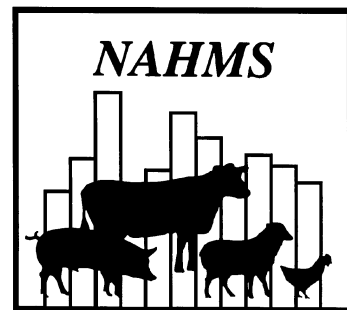


National Swine Survey

**Morbidity/Mortality and
Health Management of Swine
in the United States**

January 1992



Acknowledgements

This report has been prepared from material received and analyzed by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Animal Health Monitoring System (NAHMS). Specimen analyses were performed by the National Veterinary Services Laboratory in Ames, Iowa.

The National Swine Survey was a cooperative effort between State and Federal animal health officials, university researchers, and extension personnel. NAHMS wants to thank the State and Federal Veterinary Medical Officers (VMO's) who visited the farms and collected the data.

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Executive Summary

A National survey on swine health was conducted by the National Animal Health Monitoring System (NAHMS); USDA:APHIS:Veterinary Services from December 1989 through January 1991. The survey design was developed in collaboration with the National Agricultural Statistics Service (NASS) who provided list and area sampling frames. The sample was statistically designed to provide inferences about the nation's hog population. The sample represented 95 percent of the United States' swine population.

A general farm management and policy questionnaire was completed by 1,661 producers. The data were collected by enumerators of the National Association of State Departments of Agriculture (NASDA). Next, producers were enrolled in the monitoring phase of the program by State and federal Veterinary Medical Officers (VMO's). Producers were enrolled in the program on a monthly basis throughout the year. A diary of illnesses, deaths, and treatment activities was maintained for each sow and litter in the farrowing facility over the three-month monitoring period.

Information on farm biosecurity measures, facility characteristics, disease history, routine preventive/treatment practices and economics were collected via three separate questionnaires over the three-month monitoring period for each farm. There were 712 producers that completed the entire monitoring phase.

A total of 33,519 sows and gilts were monitored during the National Swine Survey. Of the piglets born to those females, 313,576 were born alive. Per litter estimates for the National population represented by the survey show 9.9 piglets are born alive per litter and 8.4 are weaned. Fifty-seven (57) percent of all illnesses reported for piglets born and weaned are attributed to scours. Forty-three (43) percent of the deaths in the same piglets are due to laid on, or crushing. Water quality examination on participating farms show that nearly 15 percent of swine farms have high nitrate levels exceeding human limits established by the Environmental Protection Agency (EPA).

Overview

The descriptive tables are divided into two major parts:

Part I contains results from the farms that completed the three-month monitoring program.

Part II contains results from the original 1,661 farms (monitored and nonmonitored farms).

Parts I and II are further divided as shown below:

A: The Sample Profile contains information that describes characteristics of the farms in the sample.

B - G: These sections show population estimates, such as averages and proportions which have been weighted to represent the National hog population. Most of the estimates are provided with a measure of variability called the standard error and denoted by (+/-). Chances are 95 out of 100 that these survey estimates will be within plus or minus two standard errors of the average estimates derived from repeating the survey for all possible samples of the population.

If you have questions about this report contact NAHMS at:

National Animal Health Monitoring System
USDA:APHIS:VS
555 South Howes
Fort Collins, Colorado 80521
(970) 490-8000

A Technical Report containing details on the methodology employed during the National Swine Survey is also available.

Descriptive Findings - Monitored Farms

I - Results of farms participating in the three-month monitoring period

A. Sample profile

1. Descriptive statistics of farms

a. <u>Female breeding herd size^a</u>	<u># Farms</u>
0	1
1-49	180
50-99	177
100-499	301
500+	<u>53</u>
Total	712
b. <u>Type of operation</u>	<u># Farms</u>
Farrow-to-finish	557
Grower/finisher	3
Feeder pig producer	132
Breeding stock producer	<u>20</u>
Total	712
c. <u>Type of farrowing management</u>	<u># Farms</u>
All-in, all-out	385
Continuous farrowing	<u>327</u>
Total	712

2. Animals monitored

a. Number of females (sows and gilts):	<u># Animals</u>
Total monitored	33,519
Farrowed during study period	27,932
Weaned during study period	26,920
Cohort ^b	21,712
Died during study period	216
b. Number of piglets:	
Total born alive	313,576
Total weaned	224,370
Cohort ^b , plus net fostered	213,910
Died	42,504

^aIncludes replacement gilts not yet bred, but of breeding age; sows and gilts bred and gestating; sows nursing piglets; sows weaned less than two weeks, but not rebred; and open sows weaned two weeks or more (excludes cull sows).

^bCohort animals are those that farrowed and weaned during the study.

A. Sample profile (continued)

c. Number of cases of illness/conditions among piglets from cohort^a littersAge Group by Number of Days

Illness/Condition	1-3	4-7	8-14	15-21	22-28	29+	Total	% of
							#	Total
Scours	6,177	3,628	3,475	1,161	303	119	14,863	58.2
Nervous system	66	32	27	21	12	9	167	0.7
Deformities	356	51	18	1	7	2	435	1.7
Lame or joint	253	229	152	104	39	18	795	3.1
Respiratory	54	67	133	85	31	26	396	1.5
Other known diseases	2,680	626	594	281	106	52	4,339	17.0
Unknown diseases	1,398	1,141	1,126	523	232	141	4,561	17.8
Total cases	10,984	5,774	5,525	2,176	730	367	25,556	100.0
% of Total cases	43.0	22.6	21.6	8.5	2.9	1.4	100.0	—

d. Number of deaths among piglets from cohort^a littersAge Group by Number of Days

Illness/Condition	1-3	4-7	8-14	15-21	22-28	29+	Total	% of
							#	Total
Scours	733	1,532	929	287	101	41	3,623	10.7
Nervous system	44	30	26	12	13	5	130	0.4
Deformities	309	65	16	2	6	2	400	1.2
Lame or joint	150	101	86	70	36	19	462	1.4
Respiratory	30	31	33	30	19	17	160	0.5
Laid on	9,347	2,960	1,565	606	204	84	14,766	43.8
Starvation	2,103	2,462	1,320	402	175	67	6,529	19.4
Other known disease	1,901	543	424	183	105	44	3,200	9.5
Unknown disease	1,331	1,112	1,101	506	231	139	4,420	13.1
Total cases	15,948	8,836	5,500	2,098	890	418	33,690	100.0
% of Total cases	47.3	26.2	16.3	6.2	2.7	1.3	100.0	—

3. Biological samples

a. Water:

Number of producers participating 702

^a Cohort animals are those that farrowed and weaned during the study.

