B. Collections of Information Employing Statistical Methods

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

The potential respondent universe of the Dairy 2014 study is all operations with dairy cows that responded to the 2012 Census of Agriculture, in 17 States.[1] The preliminary selection of States to be included in the study was done in February 2013, and was based on the 2007 Census of Agriculture and the 2012 milk cow inventory (Appendix C). While NASS continues to publish annual reports on dairy cow inventories by State, NASS no longer publishes an annual report with the number of dairy operations by State. Thus, our estimates on the number of dairy operations were based on the 2007 Census of Agriculture.

The goal of NAHMS national studies is to include States that account for at least 70 percent of the animals and producer population in the United States. The initial review of States identified 17 major dairy States accounting for 81.3 percent of the operations with milk cows (dairy herds) and 81.1 percent of the milk cow inventory. Of the 17 States selected, 16 participated in the Dairy 2007 study. New Mexico participated in the Dairy 2007 study but was not selected for the Dairy 2014 study because of poor response rates in numerous NAHMS studies. Colorado took the place of New Mexico in the Dairy 2014 study. Virginia is not one of the top 17 dairy States but was included in Dairy 2007 because of an expressed desire to participate. Because of its participation in the previous study and continued interest, Virginia was also included in Dairy 2014.

There will be 2 modes of administration for Phase I of the Dairy 2014 study: farms with 30+ milk cows will be surveyed on farm by NASS field enumerators; farms with 1–29 milk cows will be surveyed by telephone (CATI, computer-assisted telephone interview).

Response rates from previous NAHMS dairy studies are shown in Appendix A. Based on data from the Dairy 2007 study, the expected response rate for the NASS on-farm component of the Dairy 2014 study is 59 percent, and the response rate for the CATI portion of the Dairy 2014 study is expected to be 55 percent (Appendix B).

Farms with 30+ milk cows will be eligible to participate in Phase II of the Dairy 2014 study, which will entail farm visits by APHIS–Veterinary Services personnel. Farms with 1–29 milk cows will not be eligible to participate in Phase II. Criterion for eligibility will be their January 1, 2014, inventory of at least 30 milk cows, as reported on the NASS questionnaire.

[1] California, Colorado, Idaho, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Texas, Vermont, Virginia, Washington, Wisconsin.

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

Statistical methodology for stratification and sample selection

Sampling methodology— Dairy 2014 study: The NASS list frame of dairy operations (from the 2012 Ag Census) will initially be divided into 2 groups: farms with 1-29 milk cows and farms with 30+ milk cows. A sample of 3,000 dairy operations will be selected from the group of operations with 30+ milk cows, and 500 operations will be selected from the group of operations with 1–29 milk cows. Samples will be selected independently in the two groups.

For both groups, the list frame will initially be stratified by State. The State-level allocation will be based on a weighted proportion of the number of operations and the cow inventory in the State relative to the total in the 17 States. Preliminary allocation numbers by State appear in Appendix D. The percentage of operations in the State will get a weight of 0.4 and the percentage of milk cows will get a weight of 0.6. For example, if California has 23.8 percent of the dairy cows and 3.7 percent of operations in the 17 selected States, it will initially be assigned 15.8 percent (23.8*0.6+3.7*0.4=15.8) of the sample of 3,500. The allocation will be smoothed to reduce the burden on the NASS enumerators in States with large dairy populations. Within States the sample will then be allocated within size strata (for the operations with 30+ milk cows). This allows an oversampling of large operations to capture more of the milk cow inventory.

Within each state/size category stratum, a simple random sample is selected by NASS from their list frame. NAHMS does not have access to the list frame; the final dataset only includes records in the sample.

Estimation procedure

The sampling design is a stratified random sample with unequal probabilities of selection. The statistical estimation will be undertaken using either SAS survey procedures or SUDAAN. Both software packages use a Taylor series expansion to estimate appropriate variances for the stratified, weighted data.

Degree of accuracy needed for the purpose described in the justification

In order to obtain an estimate of 10% +/- 3.0% with 95% confidence (cv=15.0%) a sample size of 384 is needed when a simple random sample is taken. However, the complex survey design typically will result in variances that are inflated, requiring larger sample sizes than would be needed with an SRS. Design effects for previous NAHMS studies typically ranged from less than one up to three. Assuming a typical design effect of 2.0 and a response rate of 60 percent, a sample size of 1,280 [(384*2)/0.6] would be needed to obtain the desired precision in each of 2 regions when the estimate is 10 percent.

