, crops, feedstuff
- Niche products and marketing, e.g., small coops, organic, animal welfare, rBST milk
- Export dairy products
- Educate consumers and the public on production and product quality
- Provide services, in particular to larger herds, including finance, nutrition, management, equipment, expansion planning
- Cow comfort and animal welfare
- Provide employees, e.g., during harvest, after losses
- Robotic milking

⁴Manure management is seen both as an opportunity (question 24), and as a challenge (questions 25 and 26).

Item 25. What do you consider the biggest challenge facing the dairy industry?

(In order of frequency, two or more times written in)

- (1) Consumer, public perception of animal agriculture, production practices, product quality fueled by animal activist groups; lack of consumer, public education by industry or 3rd parties (MSUE); loss of technology due to lack of education and public perception
- (2) Economic challenges, including input costs and variance of costs, milk price and its variance, profitability of farm operations, farmers' lack of economic analysis and business skills
- (3) Environmental challenges and environmental regulations, including manure management and water use
- (4) Labor availability, legal immigration, and labor management and training
- (5) Land availability and cost
- (6) Lack of next generation farmers and lack of start-up funding for them, lack of next generation agribusiness professionals
- (7) Cow health, comfort, and welfare
- (8) Loss of family farms

Item 26. Is there anything else you would like to share with us?

Answers provide additional suggestions on what MSUE and MSU should do (in order of frequency, two or more times written in), as well as general observations (not included here).

MSUE is doing a good job versus too expensive, not used. Respondents would like to see the survey results used and published.

MSUE and MSU should take a role in educating the public and legislators on agriculture in general, food production, and specific issues; should be an advocate for science-based technologies vis-à-vis the public (e.g., rBST).

Suggestions for improvement include

- Campus specialists need to be more visible off campus; educators need to be more on farms, more contact with industry professionals
- Do not work with niches, work with mainstream
- Small farms need more help
- Educators need to be better educated

Appendix D

Summary of Farm Respondents' Answers to Open-ended Questions

Item 30. Please let us know where you see significant opportunities in dairy farming.

This question provided a long and diverse list with no clear front runners. Six areas were named ten or more times. The first two combined would stand out as the lead responses. Several respondents remarked that there are opportunities for farms of all different sizes, including medium-sized and small farms.

- (1) Niche markets and value added, including goats, as well as direct marketing, processing on farm, and local, including raw milk
- (2) Organic, sustainable, healthy production
- (3) Provide services to large farms (e.g., equipment, manure management, heifers, cropping), work for larger farms, or be a large farm
- (4) Profitable, income, job security due to high milk price (at the time of the survey)
- (5) Increase efficiency, improve team, including by-products, AI, raising heifers, and technology
- (6) Using manure, either as fertilizer or as energy source (algae, digesters)

Other opportunities/positive aspects of dairy farming (five or more instances):

- Export markets, new product development
- Quality, safe, and healthy food production
- Grow high quality feed, including organic feed
- Grass-fed, free range, and grazing
- Good place to raise a family and way of life
- Nutrition management, environmental issues, positive energy balance
- Robotics, other technology use for life quality and efficiency
- Educate consumers, public, and legislators

Item 31. What do you consider the biggest challenge in dairy farming?

This question generated more answers than the previous question, and also more focused themes. The list below includes estimates of the number of instances.

- (1) Economic challenges
 - Increased costs (80), improve efficiency (6), cost variation (3)
 - Stay profitable, make a living, profit per hours worked (43)
 - Control, limit supply to stabilize milk price (18), milk price variation (19)
 - Succession, capital investment need (with and without succession), start-up costs (15)
- (2) Public & consumer perception (73)
 - Perception (46), educate public, consumers, and legislators (9)
 - Activists & special interest groups (18)

- (3) Laws and regulations (55)
 - In general, costs and time involved (29)
 - Environmental (19)
 - Changes in regulations (7)
- (4) Labor and its management (46)
 - General (24), qualified and reliable labor (11), specific issues (11)
- (5) Competition from large farms (27), from immigrant farmers (7)
- (6) Urban neighbors, sprawl (22), land competition, land loss, price of land, tax (17)
- (7) Environmental issues (22)
- (8) Management issues
 - Manure (17)
 - Herd health (11)
 - Feed and nutrition (6)
 - Reproduction and breeding (6)
 - Other (9), including small scale technology and technology loss

Item 32. How can the MSU Extension Dairy Team better serve you?