A. Sample profile (continued)

b. Blood:	<u>Number</u>
Number of producers participating	393
Average number of samples tested per farm	8.7
Percent of farms with samples collected by:	<u>Percent</u>
VMO	93.9
Private practitioner	6.1
Owner	1.5
Other	<u>2.3</u>
Total	103.8 ^a
Percent of farms participating in blood collection using randomly selected sows	77.4

B. National population estimates^b based on data collected from monitored farms

1. Farrowing and weaning productivity

a. Per litter productivity

<u>Measure</u>	<u>All Sows</u>		<u>Cohort</u> ^d	
	<u>That Farrowed</u> ^c	<u>Standard Error</u>		<u>Error</u>
Born per litter	10.77	(±.06)	10.77	(±.06)
Born alive per litter	9.88	(±.05)	9.89	(±.05)
% born alive per litter	91.79	(±.21)	91.86	(±.25)
Stillborn per litter	0.74	(±.02)	.73	(±.03)
% stillborn per litter	6.90	(±.18)	6.81	(±.22)
Mummies per litter	0.14	(±.01)	.14	(±.02)
% mummies per litter	1.31	(±.12)	1.33	(±.15)
Net fostering per litter	—	(±—)	-.03	(±.03)
Deaths per litter			1.48	(±.08)
% preweaning mortality	—	(±—)	15.03	(±.83)
Age at death	—	(±—)	5.99	(±.16)
% of litters with a death	—	(±—)	62.72	(±1.92)
Weaned per litter	8.34	(±.09)	8.38	(±.08)
% weaned	—	(±—)	84.97	(±.83)
Age at weaning ^e	—	(±—)	28.79	(±.57)
Weight at weaning ^e	—	(±—)	15.31	(±.29)
b. Management productivity:	<u># Days</u>	<u>Standard Error</u>		
Days entry to farrowing	6.2	(±.2)		
Days of re-breeding interval	4.3	(±.4)		

^a Some samples were collected jointly by more than one person.

^b The sample represented 95 percent of the swine population.

^c Values are from all litters farrowing, except for “Weaned per litter” which was calculated from all litters weaned.

^d Results were derived from cohort animals; those that farrowed and weaned during the study.

^e Values were from litters where both age (days) and weight (pounds) were reported.

B. National population estimates based on data collected from monitored farms (continued)

2. Farrowing and weaning productivity by parity for cohorta sows and gilts

a. Per litter productivity

Measure	Parity Number						Unknown
	1	2	3	4	5	6	
Number of females ^b	4,853	4,019	3,522	2,986	1,671	2,415	2,246
Born per litter	9.95	10.45	11.23	11.34	11.71	11.40	10.60
Standard error	(±.08)	(±.14)	(±.11)	(±.08)	(±.10)	(±.10)	(±.20)
Born alive per litter	9.17	9.75	10.38	10.35	10.67	10.16	9.65
Standard error	(±.09)	(±.10)	(±.11)	(±.08)	(±.08)	(±.07)	(±.17)
% born alive/litter	92.14	93.30	92.46	91.24	91.09	89.16	91.04
Standard error	(±.45)	(±.46)	(±.35)	(±.40)	(±.41)	(±.43)	(±.71)
Stillborn per litter	0.65	0.58	0.70	0.84	0.91	1.04	0.81
Standard error	(±.04)	(±.05)	(±.03)	(±.05)	(±.06)	(±.05)	(±.07)
% stillborn per litter	6.49	5.54	6.21	7.39	7.76	9.11	7.65
Standard error	(±.41)	(±.37)	(±.29)	(±.42)	(±.43)	(±.36)	(±.56)
Mummies per litter	0.14	0.12	0.15	0.16	0.14	0.20	0.14
Standard error	(±.02)	(±.02)	(±.02)	(±.05)	(±.01)	(±.02)	(±.04)
% mummies/litter	1.38	1.15	1.33	1.37	1.15	1.73	1.31
Standard error	(±.19)	(±.18)	(±.20)	(±.40)	(±.12)	(±.17)	(±.40)
Net fostering per litter	0.18	0.16	-0.07	-0.09	-0.48	-0.43	-0.19
Standard error	(±.06)	(±.06)	(±.04)	(±.04)	(±.08)	(±.09)	(±.08)
Deaths per litter	1.38	1.35	1.60	1.59	1.73	1.48	1.55
Standard error	(±.09)	(±.19)	(±.07)	(±.08)	(±.17)	(±.21)	(±.13)
% preweaning mortality	14.68	13.65	15.52	15.45	17.03	15.16	16.33
Standard error	(±.87)	(±1.84)	(±.64)	(±.84)	(±1.50)	(±2.0)	(±1.37)
Age at death	5.90	6.45	5.51	5.79	5.50	6.11	6.76
Standard error	(±.25)	(±.48)	(±.24)	(±.22)	(±.24)	(±.24)	(±.57)
% of litters with death	58.03	59.45	65.82	68.84	69.92	62.30	63.70
Standard error	(±2.21)	(±3.63)	(±1.80)	(±1.79)	(±3.86)	(±5.78)	(±2.98)
Weaned per litter	7.98	8.55	8.71	8.68	8.45	8.26	7.92
Standard error	(±.09)	(±.17)	(±.12)	(±.11)	(±.10)	(±.16)	(±.19)
% weaned	85.32	86.35	84.48	84.55	82.97	84.84	83.67
Standard error	(±.87)	(±1.85)	(±.64)	(±.84)	(±1.50)	(±2.00)	(±1.37)
Age at weaning ^c	29.44	27.51	28.94	30.39	27.09	26.43	32.51
Standard error	(±.58)	(±1.15)	(±.53)	(±.81)	(±.82)	(±1.16)	(±1.19)
Weight at weaning ^c	15.28	14.55	15.32	15.71	15.53	14.93	17.58
Standard error	(±.29)	(±.65)	(±.41)	(±.40)	(±.53)	(±.36)	(±.75)

^a Results were derived from cohort animals; those that farrowed and weaned during the study.

^b Actual study sample values; not population estimates.

^c Values are from litters where both age (days) and weight (pounds) are reported.