The design of the Dairy 2007 study was very similar to the proposed design for the Dairy 2014 study. The initial sample size for the Dairy 2007 NASS component was 3,554. Estimates and standard errors (based on the 2,194 completed questionnaires) indicate that the minimum degree of precision desired was attained in 2007 for the NASS component and for the VS component.

It was estimated that a sample of 3,000 for operations with 30+ milk cows would meet the desired accuracy. For operations with 1–29 milk cows, a sample of 500 will yield a cv of about 30%; however, this was considered satisfactory given the need to capture a high percentage of the milk cow inventory and also the need to have an adequate number of farms eligible (30+ milk cows) to participate in Phase II of the Dairy 2014 study.

- **Data collection**

  For the CATI component (500 operations), NASS will mail a presurvey letter announcing the Dairy 2014 study. NAHMS-314 will be mailed to the 500 operations along with a request to complete the questionnaire and return by mail. NASS will contact nonrespondents to complete NAHMS-314 via computer-assisted telephone interviews. Data will be validated and edited during the telephone interview and the data file will be provided to NAHMS without identifiers.

  For the NASS enumerator component (3,000 operations), up to 5 telephone calls will be made by the NASS enumerator to set up a convenient time to introduce and explain the study. If the enumerator cannot contact the producer via phone, the enumerator will drive to the dairy operation to initiate contact and will either complete the interview at that time or establish another time for the interview. If the dairy operation's location cannot be established, the selected unit will be coded as inaccessible. Once contact is made, the NASS enumerator will administer NAHMS-307. Upon completion of the interview, the respondent will be asked to sign a consent form allowing NASS to turn his/her name over to APHIS for continuation in the study; this will complete Phase I of the study. Approximately two out of three producers are expected to sign the consent form. NASS will provide the list of producers willing to participate in the second phase of the study (additional questionnaires and in some cases, biologic sampling) to NAHMS coordinators in each State immediately following Phase I. Once all the information on NAHMS-307 has been entered and validated, NASS will send a dataset to NAHMS along with completed questionnaires without personal identifiers via mail.

  Phase II of the study consists of an on-farm interview administered by a data collector, typically a veterinary medical officer (VMO). The data collector will contact the producer to set up a time to administer the study questionnaires and collect biological samples if indicated. Upon arrival on the premises, the data collector will present NAHMS-313 (Producer Agreement) to the producer which allows the producer to indicate what portion(s) of the Dairy 2014 study he/she agrees to participate in. Once NAHMS-313 is completed and signed, the data collector will administer NAHMS-308 (VS Visit Questionnaire) to the producer. If the producer has consented to allow biologic samples to be taken, these may be collected after completing NAHMS-308. NAHMS

forms 305-306 and 309-312 will be completed for the corresponding biologic samples that are collected on the operation. Collection of biologic samples and information corresponding for forms 310-312 will be limited to approximately 425 operations per form number, and collection of samples and information corresponding to forms 305, 306, and 309 will be limited to approximately 300 operations per form number. The data collector may set up separate times to come back to the farm to complete the biological sampling. The completed questionnaires will be returned to NAHMS via U.S. mail. For approximately 300 operations, samples and assessments from heifer calves will be taken monthly. These data will only be collected on those farms that consent to do so. These data may be collected by a veterinary medical officer or, in some cases, university extension veterinarians or private veterinarians. On the consenting operations, every month biologic samples will be taken from two calves per operation and will be submitted to the National Veterinary Services Laboratories, the USDA Agricultural Research Service laboratory in Beltsville, Maryland, or another undetermined laboratory. In addition, at each visit, NAHMS-305 will be completed and then returned to NAHMS via U.S. mail.

- **Unusual problems requiring specialized sampling procedures**

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

Any use of periodic (less frequent than annual) data collection cycles to reduce burden

There will be no periodic (less frequent than annual) data collection cycles.

3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

Study Design:

- Many questions have been repeated from previous NAHMS dairy studies conducted in 1991–92, 1996, 2002, and 2007.

- The study minimizes collection of data to that which is absolutely necessary.