- (1) Comments on team effectiveness
 - Doing a good job, keep it up (28)
 - Don't know (10)
 - Dairy Team not effective, complaints (8)
- (2) Suggestions for improvement
 - Reach out more, more calls, more farm visits, increase availability/spread too thin (24)
 - More meetings (5), more local meetings (4), farmer panels and on-farm meetings (4), shorter meetings, during off-season (3)
 - More communication, publications, including newsletters; more timely (7)
 - More Internet use, improve web site (5)
- (3) Specific topics: Many diverse suggestions, including to help farmers learn to educate and interact with the public (list includes instances of five or more).
 - Information on trends, developments, laws, regulations, concerns (11)
 - Information for small herds (10)
 - Manager training, marketing training, employee training (9)
 - Information on new research, technologies, system evaluation (8)
 - Ration formulation, feed (8)
 - Deal with rising input costs, debt reduction, record keeping, business analysis (7)
 - Information for organic and non-GMO production (6)
 - Cow management and health (5)

(4) Other functions

- Educate the public and the government (15), advocate for farmers and help to bring about deregulation (7)
- Help farmers organize for various purposes, e.g., marketing agency, young farmers, relief milking, interact with consumers, hiring consultants by the hour (6)

Item 33. Is there anything else you would like to share with us?

Answers were wide-spread with little common ground. The majority of the answers (20) thanked MSU or MSUE for something or everything done.

Themes included:

- (1) Address small farms (9); don't push for large farms (4)
- (2) Help farms with over-regulation (product, environment) (7)
- (3) Shrinking number of farms and educators (6)
- (4) Remember the land grant mission, stand up for farmers, do not witness against farmers (4)

Appendix E
2008 Michigan Dairy Farm Owner and Operator Survey Questions

1. In your opinion, please indicate the level of priority that each topic below should receive from the Michigan dairy industry? (Mark only one box for each statement on the 5-point scale below, where 1 is Not a Priority and 5 is a Very High Priority.)

	Not a Priority			Very High Priority	
	1	2	3	4	5
a. Promote availability of career opportunities in agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Promote the value of the dairy industry in Michigan's economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Increase legislators' knowledge of agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Ensure continuation of Right to Farm program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Maintain adequate access to water resources for agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Work with government to enhance plans to deal with potential foreign animal disease outbreaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Communicate to consumers about safety of milk products and technologies used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Increase dairy product promotion activities and education, especially targeted to youth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Ensure continuation of Cooperatives Working Together (CWT) program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Develop more leaders within the dairy industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Inform the public about current farming practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Work with legislators to fund dairy industry initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. In your opinion, please indicate how important the items below are to the viability of Michigan's dairy industry. (Mark only one box for each statement on the 5-point scale below, where 1 is Not Important and 5 is Very Important.)

	Not Important			Very Important	
	1	2	3	4	5
a. Dairy farmer involvement in the legislative process and representation in regulation development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Improving production efficiencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Dairy industry being proactive on environmental issues, including working actively with government agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Increasing legislators' understanding of the tradeoff between the cost & benefits of complying with regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Dairy farmers demonstrating environmental stewardship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Science-based environmental regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Methods to reduce odor and air pollutants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Methods to process manure, including renewable fuel (e.g., methane digesters)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. New dairy products to increase milk utilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Taking advantage of globalization by increasing dairy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

exports

m. Improving public understanding of animal welfare	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Implementing animal welfare assessments on farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Survey what consumers think about food products and the way they are produced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Assessment of dairy farming's impact on environmental quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Traceability of agricultural products to their origin to improve food safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Greater effort and funding for food safety and inspection programs including imported foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Adopting alternative energy technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Methods to improve disease resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. Consumer/public acceptance of scientific information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Please indicate the level of concern you have about these issues. (Mark only one box for each statement on the 5-point scale below, where 1 is Not a Concern and 5 is a Very High Concern.)