B. National population estimates based on data collected from monitored farms (continued)

3. Piglet illness/conditions by age

a. Cases per 100 piglets per week

Illness/Condition	Actual Cases Reported During Study	Age Group by Number of Days					
		1-3	4-7	8-14	15-21	22-28	29+
Scours	19,117	6.967	3.462	1.830	0.745	0.273	0.171
Standard error		(±.996)	(±.415)	(±.237)	(±.197)	(±.051)	(±.050)
Nervous system	210	0.042	0.021	0.016	0.007	0.009	0.007
Standard error		(±.010)	(±.008)	(±.006)	(±.002)	(±.004)	(±.004)
Deformities	543	0.275	0.023	0.004	0.001	0.004	0.001
Standard error		(±.039)	(±.005)	(±.001)	(±.001)	(±.002)	(±.001)
Lame or joint	1,077	0.433	0.571	0.237	0.062	0.037	0.015
Standard error		(±.163)	(±.386)	(±.154)	(±.012)	(±.009)	(±.005)
Respiratory	772	0.107	0.082	0.074	0.072	0.023	0.018
Standard error		(±.025)	(±.020)	(±.020)	(±.032)	(±.010)	(±.009)
Other known diseases	5,486	3.766	0.451	0.316	0.235	0.097	0.058
Standard error		(±1.146)	(±.055)	(±.056)	(±.042)	(±.015)	(±.014)
Unknown diseases	5,660	1.282	0.984	0.511	0.289	0.163	0.125
Standard error		(±.090)	(±.071)	(±.041)	(±.027)	(±.019)	(±.025)
Number of cases ^a	32,865	13,264	7,658	7,401	2,821	1,077	644
b. Piglet observation days ^a	—	835,647	1,031,533	1,728,970	1,600,476	1,119,299	946,038

^a Actual study sample values; not population estimates.

B. National population estimates based on data collected from monitored farms (continued)

c. Percent of cohort^a illness/conditions by age group

Age Group by Number of Days

Illness/Condition	1-3	4-7	8-14	15-21	22-28	29+	% Total Illnesses
Scours	42.1	23.1	23.0	9.1	1.9	0.8	100.0
Standard error	(±2.5)	(±3.1)	(±2.2)	(±2.1)	(±.5)	(±.3)	
Nervous system	35.5	18.6	26.9	7.0	8.3	3.7	100.0
Standard error	(±7.4)	(±4.7)	(±6.9)	(±2.4)	(±3.6)	(±1.9)	
Deformities	87.1	9.0	2.7	0.2	0.8	0.2	100.0
Standard error	(±2.7)	(±2.1)	(±.9)	(±.2)	(±.5)	(±.2)	
Lame or joint	33.8	19.8	34.1	8.3	2.7	1.3	100.0
Standard error	(±2.7)	(±2.6)	(±8.4)	(±2.5)	(±1.5)	(±.9)	
Respiratory	19.0	19.8	30.4	20.4	5.9	4.5	100.0
Standard error	(±5.5)	(±2.8)	(±4.0)	(±4.6)	(±3.0)	(±2.8)	
Other known diseases	69.2	9.7	11.5	6.7	2.0	0.9	100.0
Standard error	(±6.3)	(±2.5)	(±3.0)	(±1.4)	(±.7)	(±.3)	
Unknown diseases	29.0	27.8	23.7	12.4	4.3	2.8	100.0
Standard error	(±1.7)	(±1.5)	(±1.2)	(±1.0)	(±.6)	(±.6)	
% Total illnesses	45.2	20.8	21.2	9.2	2.4	1.2	=100.0
Standard error	(±2.4)	(±2.5)	(±1.1)	(±1.1)	(±.4)	(±.2)	

d. Percent of cohort^a illness/conditions by attributed illness

Age Group by Number of Days

Illness/Condition	1-3	4-7	8-14	15-21	22-28	29+	% Total Illnesses
Scours	52.7	63.0	61.1	56.1	44.7	37.8	56.6
Standard error	(±4.9)	(±3.0)	(±5.6)	(±6.5)	(±6.5)	(±9.6)	(±2.4)
Nervous system	0.4	0.4	0.6	0.4	1.6	1.4	0.4
Standard error	(±.1)	(±.1)	(±.2)	(±.2)	(±.8)	(±.9)	(±.1)
Deformities	2.1	0.5	0.1	0.0	0.4	0.2	1.1
Standard error	(±.5)	(±.1)	(±.1)	(±—)	(±.2)	(±.2)	(±.2)
Lame or joint	3.6	4.6	7.8	4.4	5.3	5.0	4.8
Standard error	(±1.5)	(±1.4)	(±5.2)	(±1.2)	(±1.3)	(±2.4)	(±2.1)
Respiratory	0.7	1.6	2.4	3.7	4.1	6.0	1.7
Standard error	(±.2)	(±.5)	(±.7)	(±1.3)	(±1.9)	(±3.2)	(±.3)
Other known diseases	30.7	9.4	10.9	14.7	16.9	14.7	20.1
Standard error	(±6.4)	(±1.4)	(±2.1)	(±2.7)	(±3.4)	(±3.6)	(±3.4)
Unknown diseases	9.8	20.5	17.1	20.7	27.0	34.9	15.3
Standard error	(±1.6)	(±1.9)	(±2.2)	(±4.5)	(±4.1)	(±6.7)	(±1.8)
% Total illnesses	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^a Results were derived from cohort animals; those that farrowed and weaned during the study.

B. National population estimates based on data collected from monitored farms (continued)

4. Piglet deaths by age

a. Cases per 100 piglets per week

Attributed Cause	Actual Cases Reported During Study	Age Group by Number of Days					
		1-3	4-7	8-14	15-21	22-28	29+
Scours	4,538	0.858	1.347	0.440	0.133	0.087	0.046
Standard error		(±.115)	(±.197)	(±.073)	(±.018)	(±.018)	(±.013)
Nervous system	167	0.035	0.020	0.012	0.006	0.009	0.003
Standard error		(±.009)	(±.008)	(±.004)	(±.002)	(±.004)	(±.001)
Deformities	503	0.233	0.034	0.008	0.002	0.006	0.001
Standard error		(±.033)	(±.007)	(±.003)	(±.002)	(±.002)	(±.001)
Lame or joint	594	0.145	0.114	0.043	0.062	0.028	0.016
Standard error		(±.022)	(±.024)	(±.008)	(±.022)	(±.005)	(±.004)
Respiratory	226	0.051	0.028	0.023	0.017	0.011	0.013
Standard error		(±.018)	(±.015)	(±.009)	(±.003)	(±.004)	(±.007)
Laid on	18,574	9.588	2.309	0.739	0.310	0.157	0.076
Standard error		(±.774)	(±.138)	(±.039)	(±.025)	(±.025)	(±.013)
Starvation	8,332	2.332	2.033	0.638	0.209	0.155	0.068
Standard error		(±.252)	(±.182)	(±.079)	(±.025)	(±.029)	(±.012)
Other known diseases	4,094	1.939	0.395	0.217	0.157	0.088	0.054
Standard error		(±.226)	(±.047)	(±.031)	(±.039)	(±.016)	(±.013)
Unknown diseases	5,476	1.228	0.958	0.506	0.283	0.161	0.122
Standard error		(±.089)	(±.07)	(±.04)	(±.027)	(±.019)	(±.024)
Number of cases ^a	42,504	19,938	11,073	6,900	2,687	1,231	675

b. Piglet observation days

	Actual Cases Reported During Study	Age Group by Number of Days					
		1-3	4-7	8-14	15-21	22-28	29+
	—	835,647	1,031,533	1,728,970	1,600,476	1,119,299	946,038

^a Actual study sample values; not population estimates.