- NAHMS will develop training information that NASS can post to an Intranet site for NASS enumerators that explains the purpose of the study and addresses anticipated difficulties with questions, including proper pronunciation of diseases.

- After participating in a telephone conference call training session with NAHMS staff, each State's NAHMS coordinator (VMO) will help train NASS enumerators in their respective States.

- The NAHMS coordinator conducting training will acquaint the NASS enumerators with NAHMS, their role in the information collection, and the type of information to be reported resulting from the data collected.

- Similarly, for the VMO component, each State NAHMS coordinator will receive up to 3 days of specialized training via NAHMS staff and in return train the APHIS field data collectors in their States.

- 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.

- A sample of 3,000 operations with at least 30 dairy cows and 500 operations with fewer than 30 dairy cows will be drawn from NASS' producer list.

- A presurvey letter[2] will be sent along with the marketing information sheet.[3] Upon personal contact by the enumerator the marketing information sheet will again be presented so there is a connection back to the presurvey letter introducing the study.

Contacting Respondents:

- The study has been announced and is supported by the National Milk Producers Federation (NMPF), American Association of Bovine Practitioners (AABP), and the National Mastitis Council.

- Producers with 30 or more dairy cows will be called by the NASS enumerator up to 5 times followed by an on-farm visit before they are listed as a refused or inaccessible operation.

- Producers with fewer than 30 dairy cows will be called by NASS telephone enumerators up to 5 times before coding the sample inaccessible.

- The APHIS designated data collector will contact farms that have consented to have their names turned over to APHIS and set up a convenient time for the producer to complete the questionnaire and conduct biological sampling.

Data Collection Steps:

- Data collectors will arrive at the premises at the agreed-upon time.

- For operations with at least 30 dairy cows, the NASS enumerators will complete NAHMS-307 and ask eligible producers to sign the consent form.

- Operations with fewer than 30 dairy cows will receive NAHMS-314 by mail and will have the opportunity to complete the form and return via U.S. mail. For producers who

[2] Sample of pre-survey letter is attached.
[3] Marketing information sheet is attached.

do not respond to the mailing, the NASS telephone enumerator, via CATI, will complete NAHMS-314.

- The APHIS data collectors will administer NAHMS forms 305, 306, 308, 309, 310, 311, 312, and 313 to the consenting producers.

Data Analysis Steps:

Response rates, given the methods described above, are expected to be approximately 60 percent. If the number of respondents differs substantially from the number of nonrespondents there will be the potential for bias. There are two approaches that we will use to examine for potential bias. First, NASS' control data on its list frame will be available for both respondents and nonrespondents to allow for examination of potential differences in the types of responding and nonresponding producers. The information will include number of milk cows for each selected unit. For the VMO phase (Phase II) we will have the survey data from Phase I available for comparing respondents versus nonrespondents as well as the control data from the NASS list frame. Second, we can compare estimates from the study with available indicators from other sources. For example, although we do not publish estimates of dairy cattle, the survey results will allow us to make estimates that we can use to compare against NASS' inventory estimates. This study is the fifth dairy study that we have conducted and we can compare current estimates with results from the previous studies (1991–92, 1996, 2002, and 2007).

The complex sampling design necessitates the use of weights which reflect the initial sample selection probabilities (the inverse of the selection interval). The initial selection probabilities are provided by NASS. Weights of nonrespondents will be transferred to responding operations that are most similar based on available data that are provided by NASS for the sampled operations. The VMO phase weight adjustments will account for nonresponse in Phase II of the Study. Within categories, the sum of weights of the nonrespondents and respondents will be divided by the sum of the weights of the respondents only. This factor will be used to adjust the weights of the respondents within the category. All weights for nonrespondents will be set to zero.

