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The Influence of Extension on Team Success of a Milk Quality Improvement Program

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Abstract: *A mail survey was used to determine the influence of Extension on team success of a milk quality improvement program for Wisconsin dairy producers. Producers who did not learn about Milk Money from Extension were less likely to complete the program and reported an increased bulk milk somatic cell count at the time of survey. Producers who did not use an Extension agent as the team leader were less likely to complete Milk Money compared to teams led by Extension agents. The impact of Extension on team success of Milk Money should be considered when creating new Extension programs.*

Introduction

Mastitis control programs are effective at increasing milk production on dairy farms and improving overall dairy profitability (Payne, Bruhn, Reed, Scearce, & O'Donnell 1999). Different approaches have been used; however, most programs focus on adoption of research-based practices that reduce the amount of subclinical and clinical mastitis (Morin, Peterson, Whitmore, Hungerford, & Hinton, 1993; Peters et al., 1994; Rodrigues & Ruegg, 2005; Sargeant, Schukken, & Leslie, 1998; Sischo, Kiernan, Burns, & Byler, 1997). Between 2001 and 2008, Wisconsin dairy producers had the opportunity to enroll in an Extension-led mastitis control program named Milk Money (MM) designed to provide a comprehensive team approach to manage milk quality by setting key goals, tasks and a 4-month timeline for each team.

Results of dairy producer participation in MM have been previously described (Rodrigues, Caraviello, & Ruegg, 2005; Rodrigues & Ruegg, 2005); however, little is known about the role Extension played in the long-term success of MM teams. The primary objective of the research reported here was to evaluate the influence of Extension MM participation on team success. The secondary objective of the research was to evaluate the long-term performance and opinions of dairy producers previously enrolled in MM.

Research Methodology

A nine-page, postage-paid questionnaire <http://milkquality.wisc.edu/programs/milk-money/> was designed and sent to WI dairy producers in June 2006 using standard survey methodology (Dillman, 1978). Eligible dairy producers (n = 323) were identified from a database containing information regarding previous voluntary registration into MM. Responses to open-ended questions were reviewed by the authors and categorized (categories are reported in tables in results section). Statistical analyses were performed using SAS/STAT, Version 9.1 Edition, 2002-2003.

Results

Profile of Responders

A survey response rate of 44% was achieved. Not all of the questions were answered by all responders. Of the responding group (n = 142), 93.7% (n = 133) indicated that they participated in a MM team and were included in the analyses. Producers responding to the survey were stratified by year of initial enrollment in MM (Table 1).

Table 1.

Percentage[1] of Producers Responding to the Survey Stratified by Year of Initial Enrollment in Milk Money

	Survey	
Enrollment Year	**Sent (n)**	**Returned[2] (%)**
2001 and 2002	96	33.3
2003	89	30.3
2004	103	45.6
2005	35	77.1

[1] Proportions of responding farms are different by year ($P < 0.001$).

[2] Surveys from producers that indicated participation in the Milk Money program were included.

Method Learned About Milk Money

The methods by which producers (n = 173 responses, n = 132 farms) learned about MM were from University of Wisconsin (UW) Extension agents or by attending Extension meetings (55.3%), media (33.3%), dairy plant field representatives (13.6%), private veterinarians (13.6%), and other sources (15.2%). Producers who did not learn about MM from UW Extension agents or meetings were seven times less likely to complete MM compared to producers who did learn about the program from UW Extension agents or meetings (odds ratio (OR) = 0.14, $P < 0.03$). The method learned about MM was not associated with continuing to meet after completion of the program ($P = 0.24$).

Producers who learned about MM from UW Extension agents or Extension meetings had a lower bulk milk somatic cell count (BMSCC) (213,091 cells/ml) at the time of the survey compared to farms that did not learn about MM from UW Extension agents or extension meetings (282,554 cells/ml) ($P < 0.02$). Producers who learned about MM from the media milked fewer cows (157 cows) at the time of the survey as compared to farms that learned of the program in other ways (258 cows) ($P < 0.03$).

Team Composition

Overall team composition (defined as the number of people who attended at least two team meetings) (n = 133 responses) included: herd owner (96.2%), private veterinarian (86.5%), UW Extension agent (78.2%), dairy plant field representative (75.2%), nutritionist (57.9%), equipment representative (51.9%), family member (45.1%), key herd manager (37.6%), MM staff veterinarian (24.8%), and other (22.6%).