B. National population estimates based on data collected from monitored farms (continued)

c. Percent of deaths among piglets of cohort^a litters by age group

Age Group by Number of Days

<u>Attributed Cause</u>	<u>1-3</u>	<u>4-7</u>	<u>8-14</u>	<u>15-21</u>	<u>22-28</u>	<u>29+</u>	<u>Total Deaths</u>
Scours	22.7	43.7	23.8	6.1	2.6	1.1	100.0
Standard error	(±2.6)	(±2.3)	(±2.6)	(±.8)	(±.7)	(±.5)	
Nervous system	36.0	21.3	23.5	5.8	10.9	2.5	100.0
Standard error	(±7.3)	(±6.4)	(±6.4)	(±2.2)	(±4.9)	(±1.8)	
Deformities	76.0	14.6	5.9	1.8	1.5	0.2	100.0
Standard error	(±5.4)	(±2.6)	(±2.9)	(±1.5)	(±.9)	(±.2)	
Lame or joint	26.1	22.5	17.2	23.6	6.5	4.1	100.0
Standard error	(±4.1)	(±4.4)	(±3.2)	(±9.0)	(±1.6)	(±1.5)	
Respiratory	22.2	22.5	19.7	19.0	8.3	8.3	100.0
Standard error	(±8.8)	(±9.6)	(±4.8)	(±3.7)	(±3.8)	(±5.4)	
Laid on	64.2	19.5	10.5	4.0	1.3	0.5	100.0
Standard error	(±1.6)	(±.9)	(±.7)	(±.4)	(±.2)	(±.1)	
Starvation	35.6	36.8	18.7	5.9	2.1	0.9	100.0
Standard error	(±1.6)	(±1.4)	(±1.3)	(±.5)	(±.2)	(±.2)	
Other known diseases	60.7	14.9	13.1	6.7	3.2	1.4	100.0
Standard error	(±4.0)	(±1.8)	(±2.0)	(±1.2)	(±.7)	(±.4)	
Unknown diseases	28.3	27.9	24.1	12.4	4.4	2.9	100.0
Standard error	(±1.8)	(±1.5)	(±1.3)	(±1.0)	(±.7)	(±.6)	
% Total deaths	48.2	26.3	15.7	6.3	2.3	1.2	=100.0
Standard error	(±1.4)	(±.8)	(±.7)	(±.5)	(±.2)	(±.2)	

^a Results were derived from cohort animals; those that farrowed and weaned during the study.

B. National population estimates based on data collected from monitored farms (continued)

d. Percent of deaths among piglets of cohort^a litters by attributed cause of death
Age Group by Number of Days

Attributed Cause	1-3	4-7	8-14	15-21	22-28	29+	% Total Deaths
Scours	5.1	18.0	16.4	10.4	12.2	10.5	10.8
Standard error	(±.7)	(±1.9)	(±2.0)	(±1.5)	(±3.1)	(±4.0)	(±.9)
Nervous system	0.3	0.3	0.5	0.3	1.5	0.7	0.3
Standard error	(±.1)	(±.1)	(±.2)	(±.1)	(±.8)	(±.6)	(±.1)
Deformities	1.4	0.5	0.3	0.2	0.5	0.2	0.9
Standard error	(±.2)	(±.1)	(±.2)	(±.2)	(±.4)	(±.1)	(±.1)
Lame or joint	0.8	1.3	1.6	5.6	4.2	5.3	1.5
Standard error	(±.1)	(±.3)	(±.4)	(±2.2)	(±1.0)	(±1.6)	(±.2)
Respiratory	0.2	0.5	0.7	1.6	1.8	3.7	0.5
Standard error	(±.1)	(±.3)	(±.2)	(±.3)	(±.8)	(±2.3)	(±.1)
Laid on	57.5	32.1	28.8	27.1	24.1	19.3	43.2
Standard error	(±1.4)	(±1.2)	(±2.0)	(±1.8)	(±3.5)	(±3.5)	(±1.2)
Starvation	14.7	27.9	23.6	18.8	17.7	16.0	19.9
Standard error	(±1.2)	(±1.7)	(±2.1)	(±2.6)	(±2.1)	(±2.6)	(±1.2)
Other known diseases	12.3	5.5	8.1	10.3	13.5	11.9	9.8
Standard error	(±1.3)	(±.7)	(±1.1)	(±1.6)	(±2.2)	(±2.9)	(±.8)
Unknown diseases	7.7	13.9	20.0	25.7	24.5	32.4	13.1
Standard error	(±.7)	(±1.4)	(±2.0)	(±1.9)	(±2.8)	(±4.3)	(±1.1)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5. Piglet preventive/treatment action (cohort^a piglets)

a. Percent of piglets from cohort ^a litters treated ^b :	Percent	Standard Error
Vaccination	44.0	(±4.6)
Deworming	5.6	(±1.3)
Mange/lice	5.9	(±1.1)
Clip teeth in farrowing facility	84.4	(±1.9)
Dock tails in farrowing facility	86.5	(±1.4)
Castrate in farrowing facility	40.6	(±.7)
Iron shots	89.0	(±2.0)
Antibiotic shots	60.4	(±5.5)
Oral antibiotics	10.4	(±1.5)
Coccidiostats	1.4	(±.5)
Other	11.3	(±.2)

^a Results were derived from cohort animals born alive plus net fosterings; those that farrowed and weaned during the study.

^b Multiple treatments on the same piglet were counted separately.