	Not a Concern			Very High Concern	
	1	2	3	4	5
a. Farm business growth to improve quality of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Consumer interpretation of dairy product labels, e.g., hormone-free, antibiotic-free, rBST-free	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Food imports from less regulated countries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Agro-terrorism and bio-terrorism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Availability of farm labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Immigration legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Loss of farm land due to urban encroachment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Farm transfer to the next generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Availability and market/consumers' acceptance of production technologies, e.g., rBST, antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Availability of dairy veterinarians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Successfully eradicating TB in Michigan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Planning for and meeting changing state and federal environmental regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Public image of agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Environmental Management. Please indicate how much knowledge, education, or training you desire for each topic. (Mark only one box for each statement on the 5-point scale below, where 1 is None and 5 is A Lot.)

	None				A lot
	1	2	3	4	5
a. Building good relations with non-farm neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Handling dead animal carcasses, including composting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Current regulations and environmental laws	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Using manure as a fertilizer (e.g., application rates)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Michigan's Agriculture Environmental Assurance Program (MAEAP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Reducing the potential for manure runoff from fields, farm buildings and lots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other, please specify: _____

5. Herd Management. Please indicate how much knowledge, education, or training you desire for each topic. (Mark only one box for each statement on the 5-point scale below, where 1 is None and 5 is A Lot.)

	None					A lot
	1	2	3	4	5	
a. Increasing cow longevity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Impacts of crossbreeding and inbreeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c. Reducing the use of antibiotics through best practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. Best management practices for vaccinations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e. Troubleshooting mastitis and high somatic cell count	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f. Foot health and lameness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g. Farm biosecurity protocols for farm visitors and purchased animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
h. Dry cow management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i. Fresh cow management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
j. Lactating cow management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
k. Calf management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l. Impact of heifer raising methods on performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m. Managing culling rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
n. Cow comfort, stall and bedding systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
o. Impact of stocking density and facility design on production, reproduction, and health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
p. Grazing management practices and economics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
q. Management practices for organic production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
r. Choosing alternative feeds based on feeding value and profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
s. Using bio-fuel byproduct feeds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
t. Quality, digestibility, and production of feeds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
u. Feeding to reduce nutrients in manure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
v. Record analysis and monitoring production, health, and reproduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
w. Identify bottlenecks to improving herd performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
x. Robotic milking systems and their management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
y. Strategies to use sexed semen and economic implications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
z. Effective strategies for getting cows pregnant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other, please specify: _____						

6. Farm Business Management and Finance. Please indicate how much knowledge, education, or training you desire for each topic. (Mark only one box for each statement on the 5-point scale below, where 1 is None and 5 is A Lot.)

	None					A Lot
	1	2	3	4	5	
a. General farm business management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Financial management skills for dairy farmers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c. Profit maximization strategies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. Use of records to improve financial decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e. Use of financial ratios and benchmarks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f. Calculating cost of production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g. Use of partial budgeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
h. Milk marketing and price risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

i. Evaluation of farm enterprises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Evaluation of niche market opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Planning for business growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Evaluation of alternative legal business structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Planning and financing business transfer to next generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Understanding the legal system and dealing with lawsuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Using insurance and other methods to protect assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Contracting farm inputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Effectively working with the on-farm management team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Contractual agreements with service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Effectively working with consultants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Leadership development and training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____					

7. Please identify which of the following your dairy operation has or uses? (Indicate which are used by checking Yes or No.)

	Yes	No		Yes	No
a. Farm emergency plan	<input type="checkbox"/>	<input type="checkbox"/>	d. Manure/nutrient management plan	<input type="checkbox"/>	<input type="checkbox"/>
b. Mission statement	<input type="checkbox"/>	<input type="checkbox"/>	e. Comprehensive Nutrient Management Plan	<input type="checkbox"/>	<input type="checkbox"/>
c. Business plan	<input type="checkbox"/>	<input type="checkbox"/>	f. Accountant (taxes, business planning)	<input type="checkbox"/>	<input type="checkbox"/>

8. Human Resource Management. Please indicate how much knowledge, education, or training you desire for each topic. (Mark only one box for each statement on the 5-point scale below, where 1 is None and 5 is A Lot.)