The most common team leader reported by producers (n = 131) was an UW Extension agent (65.6%), followed by herd owner or family member (14.5%), private veterinarian (5.3%), MM staff veterinarian (5.3%), and other (7.6%). Two (1.5%) producers reported having no team leader. Producers who used a herd owner or family member as their team leader were 11 times less likely to complete MM compared to producers who had a UW Extension agent as their team leader (OR = 0.09, $P < 0.05$). Most (90.7%) teams having a UW Extension agent as their team leader completed MM, and fewer than half (42.1%) of teams having a herd owner or family member as their team leader completed MM.

Some (38.3%) responders (n = 133) reported that they did not pay any team members for attendance at MM meetings. However, 51.1% of farms paid a private veterinarian, 18.8% of farms paid an employee, 9.8% of farms paid an equipment representative, 7.5% paid a herd owner or other family member, and 5.3% paid other team members.

Program Completion and Continuation

Producers' teams were categorized into three categories; not completing the program (n = 26), completing but not continuing the program (n = 69), and completing and continuing the program (n = 38). Of responders who reported they did not complete MM, 22 reported reasons (Table 2). Reasons for not continuing to meet after MM completion included: had already made good progress or reached milk quality goals (37.9%), program was finished (22.7%), no one

organized the meetings (18.2%), or other reasons (21.2%). Of responders who reported that they continued to meet (n = 38), annual meeting frequency was once or twice (43.3%), three or four (27.0%), five or more (24.3%), or other (5.4%). Producers reported that they continued to meet because: working together was an effective way to solve problems (20.4%); they had not yet reached their milk quality goals (16.3%); they had made good progress and wanted to continue working together (15.3%); the team worked well together (14.3%); they had a team leader who organized the meeting (9.2%); they liked meeting as a team (9.2%); or other reasons (15.3%).

Table 2.

Why Your Team Did Not Meet for At Least Four Meetings (n = 22)

Category and Description	n	%
No Need to Meet	**7**	**31.8**
Already good BMSCC[1]		
Less than four meetings was enough		
Not necessary		
No Organization	**5**	**22.7**
Could not get organized		
Group did not want to meet		
No participation		
No Time	**7**	**31.8**
Conflicting schedules of team members		
Not enough time		
Other priorities		
Other	**3**	**13.7**

[1]Bulk Milk Somatic Cell Count.

There were no differences in characteristics of responding producers' teams based on completion or continuation of MM (Table 10) ($P \geq 0.6$). There was a tendency ($P = 0.09$) for teams that did not complete the program to report greater BMSCC compared to teams that completed the program (Table 3). There was a tendency ($P = 0.06$) for teams that completed and continued MM to have a greater standard plate count compared to teams that did not complete and teams that completed but did not continue MM after program completion (Table 3). General Management practices were reported (Table 4).

Table 3.

Characteristics of Responding Wisconsin Dairy Producers Stratified by Completion and Continuation of Milk Money

	Completion and continuation of Milk Money					Overall			
	Not complete (n = 26)	Complete not continue (n =69)	Complete and continue (n = 38)						
Outcome	**Mean (n)**	**Mean (n)**	**Mean (n)**	***P***	**n**	**Mean**	**SE**	**Min.**	**Max.**
Current premium ($)	0.32	0.35	0.28	0.53	84	0.33	0.03	-0.03	0.95
Current milk price ($) (including premium)	12.15	12.47	12.51	0.66	100	12.42	0.14	10.60	23.00
Total lactating cows (n)	228.3	232.6	225.8	0.99	125	229.7	20.7	20.0	1200.0
Yield per cow day (kg)	32.5	33.2	33.9	0.63	117	33.3	0.5	18.1	45.4
BMSCC (cell/ml)	294,667	227,254	242,800	0.09[a]	122	244,980	11,255	17,000	900,000
Standard plate count (cfu/ml)	6,650	4,224	6,767	0.06[a]	108	5,380	1,644	1,000	35,000
Monthly rate of clinical mastitis[1]	0.04	0.03	0.03	0.51	116	0.03	0.003	0	0.25
Monthly cows									

culled for mastitis[2] (%)	0.53	0.41	0.60	0.53	112	0.01	0.001	0	0.04
Monthly cows culled[3] (%)	2.33	2.04	1.65	0.17	117	0.02	0.001	0.02	0.06

[1] Bulk Milk Somatic Cell Count.