B. National population estimates based on data collected from monitored farms (continued)

6. Female illness, death, and culling

a. Cases per 25 head per month (30.4 days)

<u>Illness</u>	<u>Sows</u>	<u>Gilts</u>	<u>Both</u>
Nonfarrowing reproductive problems	0.159	0.141	0.154
Standard error	(±.024)	(±.038)	(±.022)
Respiratory system	0.012	0.015	0.013
Standard error	(±.004)	(±.008)	(±.004)
Lame or joint	0.125	0.121	0.124
Standard error	(±.021)	(±.024)	(±.017)
Scours	0.095	0.128	0.103
Standard error	(±.032)	(±.043)	(±.030)
Milking problems	0.992	1.070	1.010
Standard error	(±.157)	(±.213)	(±.139)
Other known diseases	0.166	0.284	0.195
Standard error	(±.027)	(±.086)	(±.032)
Unknown diseases	0.079	0.067	0.076
Standard error	(±.013)	(±.013)	(±.032)
b. Deaths per 25 head per month (30.4 days)	0.180	0.151	0.173
Standard error	(±.0212)	(±.0305)	(±.0186)

c. Female observation days^a

<u>Illness</u>	<u>Sows</u>	<u>Gilts</u>
All (except milking problems)	834,837	257,742
Milking problems	632,452	185,468

d. Percent of cohort^b females:

	<u>Percent</u>	<u>Standard Error</u>
Farrowing problem	1.8	(±.2)
Death	.9	(±.1)
Culled	12.4	(±.3)

^a Actual study sample values; not population estimates.^b Results were derived from cohort animals born alive plus net fosterings; those that farrowed and weaned during the study.

B. National population estimates based on data collected from monitored farms (continued)

7. Female preventive/treatment action (cohorta females)

	<u>Percent</u>	Standard Error_
a. Percent of cohort ^a females treated ^b :		
Vaccination	32.5	(±2.5)
Deworming	17.9	(±2.1)
Mange/lice	16.2	(±2.1)
Antibiotics (any route)	30.6	(±2.1)
In feed	6.2	(±4.4)
In water	<0.1	(±1.0)
Injection	25.6	(±0)
Coccidiostats	0.6	(±4.4)
Other	6.6	(±1.3)

8. Serum neutralization test results

a. Transmissible gastroenteritis (TGE)

	<u>Percent</u>	Standard Error_
Percent of farms with at least one sample testing positive ^c for TGE	35.8	(±5.6)
Percent of farms with at least one sample equalling or exceeding 1:8 titer and at least one sow vaccinated for TGE	13.0	(±3.1)

b. Swine influenza (INF)

Percent of farms with at least one sample testing positive for INF	57.5	(±6.7)
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c. Encephalomyocarditis (EMC)

Percent of farms with at least one sample testing positive for EMC	21.1	—
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^a Results were derived from cohort animals; those that farrowed and weaned during the study.

^b Multiple treatments on the same females were counted one time only.

^c Individual titer $\geq 1:8$ is considered positive for TGE.

^d Individual titer $\geq 1:20$ is considered positive for INF.

^e Individual titer $\geq 1:38$ is considered positive for EMC. Differences of opinion exist regarding the actual level consistent with infection. Preliminary analyses using a $\geq 1:8$ level, determined positive by Iowa State University staff, showed 65.3 percent of herds infected (standard error: ± 4.4).

B. National population estimates based on data collected from monitored farms (continued)

9. Water quality test results

a. Average level of compound by water source (includes only those samples where two samples were taken from the same source)

Compound	All	Source of Water					Other
		Pond/ Lake	River/ Creek	Rural System	City	Well	
Number of Farms	692	20	4	32	30	594	12
		Parts per Million (ppm)					
Fluoride	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Chloride	15.39	10.17	12.81	13.83	9.52	16.06	5.31
Standard error	(±1.96)	(±2.67)	(±2.53)	(±2.49)	(±1.57)	(±2.19)	(±1.88)
Nitrite	0.07	0.00	0.00	0.00	0.00	0.05	1.11
Standard error	(±0.03)	(±—)	(±—)	(±—)	(±—)	(±0.02)	(±1.04)
Nitrate	19.09	1.75	36.26	9.46	6.82	20.47	8.57
Standard error	(±3.09)	(±0.96)	(±7.75)	(±2.02)	(±2.30)	(±3.47)	(±6.22)
Sulfate	116.43	20.83	4.18	74.57	38.43	126.06	18.15
Standard error	(±24.09)	(±5.45)	(±2.23)	(±14.48)	(±9.25)	(±28.09)	(±8.25)
Sodium	55.45	11.82	11.41	44.21	20.46	59.44	11.49
Standard error	(±6.93)	(±2.15)	(±1.56)	(±13.35)	(±3.42)	(±7.46)	(±1.71)
Potassium	5.56	12.22	1.25	4.53	3.56	5.71	1.36
Standard error	(±0.61)	(±2.67)	(±0.19)	(±0.59)	(±0.57)	(±0.67)	(±0.56)
Calcium	82.68	27.55	19.07	66.33	48.73	86.91	46.57
Standard error	(±6.69)	(±5.58)	(±4.22)	(±6.70)	(±10.64)	(±7.91)	(±10.74)
Magnesium	38.72	14.90	15.23	29.72	28.13	40.46	21.61
Standard error	(±2.46)	(±3.52)	(±0.74)	(±3.60)	(±4.86)	(±2.88)	(±3.82)
Ammonia	0.23	0.44	0.00	0.04	0.02	0.24	0.08
Standard error	(±0.05)	(±0.27)	(±—)	(±0.03)	(±0.01)	(±0.05)	(±0.07)
Bromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Lithium	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Barium	0.13	0.00	0.00	0.06	0.04	0.14	0.03
Standard error	(±0.02)	(±—)	(±—)	(±0.02)	(±0.02)	(±0.03)	(±0.02)
Zinc	0.05	0.01	0.00	0.07	0.05	0.05	0.23
Standard error	(±0.01)	(±0.01)	(±—)	(±0.05)	(±0.03)	(±0.01)	(±0.10)
Phosphate	0.04	0.25	<0.01	0.12	0.03	0.03	0.11
Standard error	(±0.01)	(±0.07)	(±<.01)	(±0.06)	(±0.02)	(±0.01)	(±0.07)
Iron	0.06	0.15	0.00	0.00	0.01	0.06	0.04
Standard error	(±0.02)	(±0.05)	(±—)	(±—)	(±0.01)	(±0.02)	(±0.03)

B. National population estimates based on data collected from monitored farms (continued)

b. Average level of compound for well source by age of well (years)