4. ***Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.***

The proposed questionnaires will be tested during the pretest phase involving fewer than 10 respondents. Results of these pretests will be utilized to refine the questionnaires 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 Ms. Christine Kopral, Statistician, USDA–APHIS, Veterinary Services, CEAH, Fort Collins, CO, (970) 494–7125. The actual data collection will be conducted by APHIS-designated data collectors.
Contact person for data collection is:

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

Consultants used for the Dairy 2014 study are:

Dr. Jamie Jonker, Vice President, Scientific & Regulatory Affairs, National Milk Producers Federation, 2101 Wilson Blvd, Suite 400, Arlington, VA 22201, (703) 243–6111 ext. 344

Dr. Frank Garry, Integrated Livestock Management, Colorado State University, 300 West Drake Rd, Fort Collins, CO 80526, (970) 297–0371

Dr. Jerry Olson, Senior Veterinarian-Dairy, Zoetis Animal Health, 1808 Willow Springs Way, Fort Collins, CO 80528, (970) 231–1693

Dr. Marina von Keyserlingk, Associate Dean, Graduate Studies; Professor, Animal Welfare, NSERC Industrial Research Chair, University of British Columbia, MCML 181 - 2357 Main Mall, Vancouver, BC, Canada, V6T 1Z4, (604) 822–4898

Dr. Daniel Weary, Associate Dean, Graduate Studies; Professor, Applied Biology; Animal Welfare Program; NSERC Industrial Research Chair in Animal Welfare, University of British Columbia, MCML 181 - 2357 Main Mall, Vancouver, BC, Canada, V6T 1Z4, (604) 822–3954

Dr. Ernest Hovingh, Extension Veterinarian, Pennsylvania State University, 111 Henning Building, University Park, PA 16802, (814) 863–8526

Dr. Jennifer Walker, Director, Dairy Stewardship, Dean Foods Company, 2711 North Haskell Avenue, Suite 3400, Dallas, TX 75204, (214) 721–1323

Dr. Dale Moore, Clinical Professor and Director, Veterinary Medicine Extension, Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Washington State University, PO Box 646610, Pullman WA 99164, (509) 335–7494

Dr. Amy Stanton, Dairy Cattle Wellbeing Specialist, Department of Dairy Science, University of Wisconsin – Madison, 1675 Observatory Drive, Madison, WI 53706, (608) 890–4781

Dr. Thomas Earleywine, Director of Nutritional Services, Land O'Lakes Animal Milk Products, PO Box 64404, MS 5710, St Paul, MN 55164-0404, (651) 494–5009

Dr. Jud Heinrichs, Professor of Dairy Science, Pennsylvania State University, 324 Henning Building, University Park, PA 16802, (814) 863–3916.

Appendix A: NAHMS Dairy 2007, 2002 and 1996 Review of Response Rates

1. General Dairy Management Report (NASS) response rates:

	Dairy 2007		Dairy 2002		Dairy 1996	
Response category	**No. ops.**	**%**	**No. ops.**	**%**	**No. ops.**	**%**
Complete & VMO consent	1,077	30.3	1,438	37.1	1,603	35.5
Complete & refused consent	990	27.9	905	23.3	791	17.5
Complete & ineligible	127	3.6	118	3.0	148	3.3
Subtotal	*2,194*	*61.9*	*2,461*	*63.4*	*2,542*	*56.3*
No milk cows	214	6.0	227	5.9	646	14.3
Out of business	111	3.1	183	4.7	173	3.8
Out of scope	6	0.2	45	1.2	22	0.5
Subtotal	*2,525*	*71.2*	*2,916*	*75.2*	*3,383*	*74.9*
Refusal	785	22.1	821	21.2	969	21.5
Inaccessible	118	3.3	137	3.5	164	3.6
Other	126	3.5	2	0.1	-	-
Total	*3,554*	*100.0*	*3,876*	*100.0*	*4,516*	*100.0*

2. VMO initial visit response rates:

	Dairy 2007		Dairy 2002		Dairy 1996	
Response category	**No. ops.**	**%**	**No. ops.**	**%**	**No. ops.**	**%**
Complete	582	54.0	1,013	70.4	1,219	76.0
Refusal	380	35.3	292	23.3	339	21.2
Ineligible	111	10.3	14	1.0	29	1.8
Inaccessible	4	0.4	76	5.3	16	1.0
Total	*1,077*	*100.0*	*1,438*	*100.0*	*1,603*	*100.0*

Appendix B: NAHMS Dairy 2014 Estimated Response Rates

Phase	Response category	Percentage in phase	Expected counts
Phase I CATI			
	Zero on hand	20.0	100
	Complete	55.0	275
	Refusal	25.0	125
	Total	100.0	500
Phase I Enumerator			
	Complete and agree to continue	33.3	1,000
	Complete and do not agree to continue	25.7	770
	Complete Phase I enumerator	59.0	1,770
	Zero on hand or out of business	10	300
	Out of scope	1.0	30
	Refusal	30.0	900
	Total	100.0	3,000
Phase II VMO			
	Complete	55.0	550
	Refusal	35.0	350
	Ineligible/inaccessible	10.0	100
	Total	100.0	1,000

