

## **B. Collections of Information Employing Statistical Methods**

### **1. Describe the potential respondent universe and any sampling or other respondent selection methods to be used.**

A complete list of dairy heifer-raisers in the U.S. is not available. The 27 States<sup>1</sup> participating in the study will be asked to assemble a list of heifer-raising operations within their respective States. Most States will likely only develop a partial or incomplete list of heifer-raising operations. Approximately 800 dairy heifer raisers in the 27 states will be identified and contacted to participate in the study. The states were selected based on participation in NAHMS Dairy studies, proximity to a major dairy producing state, or state interest. These 27 states account for over 93 percent of milk cows and over 88 percent of milk cow operations in the United States. This is a rare population that has never been studied previously. This population is important because of public health and commercial dairy health implications. For example, many of the dairy operations involved in recent TB outbreaks potentially acquired the disease from heifer raising facilities.

The goal of the study is to gain insight about the population rather than to create precise population estimates. This information will be useful for developing appropriate outreach programs and identifying general areas of concern. The respondent universe will be all heifer raising operations in the 27 states. NAHMS will provide questionnaires as well as educational materials to the States for the study. Based on information collected during the NAHMS Dairy 2007 Study, it is estimated that there are between 2,000 and 4,000 heifer raisers in the U.S. It is estimated that 480 operations will participate in this study.

### **2. Describe the procedures for the collection of information including:**

#### **Statistical methodology for stratification and sample selection:**

State Animal Health Officials in participating States will develop a list of heifer raising operations. No sampling of the operations on the list will be performed. Each operation will be contacted by the state animal health official via phone or in person. Every heifer raising operation on the list will be offered the opportunity to complete the questionnaire via personal interview. Total contacts and refusals will be recorded. If possible, the reason for refusal will be noted.

#### **• Estimation procedures:**

The sample of participating heifer raisers will be considered equivalent to a simple random sample. Non-response adjustments will be made to the initial selection weight of one. No additional weight adjustments will be used for example to adjust for list incompleteness since the population size is relatively unknown.

The statistical estimation will be undertaken using standard SAS procedures.

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<sup>1</sup> Targeted States Include: AZ, CA, CO, FL, IL, IN, IA, KS, KY, MI, MN, MO, NV, NM, NY, ND, OR, PA, SD, TX, UT, VT, VA, WA, WI. Additional information is available in Appendix A.

- **Degree of accuracy needed:**

The study has been designed with a goal of 80 percent power, 95 percent confidence and a coefficient of variation less than 20 percent.

A sample size of 800 respondents will allow estimates of 50 percent +/- 6.2 percent and 10 percent +/- 3.7 percent (cv=18.5 percent). Assuming a response rate of 60 percent, 800 heifer raising operations would be approached to get 480 completed surveys.

- **Unusual problems requiring specialized sampling procedures and data collection cycles:**

There are no unusual problems requiring specialized sampling procedures and data collection cycles.

### ***3. Describe methods to maximize response rates and to deal with issues of non-responses:***

#### **Study Design:**

- ❑ Many proven questions have been repeated from previous NAHMS dairy studies conducted in 2002 and 2007.
- ❑ The study minimizes collection of data to that which is absolutely necessary to meet the stated objectives.
- ❑ The Dairy specialist for NAHMS has made numerous contacts and collaborative efforts to identify the information needs of the industry and the best way to ask for that information via questionnaire.

#### **Contacting Respondents:**

- State Animal Health Officials and APHIS data collectors will personally contact heifer raisers, either by phone or in person, and ask them to complete the survey. Heifer raisers that are not contacted or decline to participate will be recorded to determine the response rate.

#### **Data Collection Steps:**

- ❑ The State Animal Health Officials or APHIS data collectors will conduct the on-farm interview to complete the questionnaire.

#### **Data Analysis Steps:**

- The response rate is expected to be approximately 60 percent, based on experience with dairy producers in the Dairy 2007 study (Appendix B). Data will be weighted so participating operations will represent those that were identified but did not elect to participate.

**4. Describe any tests of procedures or methods to be undertaken.**

Initially, the questionnaire will receive extensive review by a wide variety of experts including researchers, extension, veterinarians/poultry health specialists and epidemiologists. The proposed questionnaire will be tested during the pretest phase involving less than 10 respondents. Results of these pretests will be utilized to refine the information collection in order to reduce respondent burden and improve the usefulness of the information.