[2] Reported monthly no. clinical mastitis cases/ no. reported lactating cows.

[3] % of cows culled due to mastitis or milk quality reason in previous month.

[4] % of total cows culled in previous month.

[a] Analyzed as log10.

Table 4.

Management Practices of Responding Wisconsin Dairy Producers Stratified by Completion and Continuation of Milk Money

	Completion and continuation of Milk Money				
Management Practice	Not complete (n = 26)	Complete not continue (n =69)	Complete and continue (n = 38)	**P**	**Overall**
Have a complete milking routine (%)[1]	80.8	82.5	75.7	0.71	80.2
Forestrip (%)	84.6	95.2	86.5	0.18	90.5
Predip (%)	92.3	90.5	86.5	0.72	89.7
Always wear gloves during milking (%)	73.1	86.6	86.5	0.25	83.9
Dry udder using 1 towel per cow (%)	88.5	92.7	91.9	0.81	91.6
Have a written milking routine (%)	40.0	45.6	43.2	0.89	43.9
Culture bulk milk several times per year (%)	44.0	42.7	47.2	0.91	44.2

Have a written treatment protocol for clinical mastitis (%)	29.2	50.0	46.0	0.21	45.0
Record clinical mastitis (%)	61.5	90.0	67.6	0.002	78.3
Have on-farm milk culturing lab (%)	12.0	7.6	30.6	0.007	15.0
Use CMT[2](%)	70.8	77.6	86.1	0.35	78.7
Plan milk quality program with farm veterinarian (%)	15.4	22.1	35.1	0.16	24.4
Discuss milk quality issues with dairy plant field representative (%)	28.0	42.7	59.5	0.05	44.6
Have regular meetings between dairy plant field representative and veterinarian to talk about milk quality improvement (%)	11.5	5.9	13.5	0.39	9.2

[1] Defined as use of a milking routine that includes forestrip, predip, dry and postdip.

[2] California Mastitis Test.

Retention Rates of Best Management Practices for Herds Completing Milk Money

The use of one paper or cloth towel to dry a cow's udder during milking preparation was the most retained best management practice (95.7%) (Table 5). Having a complete milking routine (66.7%) and always wearing gloves during milking (66.7%) were the most frequently adopted best management practices (Table 5).

Producers were more likely to adopt the use of a frequent training program for milking technicians rather than discontinue the use of this best management practice (OR = 10.5, P = 0.003) (Table 5). Producers were more likely to discontinue recording clinical mastitis than adopt this best management practice (OR = 25.7, $P < 0.04$) (Table 5). Producers were more likely to discontinue planning a milk quality program with their farm veterinarian than adopt this best management practice (OR = 3.5, $P < 0.001$) (Table 5). Producers were more likely to discontinue discussing milk quality issues with their dairy plant field representative than adopt this best management practice (OR = 5.4, $P < 0.001$) (Table 5). Producers were more likely to discontinue having regular meetings between their dairy plant field representative and farm veterinarian to discuss milk quality improvement than adopt this best management practice (OR

= 1.4, $P < 0.001$) (Table 5).

Table 5.

Retention of Best Management Practices on Farms Completing Milk Money Between the End of the Program and Time of Survey (3.6 Years Later)

Management practice	n	Completion of program	Survey	Retention[2]	P	OR	Adoption[3]
Have a complete milking routine (%)[1]	68	91.8	83.8	85.5	0.17		66.7
Dry udder using 1 towel per cow (%)	76	92.1	90.8	95.7	0.65		33.3
Always wear gloves during milking (%)	75	92.0	92.0	94.2	1.00		66.7
Have a written milking routine (%)	76	50.0	51.3	71.1	0.83		31.6
Have a frequent training program for milkers (%)	69	56.5	75.4	92.1	0.003	10.5	53.3
Record clinical mastitis (%)	71	94.4	85.9	89.6	0.034	25.7	25.0
Culture bulk milk several times per year (%)	74	91.9	46.0	50.0	<0.001	0.03	0.0
Have a written treatment protocol for clinical mastitis (%)	74	52.7	47.3	69.2	0.37		22.9
Plan milk quality program with farm veterinarian (%)	75	73.3	32.0	38.2	<0.001	3.5	15.0
Discuss milk							

quality issues with dairy plant field representative (%)	76	81.6	52.6	59.7	<0.001	5.4	21.4
Have regular meetings between dairy plant field representative and veterinarian to talk about milk quality improvement (%)	74	64.9	9.5	10.4	<0.001	1.4	7.7

[1] Defined as use of a milking routine that includes forestrip, predip, dry and postdip.