	None					A lot
	1	2	3	4	5	
a. General human resource management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Hiring quality employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c. Training employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d. Communicating with employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e. Communication training for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f. Communicating with family members involved in the farm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g. Ensuring job satisfaction and retention of employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
h. Motivating employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i. Developing effective incentives for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
j. Developing wage/benefit package for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
k. Terminating employees and avoiding legal liability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l. Managing Latino labor, cultural understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m. Training materials in Spanish for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
n. Immigration legislation and background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
o. Communicating dairy tasks in Spanish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
p. English language skills for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other, please specify: _____						

9. Please identify which of the following are routinely used or practiced on your dairy farm? (Indicate which are used by checking Yes or No.)

	Yes	No		Yes	No
a. Artificial insemination (AI)	<input type="checkbox"/>	<input type="checkbox"/>	g. Estrus/ovulation synchronization	<input type="checkbox"/>	<input type="checkbox"/>
b. Manure testing	<input type="checkbox"/>	<input type="checkbox"/>	h. On-farm management team	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | | |
|------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|
| c. Forage/feed analysis | <input type="checkbox"/> | <input type="checkbox"/> | i. External management team | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Soil testing | <input type="checkbox"/> | <input type="checkbox"/> | j. Ration formulation via computer | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Managed intensive grazing | <input type="checkbox"/> | <input type="checkbox"/> | k. Standard operating procedures | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Organic farming practices | <input type="checkbox"/> | <input type="checkbox"/> | l. Computerized herd records, e.g., DHI | <input type="checkbox"/> | <input type="checkbox"/> |

10. In the past 5 years, how valuable was the information you obtained from the following sources to manage/operate the dairy farm? (Mark only one box for each source on the 5-point scale below, where 1 is No value and 5 is Very Valuable. Or mark N.A. (not applicable) if you did not receive any educational material or advice for a source.)

	No Value					Very Valuable					N.A.
	1	2	3	4	5	1	2	3	4	5	
a. MSU Extension Agent/Educator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. MSU campus faculty/Extension Specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Other universities' faculty/extension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Milk cooperative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Michigan Farm Bureau	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Dairy nutrition consultants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Dairy management consultants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Veterinarians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Other dairy farmers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Industry-sponsored meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____											

11. In the past five years, how much value did you receive from information presented in these formats to manage the dairy farm? (Mark only one box per line on the 5-point scale below, where 1 is No Value and 5 is Very Valuable. Or mark N.A. if this does not apply to you.)

	No Value					Very Valuable					N.A.
	1	2	3	4	5	1	2	3	4	5	
a. Half-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Full-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Magazines and newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. MSUE newsletters, Michigan Dairy Review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Radio or TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Live presentations via the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other Internet-based material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Training material on DVD, e.g., videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. One-on-one education or consulting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____											

12. Please indicate how you would like to receive educational information or training in the coming years? (Mark only one box per line on the 5-point scale below, where 1 is Not Preferred and 5 is Highly Preferred.)

	Not Preferred			Highly Preferred	
	1	2	3	4	5
a. Half-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

b. Full-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Magazines and newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. MSUE newsletters, Michigan Dairy Review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Radio or TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Live presentations via the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other Internet-based material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Training material on DVD, e.g., videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. One-on-one education or consulting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____					

13. In the past five years, how much value do you feel employees from this farm received from information presented in these formats? (Mark only one box per line on the 5-point scale below, where 1 is No Value and 5 is Very Valuable. Or mark N.A. if this does not apply to you.)