**5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and /or analyze the information for the agency.**

The statistical aspects of the design were coordinated by Dr. George Hill, Mathematical Statistician, and Dr. Jason Lombard, Veterinary Epidemiologist, USDA: APHIS, Veterinary Services, CEAH, Fort Collins, CO, (970) 494-7245. The actual data collection will be conducted by State and APHIS designated data collectors. Contact persons for data collection are:

- Dr. John Clifford, Deputy Administrator, USDA: APHIS, Veterinary Services, Washington, DC (202) 447-6835.

Analysis of the data will be accomplished by NAHMS veterinarians, epidemiologists, and statisticians under the direction of:

- Dr. Bruce Wagner, Center Director, National Animal Health Monitoring System, USDA: APHIS, VS, CEAH, 2150 Centre Avenue, Building B MS2E7, Fort Collins, CO 80526-8117 (970) 494-7256.

## Appendix A: U.S. Milk Cow Population and Operations, 2010<sup>2</sup>

State	Number of Milk Cows Jan. 1, 2010 (x1,000) <sup>1</sup>	Number of Operations, 2007 <sup>2</sup>
Alabama	11	160
Alaska	0.6	30
*Arizona	167	180
Arkansas	13	340
*California	1,760	2,200
*Colorado	116	450
Connecticut	18.5	270
Delaware	6	80
*Florida	112	420
Georgia	76	640
Hawaii	1.8	15
*Idaho	550	810
*Illinois	101	1,200
*Indiana	169	2,000
*Iowa	215	2,400
*Kansas	116	780
*Kentucky	80	2,300
Louisiana	21	300
Maine	33	480
Maryland	54	660
Massachusetts	13	310
*Michigan	354	2,700
*Minnesota	470	5,100
Mississippi	17	180
*Missouri	102	2,600
Montana	15	390
Nebraska	59	490
*Nevada	28	60
New Hampshire	15	220
New Jersey	8.5	150
*New Mexico	318	270
*New York	610	5,700
North Carolina	43	460
*North Dakota	21	400
*Ohio	272	3,700
Oklahoma	57	980
*Oregon	114	600
*Pennsylvania	540	8,300
Rhode Island	1.1	40
South Carolina	17	110

*South Dakota	92	660
Tennessee	53	1,200
*Texas	410	1,300
*Utah	82	450
*Vermont	134	1,200
*Virginia	95	1,200
*Washington	243	820
West Virginia	10	370
*Wisconsin	1,260	14,200
Wyoming	6	120
*27 Selected States (% of U.S.)	8,531 (93.9%)	63,070 (88.2%)
United States	9,080.50	69,995

<sup>1</sup>Source: NASS Cattle report, January 19, 2010.  
<sup>2</sup>NASS Farms, Land in Farms, and Livestock Operations 2006 Summary report, February 2007. An operation is any place having one or more head of milk cows, excluding cows used to nurse calves, on hand at any time during the year. Dairy 2007 States: CA, ID, IN, IA, KY, MI, MN, MO, NM, NY, OH, PA, TX, VT, VA, WA, WI

## Appendix B: NAHMS Dairy 2007 and 2002 Review of Response Rates

### 1. Dairy 2007 and 2002 sample review

#### a. General Dairy Management Report (NASS) response rates:

Response category	Dairy 2007		Dairy 2002		
	No. Ops.	%	No. Ops.	%	
Complete & VMO consent	1,077	30.3	1,438		37.1
Complete & refused consent	990	27.9	905	23.3	
Complete & ineligible	127	3.6	118	3.0	
<i>Subtotal</i>	<i>2,194</i>	<i>61.8</i>	<i>2,461</i>		<i>63.4</i>
No milk cows on 1/1/2002	214	6.0	227		5.9
Out of business	111	3.1	183		4.7
Out of scope	6	0.2	45		1.2
<i>Subtotal</i>	<i>2,525</i>	<i>71.1</i>	<i>2,916</i>		<i>75.2</i>
Refusal	785	22.1	821		21.2
Inaccessible	118	3.3	137		3.5
Unknown/office hold	126	3.5	2	0.1	
<i>Total</i>	<i>3,554</i>	<i>100.0</i>	<i>3,876</i>		<i>100.0</i>

## Appendix C: Estimated Response Rates for the Dairy Heifer Raiser 2011 study

Estimated response percentages and counts for the survey.