[2] Proportion of teams that were performing the best management practice at completion of program and time of survey (%).

[3] Proportion of herds that were not performing the best management practice at completion of program but were at time of survey (%).

Opinions of Long-Term Impact of Milk Money

An open-ended question asked producers if participating in MM had a long-term impact on the quality of milk produced on their farm. Of responders, 82% believed the program had a long-term impact on milk quality. More producers with teams that continued to meet after program completion believed the program had a long-term impact on their farms (94.3%) compared to producers who completed the program but did not continue (82.8%) or producers who did not complete the program (60.9%).

A few producers (n = 21) listed a variety of reasons why they believed MM did not have a long-term impact on their farm (Table 6). Reasons were listed by producers who believed program participation resulted in a long-term impact on their farm (n = 95) (Table 7).

Table 6.

Reasons Producers Listed for Why They Did Not Believe There Was a Long-Term Impact of Milk Money on Their Farm (n = 21

Category and Description	n	%

No Change	**8**	**38.1**
BMSCC[1] did not improve		
Did not solve milk quality issues		
No substantial change observed		
No Need	**5**	**23.8**
Already low BMSCC[1]		
Less than four meetings was enough		
Good system already in place		
Other Priorities	**5**	**23.8**
Financial issues		
Management issues		
Not able to cull cows		
Other	**3**	**14.3**

[1] Bulk Milk Somatic Cell Count.

Table 7.

Reasons Producers Listed for Why They Believed There Was a Long-Term Impact of Milk Money on Their Farm (n = 95)

Category and Description	n	%
Attentive	**21**	**22.1**
More attentive to details		
Program pointed out changes needed		
Recognize costs associated with mastitis		
Increases awareness of milk quality issues		
Lower SCC[1]	**31**	**32.6**
Decreased BMSCC[2]		
Improved Milk Quality	**16**	**16.8**
Implementation of proper high quality milking procedures		
Milk quality is a top priority		
Milking Routine	**7**	**7.4**

Changed milking routine		
Observed employees milking		
Team	**9**	**9.5**
Long-term relationship with teammates		
Identify appropriate individuals to consult dairy		
Team-work		
Organization		
Other	**11**	**11.6**

[1] Somatic Cell Count.

[2] Bulk Milk Somatic Cell Count.

Producers with teams that did not complete the milk quality program were more likely to perceive it as not resulting in a long-term impact on their farm as compared to producers who completed the program (OR = 5.5, $P < 0.02$). Not surprisingly, producers whose farms had experienced increased BMSCC at the time of the survey were much more likely to indicate that MM had not resulted in a long-term impact on their farms as compared to producers whose farms had decreased BMSCC (OR = 285.2, $P < 0.002$).

Producers were asked to provide their perceptions of the strengths and weaknesses of MM and recommendations for improvement. Fewer weaknesses (n = 88, Table 8) were listed as compared to strengths (n = 192, Table 9). Suggestions (n = 58) were given by producers on how MM can be improved (Table 10).

Table 8.

What Are the Two Most Significant Weaknesses of the Program? (n = 88)

Category and Description	n	%
Limited Program	**27**	**30.7**
Spanish resources		
Expand program veterinary services		
Expand UW-Extension participation		
Limited number of cultures		
Post Milk Money	**11**	**12.5**
No follow-up after program		
No Milk Money II		

Team Communication	**25**	**28.4**
Team-work difficulty		
Not all members are involved and devoted		
Need a good team to succeed		
Time	**18**	**20.4**
Conflicting schedules		
Hard to get all members to attend		
Program takes time to complete		
Other	**7**	**8.0**

Table 9.

What Are the Two Most Significant Strengths of the Program? (n = 192)

Category and Description	**n**	**%**
Improvement	**25**	**13.0**
Find problems that overlooked before		
Lowered BMSCC[1]		
Improved milk quality		
Focus	**17**	**8.9**
Points out areas needing improvement		
Scheduled meetings		
Thoroughness		
Resources	**28**	**14.6**
Access to current research		
Helping producer find resources they need		
Hands on observation and training		
Information packet		
Team	**100**	**52.1**
Team-work		
Ability to look at a situation with other prospective		
Team members have the same goal		

Setting goals		
Program tracks progress		
Other	**22**	**11.4**

[1] Bulk Milk Somatic Cell Count.