	No Value		Very Valuable			N.A.
	1	2	3	4	5	
a. Half-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Full-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Magazines and newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. MSUE newsletters, Michigan Dairy Review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Radio or TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Live presentations via the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other Internet-based material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. On-farm hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Off-farm hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Training material on DVD, e.g., videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____						

14. Please indicate how you would like farm employees to receive educational information or training in the coming years? (Mark only one box per line on the 5-point scale below, where 1 is Not Preferred and 5 is Highly Preferred.)

	Not Preferred			Highly Preferred	
	1	2	3	4	5
a. Half-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Full-day seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Magazines and newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. MSUE newsletters, MI Dairy Review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Radio or TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Live presentations via internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other internet-based material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. On-farm hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Off-farm hands-on training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Training material on DVD, e.g., videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify: _____					

15. Which roles would you like MSU Extension to play in your business and the Michigan dairy industry in the next 10 years? (Please check your top three choices.)

- | | |
|--|---|
| <input type="checkbox"/> Manager training | <input type="checkbox"/> Source of educational material |
| <input type="checkbox"/> On-farm consulting | <input type="checkbox"/> Farm management advice |
| <input type="checkbox"/> Employee training | <input type="checkbox"/> Leadership development |
| <input type="checkbox"/> Agribusiness training | <input type="checkbox"/> Other, please specify: _____ |

16. What type of Internet connections are available to you? (Please check all that apply.)

- None Dial-up DSL Cell phone/Wireless provider Satellite
 Cable Company Don't Know Other, please specify: _____

17. What type of Internet connections do you use? (Please check all that apply.)

- None Dial-up DSL Cell phone/Wireless provider Satellite
 Cable Company Don't Know Other, please specify: _____

18. What barriers limit your use of the Internet? (Please check all that apply.)

- None Time Desire Cost No connection Lack of hardware
 Speed of connection Lack of understanding Availability of information
 Don't trust the information Other, please specify: _____

19. How would you describe your current position? (Please check all that apply.)

- Dairy farm owner or operator Family member of the farm owner or operator
 Dairy farm employee Other, please specify _____

20. How long have you held your current position (in years)? (Please check only one box.)

- under 1 1-5 6-10 11-15 16-20 over 20

21. What is your age (in years)? (Please check only one box.)

- under 25 25-34 35-44 45-54 55-64 65 and over

22. What is your gender? male female

23. What is your highest level of education? (Please check only one box.)

- | | |
|--|---|
| <input type="checkbox"/> Less than Grade 12 | <input type="checkbox"/> 2 year college degree/Ag Tech degree |
| <input type="checkbox"/> High school graduate | <input type="checkbox"/> 4 year college degree |
| <input type="checkbox"/> Post high school technical training | <input type="checkbox"/> Advanced college degree |
| <input type="checkbox"/> Some college | <input type="checkbox"/> Other, please specify _____ |

24. What is your herd size (milking and dry cows)? (Please check only one box.)

- <50 50-99 100-149 150-199 200-249 250-299
 300-499 500-999 ≥1000

25. What was the average milk production in 2007 (pounds per cow per year sold)? _____

26. How many acres (rented and owned) were farmed in 2007? _____

	Family	Non-Family
27. a. What is the number of employees on the farm? Please include all family members (paid & unpaid).	a. _____	_____
b. How many work more than 39 hours per week?	b. _____	_____
c. How many work 20 to 39 hours per week?	c. _____	_____
d. How many work less than 20 hours per week?	d. _____	_____

28. How long do you feel your dairy farm will be in business, either owned by you or the next generation? *(Please check only one box.)*
 5 years or less 6 to 10 years 11 to 20 years more than 20 years

29. What was your net farm income in dollars in 2007? *(Net farm income is schedule F cash farm income plus capital gains plus approximate inventory changes. Please check only one box.)*
 <1 1-9,999 10,000-49,999 50,000-99,999 100,000-149,999
 150,000-199,999 200,000-499,999 ≥500,000

30. Please let us know where you see significant opportunities in dairy farming?
(space for write-in comments provided)

31. What do you consider the biggest challenge in dairy farming?
(space for write-in comments provided)

32. How can the MSU Extension Dairy Team better serve you?
(space for write-in comments provided)

33. Is there anything else you would like to share with us?
(space for write-in comments provided)