Response category	Percentage	Expected counts
Complete	60.0	480
Refusal	40.0	320
Total	100.0	800

## Appendix D: Publications with estimates from NAHMS Dairy 2007 Study relating to heifer raising operations.

- Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, October 2007, pps 29-37
- Off-Site Heifer Raising on U.S. Dairy Operations, 2007, info sheet, November 2007

## Appendix E: NAHMS Dairy 2007 Publications

### Descriptive Reports

- Part I: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, October 2007
- Part II: Changes in the U.S. Dairy Cattle Industry, 1991–2007, March 2008
- Part III: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, September 2008
- Part IV: Reference of Dairy Cattle Health and Management Practices in the United States, 2007, February 2009
- Part V: Changes in Dairy Cattle Health and Management Practices in the United States, 1996–2007, July 2009

### Interpretive Reports

- Facility Characteristics and Cow Comfort on U.S. Dairy Operations, 2007, Interpretive Report, December 2010
- Heifer Calf Health and Management Practices on U.S. Dairy Operations, 2007, Interpretive Report, February 2010
- Biosecurity Practices on U.S. Dairy operations, 1991–2007, Interpretive Report, May 2010
- *Salmonella*, *Listeria*, and *Campylobacter* on U.S. Dairy Operations, 2007, Interpretive Report, December 2010

### Information Sheets

- Off-Site Heifer Raising on U.S. Dairy Operations, 2007, info sheet, November 2007
- Colostrum Feeding and Management on U.S. Dairy Operations, 1991–2007, info sheet, March 2008
- Calving Intervention on U.S. Dairy Operations, 2007, info sheet, February 2009
- Passive Transfer in Dairy Heifer Calves, 1991–2007, info sheet, March 2010
- Bovine Viral Diarrhea (BVD) Management Practices and Detection in Bulk Tank Milk in the United States, 2007, info sheet, October 2008
- Milking Procedures on U.S. Dairy Operations, 2007, info sheet, October 2008
- Prevalence of Contagious Mastitis Pathogens on U.S. Dairy Operations, 2007, info sheet, October 2008
- Johne's Disease on U.S. Dairies, 1991–2007, info sheet, April 2008
- Antibiotic Use on U.S. Dairy Operations, 2002 and 2007, info sheet, October 2008
- Prevalence of *Salmonella* and *Listeria* in Bulk Tank Milk and In-line Filters on U.S. Dairies, 2007, info sheet, July 2009
- *Salmonella* and *Campylobacter* on U.S. Dairy Operations, 2002–07, info sheet, July 2009
- *Salmonella*, *Listeria*, and *Campylobacter* on U.S. Dairy Operations, 2007, Interpretive Report, November 2010
- Prevalence of *Coxiella burnetii* on U.S. Dairy Operations, 2007, info sheet, December 2010
- Prevalence of *Clostridium difficile* on U.S. Dairy Operations, 2007, info sheet, December 2010
- Dairy Cattle Identification Practices in the United States, 2007, info sheet, November 2007

- Bovine Leukosis Virus (BLV) on U.S. Dairy Operations, 2007, info sheet, October 2008
- Reproduction Practices on U.S. Dairy Operations, 2007, info sheet, February 2009
- Injection Practices on U.S. Dairy Operations, 2007, info sheet, February 2009
- Methicillin-Resistant *Staphylococcus aureus* (MRSA) Isolation from Bulk Tank Milk in the United States, 2007, info sheet, December 2010

#### Manuscripts

- Beam, A.L., Lombard, J.E., Koprak, C.A., Garber, L.P., Winter, A.L., Hicks, J.A., and Schlater, J.L. 2009. Prevalence of failure of passive transfer of immunity in newborn heifer calves and associated management practices on U. S. dairy operations. *J Dairy Sci.* 92:3973-3980.
- Virgin, J.E., Van Slyke, T.M., Lombard, J.E., and Zadoks, R.N. 2009. Short Communication: Methicillin-resistant *Staphylococcus aureus* (MRSA) Detection in Bulk Tank Milk. *J Dairy Sci.* 92:4988-4991.
- Ruzante, J. M., Lombard, J.E., Wagner, B.A., Fossler, C.F., Karns, J.S., Gardner, I.A. 2010. Factors associated with *Salmonella* presence in environmental samples and bulk-tank milk from U.S. dairies. *Zoonoses and Public Health*. Epub ahead of print.
- Lombard, J.E., Tucker, C.B., von Keyserlingh, M.A.G., Koprak, C.A., Weary, D.M. 2010. Associations between cow cleanliness, hock scores and stall usage on US dairy farms. *J Dairy Sci* 93:4668-4676.