Table 10.

How Can the Milk Money Program Be Improved? (n = 58)

Category and Description	n	%
Post Milk Money	**13**	**22.4**
Follow-up after program completion		
Keep meetings going		
Yearly checks on progress after program completion		
Support	**29**	**50.0**
Spanish materials		
Increase contact with UW[1] Professionals		
More resources		
On-farm milking time evaluations		
Train	**8**	**13.8**
Training of Spanish-speaking employees		
Training of milking technicians		
Training for team leader		
Training materials		
Human Resource information		
Other	**8**	**13.8**

[1]University of Wisconsin.

Producers were asked to list the three most important management changes that occurred on their farms as a result of participating in the MM program (Table 11).

Table 11.

What Are the Three Most Important Management Changes That Occurred as a

Result of the Milk Money Program to Impact the Quality of Milk Produced on Your Farm? (n = 297)

Category and Description	n	%
General Management	**60**	**20.2**
Vaccination schedules		
Culling		
Nutrition		
Employee management		
Equipment		
Hygiene		
Housing	**28**	**9.4**
Freestall maintenance		
Bedding type		
Bedding protocols		
Scrape barn alleys more		
Mastitis	**67**	**22.6**
Mastitis		
Segregation of cows		
Detection of mastitis		
Treatment of mastitis		
Individual cow culture		
Bulk tank culture		
Milking	**107**	**36.0**
Milking routine		
Milking order		
Milking technician training		
Spanish protocols		
Teat dip		
Other	**35**	**11.8**

Monthly Outcomes for Herds Completing Milk Money

The number of lactating dairy cows increased by 29 cows between the end of MM and the time of the survey (3.6 years) (Table 12). Milk production increased by 2.8 kg per cow per day ($P < 0.001$). Bulk milk SCC decreased by 43,053 cells/ml ($P < 0.001$) (Table 12). Reported monthly clinical mastitis rate decreased by 1.52% ($P < 0.01$) (Table 2). Total monthly cull rate decreased by 0.81% ($P < 0.01$) (Table 12).

Table 12.

Monthly Outcomes of WI Dairy Farms Completing Milk Money Between the End of the Program and Time of Survey (3.6 Years Later)

Outcome	n	Completion of program	Survey	Difference	P
Lactating cows (n)	71	226	255	29	<0.001
Yield per cow per day (kg)	71	30.8	33.6	2.8	<0.001
BMSCC (cells/ml)	75	271,253	228,200	-43,053	<0.001[a]
Standard plate count (cfu/ml)	69	8,434	5,478	-2,956	0.38[a]
Monthly clinical mastitis (%)[1]	59	4.92	3.40	-1.52	<0.005
Monthly cows culled for mastitis (%)[2]	59	0.74	0.44	-0.30	0.07
Monthly total cows culled (%)[3]	65	2.85	2.04	-0.81	0.005

[1] Bulk Milk Somatic Cell Count.

[2] Reported monthly no. clinical mastitis cases/ no. reported lactating cows.

[3] % of cows culled due to mastitis or milk quality reason in previous month.

[4] % of total cows culled in previous month.

[a] Analyzed as log10.

Discussion and Implications for Extension

Milk Money was started in 2001 and designed to help dairy producers and professionals promote improvement in milk quality and farm profitability. Milk Money is a voluntary statewide Extension program in Wisconsin. Upon enrollment, farms commit to form a milk quality team of

their choice and meet for four meetings (usually in four consecutive monthly meetings). These meetings focus on reaching self-defined milk quality goals. The use of the team, program materials, and action items prioritize management changes that help the dairy producer reach their goals.