Appendix C: Total U.S. Dairy Operations* and Dairy Cow Inventory by State**

State	Total operations	Percent of U.S. total	Percent of 17 States	Cow inventory	Percent of U.S. total	Percent of 17 States
AL	157	0.22		10,000	0.11	
AK	28	0.04		500	0.01	
AZ	182	0.26		190,000	2.06	
AR	339	0.49		11,000	0.12	
CA***	2,165	3.10	3.81	1,780,000	19.29	23.77
CO***	449	0.64	0.79	131,000	1.42	1.75
CT	269	0.38		18,500	0.20	
DE	83	0.12		5,000	0.05	
FL	422	0.60		120,000	1.30	
GA	639	0.91		78,000	0.85	
HI	15	0.02		1,900	0.02	
ID***	811	1.16	1.43	581,000	6.30	7.76
IL	1,217	1.74		99,000	1.07	
IN***	2,023	2.89	3.56	175,000	1.90	2.34
IA***	2,390	3.42	4.20	205,000	2.22	2.74
KS	776	1.11		123,000	1.33	
KY***	2,277	3.26	4.01	75,000	0.81	1.00
LA	298	0.43		18,000	0.20	
ME	479	0.69		32,000	0.35	
MD	663	0.95		52,000	0.56	
MA	310	0.44		12,000	0.13	
MI***	2,647	3.79	4.66	371,000	4.02	4.95
MN***	5,148	7.37	9.06	465,000	5.04	6.21
MS	177	0.25		14,000	0.15	
MO***	2,621	3.75	4.61	93,000	1.01	1.24
MT	385	0.55		14,000	0.15	
NE	493	0.71		56,000	0.61	
NV	56	0.08		29,000	0.31	
NH	225	0.32		14,000	0.15	
NJ	152	0.22		7,500	0.08	
NM	272	0.39		335,000	3.63	
NY***	5,683	8.13	10.00	610,000	6.61	8.15
NC	463	0.66		45,000	0.49	
ND	402	0.58		18,000	0.20	
OH***	3,650	5.22	6.42	270,000	2.93	3.61
OK	981	1.40		52,000	0.56	
OR	596	0.85		123,000	1.33	
PA***	8,333	11.92	14.66	540,000	5.85	7.21
RI	39	0.06		1,100	0.01	
SC	106	0.15		16,000	0.17	

State	Total operations	Percent of U.S. total	Percent of 17 States	Cow inventory	Percent of U.S. total	Percent of 17 States
SD	656	0.94		90,000	0.98	
TN	1,230	1.76		50,000	0.54	
TX***	1,293	1.85	2.27	435,000	4.71	5.81
UT	450	0.64		90,000	0.98	
VT***	1,219	1.74	2.14	133,000	1.44	1.78
VA***	1,154	1.65	2.03	96,000	1.04	1.28
WA***	817	1.17	1.44	263,000	2.85	3.51
WV	370	0.53		10,000	0.11	
WI***	14,158	20.26	24.91	1,265,000	13.71	16.89
WY	122	0.17		6,000	0.07	
17 States	56,838	81.32	100.00	7,488,000	81.13	100.00
U.S. Total	69,890	100.00		9,229,500	100.00	

* NASS 2007 Census of Agriculture

** NASS 2012 Inventory from Cattle Report, February 2013

*** 17 States selected for Dairy 2014 study

Appendix D: Allocation of Dairy Farms To Be Selected by State

State	Number of farms with fewer than 30 cows	Number of farms with 30 or more cows
California	15	393
Colorado	12	49
Idaho	9	154
Indiana	31	97
Iowa	28	125
Kentucky	39	68
Michigan	36	156
Minnesota	28	241
Missouri	47	78
New York	41	281
Ohio	40	158
Pennsylvania	48	299
Texas	21	128
Vermont	11	84
Virginia	16	63
Washington	13	90
Wisconsin	67	537
Total	**502**	**3,001**