The short-term impact of MM (meetings 1 through 4) on milk quality goals has proven successful because recommended management practices were highly adopted upon completion of MM and the majority of dairy producers considered themselves successful in achieving their milk quality goals (Rodrigues & Ruegg, 2005). Additional information about MM, including forms used and resources are on the UW Milk Quality website: <http://milkquality.wisc.edu/>

For the research reported here, a survey response rate of 44% was achieved and is similar to survey response rates from comparable research using mailed questionnaires and dairy producers as the target population: 9.5% (Weigel & Barlass, 2003), 21.6% (Braiser, Hyde, Stup, & Holden, 2006), 33.7% (Higginbotham & Kirk, 2006), 53.2% (Meyer, Garnett, & Guthrie, 1997), and 53% (Hoe & Ruegg, 2006). The population used was composed of Wisconsin dairy producers who had previously enrolled in MM. The data collected for the study was from a mail survey completed and returned by dairy producers. The survey was sent at least 1 year (average = 3.6 years) after producers' enrollment into MM. Producers participated in the survey voluntarily. Producers with teams more recently enrolled into MM were more likely to respond to this survey.

The primary objective of the research reported here was to evaluate the influence of Extension MM participation on team success. The method by which producers learned about MM influenced program completion and BMSCC at time of survey. As expected, most producers learned about MM from a UW Extension agent or meeting, and the participation of UW Extension agents was associated with successful outcomes of participation. Producers who did not learn about the program from UW Extension were less likely to complete the program and had increased BMSCC at the time of survey completion.

The role of the team leader was instrumental in organizing and continuing team meetings. The use of an "outside" team leader may lend more formality to the program and result in more program compliance because producers who used the herd owner or a family member as the team leader were less likely to complete MM compared to teams with UW Extension agents as team leaders. University of Wisconsin Extension personnel played a vital role in the success of MM teams. As shown in the study reported here, Extension-led teams had a greater long-term impact on results, which is applicable to all fields of Extension. In this study, MM teams started and led by Extension agents resulted in improved milk quality results and a better perceived overall success of the team.

Reasons why learning about MM from UW Extension and having an Extension agent as a team leader influenced completion of the program may include the following: Extension agents are trained as educators, they have enhanced experience with the program because they are often team members on multiple teams, and their profession is to lead and teach. A study evaluating

the impact of dairy diagnostic teams on herd performance that required Extension agents as team members concluded that the Extension agents were the "glue" that held the teams together and that they kept the meeting process continuing (Weinland & Conlin, 2003). This is similar to what was observed in the study presented here. Herd owners or family members may be more likely to be preoccupied with other issues on the farm and therefore do not have enough time to adequately prepare to organize and lead the team. This conclusion is supported by survey results from producers who did not perceive that MM resulted in long-term impact on their farms.

The secondary objective of the research reported here was to evaluate the long-term performance and opinions of dairy producers previously enrolled in MM. The majority of responding producers indicated that MM had a long-term impact on the quality of milk produced on their farms. New suggested ideas for improving the MM program were presented in survey responses. In general, the themes were expanding the MM program through service development, UW Extension continued participation, and providing follow-up meetings after the program is completed.

Milk Money has been proven to influence adoption of best management practices on farms (Rodrigues & Ruegg, 2005). Similar to the study reported here, a study evaluating a statewide Extension program in calf and heifer management in Pennsylvania reported an increased adoption of management practices recommended during the 3-year program period, and 77.3% of participating producers credited the Extension program for the adoption of practices on their farms (Heinrichs & Kiernan, 1994). In the survey results reported here, a majority of those adopted practices were retained from the completion of the MM program to the time of survey. As identified by Braiser, Hyde, Stup, and Holden (2006), Extension programs have an opportunity to improve productivity of dairy employees and improve dairy producers human resource management skills potentially leading to increased dairy farm productivity and sustainability.

Additionally, goal setting is a step that influences success of Extension programs. Interactive Extension programs involving demonstrations and personal contacts with dairy farms have been shown to be more effective than more traditional methods of writing articles and county meetings (Wood, Natzke, & Rounsaville, 1978). An additional 8% of farms adopted recommended management practices that were shown to reduce BMSCC and increase milk production when using interactive Extension methods compared to traditional methods (Wood, Natzke, & Rounsaville, 1978). Milk Money uses Extension agents, team members (industry professionals), resource materials, a website, and interactive forms throughout the program. As indicated by survey responses, producers suggest expanding these items to improve the program. This stresses how effective interactive materials are for Extension program success and growth.

The results of the study reported here have implications for Extension beyond dairy programs. To summarize, key points that should be considered when developing Extension programs are:

- Extension Leader
- Team Environment
- Interactive Materials
- Goal Setting
- Specific Timeline

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