Compound	<5	6-10	11-25	>25	Unknown
Number of Wells	78	81	204	194	20
	Parts per Million (ppm)				
Fluoride	<0.01	0.00	0.00	0.00	0.00
Standard error	(±<.01)	(±—)	(±—)	(±—)	(±—)
Chloride 14.72	25.29	13.01	16.52	19.32	
Standard error	(±3.91)	(±12.55)	(±2.38)	(±2.33)	(±7.19)
Nitrite	0.00	0.13	0.03	0.07	0.00
Standard error	(±—)	(±.09)	(±.03)	(±.06)	(±—)
Nitrate	17.13	10.43	20.10	22.77	31.17
Standard error	(±5.28)	(±2.75)	(±7.61)	(±4.31)	(±13.01)
Sulfate	54.16	101.65	189.36	91.29	37.91
Standard error	(±15.69)	(±27.37)	(±59.30)	(±19.56)	(±9.99)
Sodium	45.16	83.76	64.27	53.43	32.97
Standard error	(±9.40)	(±23.16)	(±16.31)	(±7.51)	(±15.15)
Potassium	5.67	5.37	7.20	4.73	2.79
Standard error	(±1.65)	(±1.26)	(±1.15)	(±.76)	(±.57)
Calcium	58.42	72.33	99.78	87.19	60.03
Standard error	(±9.27)	(±6.15)	(±15.54)	(±6.53)	(±7.68)
Magnesium	30.88	36.56	43.08	42.01	32.38
Standard error	(±4.88)	(±4.72)	(±4.21)	(±2.42)	(±4.39)
Ammonia	0.21	0.20	0.21	0.33	0.14
Standard error	(±.09)	(±.08)	(±.05)	(±.10)	(±.07)
Bromide	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)
Lithium	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)
Barium	0.10	0.10	0.15	0.16	0.11
Standard error	(±.02)	(±.02)	(±.06)	(±.02)	(±.05)
Zinc	0.19	0.07	0.03	0.03	0.02
Standard error	(±.08)	(±.05)	(±.01)	(±.01)	(±.02)
Phosphate	0.06	0.05	0.03	0.02	0.03
Standard error	(±.02)	(±.02)	(±.01)	(±.01)	(±.02)
Iron 0.11	0.13	0.05	0.04	0.05	
Standard error	(±.06)	(±.07)	(±.04)	(±.02)	(±.05)

B. National population estimates based on data collected from monitored farms (continued)

c. Average level of compound for well source by depth of well (feet)

Compound	<30	31-100	101-300	>300	Unknown
Number of Wells	40	193	250	70	24
	<u>Parts per Million (ppm)</u>				
Fluoride	0.00	0.00	0.00	<0.01	0.00
Standard error	(±—)	(±—)	(±—)	(±<.01)	(±—)
Chloride 20.26	13.41	12.81	28.82	35.52	
Standard error	(±5.04)	(±2.09)	(±2.38)	(±13.69)	(±15.23)
Nitrite	0.00	0.05	0.06	0.04	0.00
Standard error	(±—)	(±.05)	(±.04)	(±.03)	(±—)
Nitrate	42.20	24.79	13.82	4.46	36.28
Standard error	(±10.89)	(±6.22)	(±4.86)	(±1.38)	(±23.39)
Sulfate	102.22	140.74	106.05	191.83	40.82
Standard error	(±45.08)	(±56.46)	(±33.11)	(±64.14)	(±10.03)
Sodium	54.09	35.30	52.89	157.32	122.33
Standard error	(±15.73)	(±6.67)	(±6.66)	(±57.11)	(±75.64)
Potassium	8.47	5.22	5.31	8.37	2.56
Standard error	(±2.26)	(±.98)	(±.61)	(±3.36)	(±.66)
Calcium	79.66	97.26	82.53	75.03	58.12
Standard error	(±16.50)	(±13.84)	(±8.96)	(±12.93)	(±7.14)
Magnesium	37.08	42.27	40.82	35.83	30.22
Standard error	(±6.35)	(±3.30)	(±4.08)	(±4.53)	(±3.51)
Ammonia	0.06	0.27	0.25	0.35	0.05
Standard error	(±.03)	(±.09)	(±.06)	(±.16)	(±.02)
Bromide	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)
Lithium	0.00	0.00	0.00	0.00	0.00
Standard error	(±—)	(±—)	(±—)	(±—)	(±—)
Barium	0.10	0.19	0.12	0.03	0.19
Standard error	(±.02)	(±.07)	(±.02)	(±.01)	(±.07)
Zinc	0.09	0.05	0.03	0.09	0.01
Standard error	(±.07)	(±.02)	(±.01)	(±.04)	(±.01)
Phosphate	0.05	0.02	0.03	0.02	0.11
Standard error	(±.03)	(±.01)	(±.01)	(±.01)	(±.06)
Iron	0.12	0.03	0.09	0.02	0.19
Standard error	(±.09)	(±.01)	(±.04)	(±.01)	(±.14)

B. National population estimates based on data collected from monitored farms (continued)

d. Percentage of farms with water sample results exceeding human limits established by the Environmental Protection Agency (EPA)

Compound	Human Limit	% Farms > Limit ^a	Standard Error
Fluoride	4.00 ppm	0.0	(±—)
Nitrite	3.30 ppm	1.1	(±.5)
Nitrate	45.0 ppm	14.9	(±2.5)
Barium	1.00 ppm	1.7	(±1.2)

10. Biosecurity measures

a. Percentage of producers requiring separation/quarantine for new arrivals:

	N/A	Standard Error	No	Standard Error	Yes	Standard Error
Breeding females	35.1	(±2.6)	31.3	(±4.6)	33.6	(±3.8)
Breeding males	2.2	(±.4)	36.9	(±4.9)	60.9	(±4.8)
Feeder pigs	77.5	(±3.2)	20.3	(±3.8)	2.1	(±1.4)
Average days separated:			<u>Days</u>	<u>Standard Error</u>		
Breeding females			30.6	(±1.1)		
Breeding males			28.7	(±.7)		
Feeder pigs			34.5	(±3.8)		

b. Percentage of producers health testing new arrivals:

	N/A	Standard Error	No	Standard Error	Yes	Standard Error
Breeding females	34.8	(±2.8)	42.8	(±3.1)	22.3	(±2.1)
Breeding males	2.8	(±.7)	55.1	(±2.7)	42.1	(±2.7)
Feeder pigs	77.2	(±3.4)	22.0	(±3.4)	0.8	(±.4)

c. Percentage of producers requiring a shower of:

Employees	22.0	(±2.5)	75.6	(±2.7)	2.4	(±.9)
Feed delivery personnel	36.8	(±2.8)	62.1	(±2.9)	1.1	(±.7)
Hired livestock haulers	45.9	(±4.1)	53.0	(±4.2)	1.1	(±.7)
Other visitors	10.5	(±1.5)	86.0	(±2.0)	3.4	(±1.1)

d. Percentage of producers requiring a change of boots of:

Employees	22.5	(±2.5)	58.8	(±3.3)	18.6	(±2.6)
Feed delivery personnel	40.7	(±3.0)	48.6	(±3.3)	10.6	(±1.7)
Hired livestock haulers	52.8	(±3.9)	39.5	(±4.0)	7.7	(±1.4)
Other visitors	11.9	(±1.6)	54.8	(±4.3)	33.3	(±4.1)

e. Percentage of producers requiring a change of coveralls of:

Employees	22.7	(±2.4)	67.1	(±2.8)	10.3	(±1.7)
Feed delivery personnel	40.5	(±2.9)	54.5	(±3.2)	5.0	(±1.3)
Hired livestock haulers	52.9	(±4.1)	43.6	(±4.3)	3.5	(±1.1)
Other visitors	11.0	(±1.5)	71.4	(±3.0)	17.6	(±2.6)

^a Farms with at least one sample exceeding the human limit.

B. National population estimates based on data collected from monitored farms (continued)

f. Percent of producers requiring a footbath for employees who enter:

	<u>N/A</u>	<u>Standard Error</u>	<u>No</u>	<u>Standard Error</u>	<u>Yes</u>	<u>Standard Error</u>
Farrowing unit(s)	16.8	(±2.4)	73.5	(±2.8)	9.8	(±1.7)
Breeding/replacement unit(s)	16.8	(±2.4)	78.8	(±2.9)	4.4	(±1.4)
Swine operation	16.8	(±2.4)	77.8	(±2.9)	5.4	(±1.4)

g. Percent of producers requiring a footbath for:

Feed delivery personnel						
who enter swine operation	40.7	(±3.0)	55.1	(±3.2)	4.2	(±1.3)
Hired livestock haulers						
who enter swine operation	50.0	(±3.8)	47.6	(±4.0)	2.4	(±.7)

h. Percent of producers requiring a footbath for other visitors who enter:

Farrowing unit(s)	12.4	(±1.9)	73.3	(±2.5)	14.3	(±2.1)
Breeding/replacement unit(s)	12.8	(±1.8)	79.2	(±2.3)	8.1	(±1.6)
Swine operation	13.3	(±1.8)	77.3	(±2.3)	9.4	(±1.7)

i. Percent of producers requiring visitors not to have been on other

swine farms the same day	8.6	(±1.7)	48.5	(±3.6)	42.9	(±3.9)
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j. Percent of farms having swine-proof perimeter fence

around the swine operation	—	(±—)	87.0	(±2.9)	13.0	(±2.9)
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k. Percent of farms having the following animal classes on the premises:

<u>Animal Class</u>	<u>Percent</u>	<u>Standard Error</u>
Cattle	53.2	(±3.3)
Sheep	13.6	(±1.8)
Goats	4.3	(±1.3)
Horses	24.1	(±2.2)
Poultry	27.3	(±2.4)

l. Percent of farms allowing dog or cat access to the following facilities:

<u>Dog</u>	<u>N/A</u>	<u>Standard Error</u>	<u>No</u>	<u>Standard Error</u>	<u>Yes</u>	<u>Standard Error</u>
Farrowing	11.1	(±2.1)	48.7	(±3.5)	40.2	(±2.7)
Nursery	16.6	(±3.1)	48.8	(±3.5)	34.6	(±2.6)
Grower/finisher	18.9	(±2.1)	32.6	(±3.4)	48.5	(±3.2)
Breeding	11.7	(±2.1)	29.6	(±3.9)	58.7	(±3.2)
Gestation	11.1	(±2.1)	28.3	(±4.0)	60.6	(±3.3)
Feed storage	11.3	(±2.1)	40.7	(±3.5)	48.1	(±3.0)

B. National population estimates based on data collected from monitored farms (continued)

<u>Cat</u>	<u>N/A</u>	<u>Standard Error</u>	<u>No</u>	<u>Standard Error</u>	<u>Yes</u>	<u>Standard Error</u>
Farrowing	7.6	(±2.1)	40.0	(±3.4)	52.4	(±2.9)
Nursery	12.5	(±2.9)	41.1	(±3.7)	46.4	(±3.0)
Grower/finisher	13.0	(±2.3)	25.1	(±3.5)	61.9	(±3.6)
Breeding	7.5	(±2.1)	20.8	(±3.7)	71.7	(±3.1)
Gestation	7.0	(±2.0)	20.5	(±3.7)	72.6	(±3.2)
Feed storage	7.3	(±2.0)	28.8	(±3.2)	64.0	(±4.4)

m. Percent of farms where birds have access to the interior of the following facilities:

<u>Facility</u>	<u>N/A</u>	<u>Standard Error</u>	<u>No</u>	<u>Standard Error</u>	<u>Yes</u>	<u>Standard Error</u>
Farrowing	—	(±—)	65.0	(±3.1)	35.0	(±3.1)
Nursery	5.5	(±1.8)	54.8	(±3.0)	39.7	(±3.4)
Grower/finisher	8.6	(±1.9)	14.9	(±1.8)	76.5	(±2.2)
Breeding	.8	(±.6)	10.3	(±1.8)	88.9	(±1.9)
Gestation	.3	(±.2)	9.8	(±1.7)	89.9	(±1.7)
Feed storage	.3	(±.2)	42.2	(±2.9)	57.5	(±2.9)

n. Percent of farms with rodents seen in the following facilities:

Frequency of Sightings (Days per Week)

<u>Facility</u>	<u>7</u>	<u>3-5</u>	<u>1</u>	<u><1</u>	<u>N/A</u>
Farrowing	8.8	12.8	19.2	58.5	0.7
Standard Error	(±1.7)	(±1.8)	(±2.3)	(±3.5)	(±.4)
Nursery	7.4	12.2	17.7	57.5	5.2
Standard Error	(±1.2)	(±1.8)	(±2.2)	(±4.0)	(±1.6)
Grower/finisher	7.2	9.8	23.0	53.7	6.3
Standard Error	(±1.0)	(±1.6)	(±2.9)	(±3.4)	(±1.4)
Breeding	6.7	8.1	20.5	62.9	1.8
Standard Error	(±1.0)	(±1.8)	(±2.7)	(±4.0)	(±.7)
Gestation	6.9	8.1	19.1	64.7	1.2
Standard Error	(±1.0)	(±1.8)	(±2.4)	(±3.7)	(±.5)

o. Percent of farms using the following methods of rodent control:

<u>Control Method</u>	<u>Percent</u>	<u>Standard Error</u>
Cats	88.1	(±2.5)
Traps	14.2	(±2.7)
Bait/poison	78.5	(±4.1)
Other	6.1	(±1.4)

- B. National population estimates based on data collected from monitored farms (continued)
 p. Percent of farms by frequency of wildlife sightings within one mile of the farm:

Type of Wildlife	Frequency of Sightings			
	Frequently >4 times/mo.	Occasionally 1 time/mo.	Rarely 1-2 times/yr.	Never
Raccoon	14.5	24.9	47.1	13.5
Standard Error	(±2.3)	(±2.8)	(±3.6)	(±2.3)
Fox	3.7	12.3	50.1	34.0
Standard Error	(±1.2)	(±2.0)	(±5.1)	(±6.3)
Waterfowl	24.2	14.7	35.2	25.9
Standard Error	(±3.7)	(±1.6)	(±4.4)	(±3.4)
Pigeons	55.1	11.8	17.4	15.7
Standard Error	(±4.3)	(±1.4)	(±4.6)	(±4.0)
Skunk	6.1	16.7	58.2	19.0
Standard Error	(±1.3)	(±1.9)	(±3.3)	(±3.2)
Starling	67.7	17.8	5.9	8.6
Standard Error	(±4.7)	(±4.7)	(±1.4)	(±3.1)
Badger	1.6	1.8	16.5	80.1
Standard Error	(±.8)	(±.7)	(±2.5)	(±3.4)
Coyote	7.7	10.1	25.2	56.9
Standard Error	(±2.3)	(±2.5)	(±3.5)	(±7.1)
Wild pig	0.0	<0.1	1.0	98.9
Standard Error	(±—)	(±<.1)	(±.6)	(±.6)
Deer	39.1	29.3	22.8	8.7
Standard Error	(±4.5)	(±2.6)	(±2.2)	(±1.9)
Pheasant	33.1	25.0	17.5	24.4
Standard Error	(±3.5)	(±2.3)	(±2.1)	(±3.6)
Quail	17.1	24.1	27.1	31.7
Standard Error	(±3.2)	(±3.0)	(±4.6)	(±3.2)
Rabbit	61.6	28.4	7.4	2.7
Standard Error	(±3.5)	(±2.6)	(±1.8)	(±.8)
Opossum	14.3	33.2	34.2	18.3
Standard Error	(±2.2)	(±6.0)	(±3.0)	(±5.2)
Woodchuck	20.1	18.9	20.8	40.3
Standard Error	(±6.6)	(±3.2)	(±2.9)	(±7.8)
Squirrel	52.9	23.4	14.2	9.6
Standard Error	(±3.8)	(±2.3)	(±2.1)	(±1.8)
Bat	9.1	17.2	26.4	47.3
Standard Error	(±2.1)	(±4.7)	(±2.4)	(±5.8)
Other	4.2	4.7	89.2	1.9
Standard Error	(±.9)	(±1.3)	(±1.5)	(±.7)

B. National population estimates based on data collected from monitored farms (continued)

q. Percent of farms and frequency of times per month someone:

Activity	Number of Times per Month					
	0.0	.1-9	1-1.9	2-2.9	3-4.9	5+
From this farm visited						
another farm or market	14.2	3.0	17.5	17.6	26.8	21.0
Standard Error	(±4.3)	(±1.6)	(±2.4)	(±2.5)	(±2.2)	(±2.4)
From another swine farm or						
market visited the farm	31.0	4.7	25.0	12.1	14.5	12.8
Standard Error	(±3.0)	(±1.7)	(±2.7)	(±1.6)	(±3.9)	(±1.9)
Delivered feed directly to						
on-farm storage	32.8	0.9	18.0	18.5	19.2	10.7
Standard Error	(±4.0)	(±.4)	(±2.6)	(±2.2)	(±2.2)	(±1.8)
Delivered feed to a perimeter						
location	82.8	0.5	5.4	4.5	5.1	1.7
Standard Error	(±1.9)	(±.3)	(±1.2)	(±1.1)	(±1.3)	(±.5)
From this farm picked up feed						
from off-farm source	23.5	1.5	22.1	19.4	23.0	10.4
Standard Error	(±2.4)	(±.7)	(±4.2)	(±2.2)	(±2.8)	(±1.7)
From this farm hired the						
trucking of swine	75.2	1.8	7.0	8.1	7.6	0.4
Standard Error	(±4.4)	(±1.0)	(±1.2)	(±1.9)	(±4.0)	(±.1)

r. Swine removed and returned during the previous 12 months:

#Times Removed & Returned	% Farms	Standard Error
0	86.7	(±2.3)
1	6.0	(±1.5)
2	1.6	(±.7)
3	2.0	(±.7)
4+	<u>3.7</u>	(±1.4)
Total	100.0	
# Swine Moved	% Farms	Standard Error
1	23.6	(±8.2)
2-4	18.5	(±6.0)
5+	<u>57.9</u>	(±7.8)
Total	100.0	

B. National population estimates based on data collected from monitored farms (continued)

s. Percent of farms with the following known animal classes within one mile of farm:

Type of Animal	# Farms Within One Mile						
	0	1	2	3-4	5-9	10+	Unknown
Swine	27.9	23.9	20.1	18.3	7.5	1.2	1.1
Standard Error	(±3.9)	(±2.1)	(±2.5)	(±2.3)	(±1.6)	(±.7)	(±.7)
Cattle	9.9	28.5	17.4	25.3	14.2	3.1	1.6
Standard Error	(±1.5)	(±3.1)	(±2.4)	(±2.4)	(±1.8)	(±1.0)	(±.8)
Poultry	51.8	32.4	4.7	3.8	0.6	0.4	6.3
Standard Error	(±3.3)	(±4.1)	(±1.1)	(±1.1)	(±.3)	(±.2)	(±1.5)
Sheep	60.3	25.2	7.5	1.6	0.1	0.4	4.9
Standard Error	(±2.7)	(±2.2)	(±1.5)	(±.6)	(±.1)	(±.4)	(±1.2)
Goats	78.4	11.9	0.9	1.1	0.1	0.0	7.6
Standard Error	(±2.6)	(±1.8)	(±.4)	(±.7)	(±.1)	(±—)	(±1.5)

t. Percent of farms with the following known animal classes within three miles of farm:

Type of Animal	# Farms Within Three Miles						
	0	1	2	3-4	5-9	10+	Unknown
Swine	13.0	8.3	11.6	17.3	24.3	19.1	6.4
Standard Error	(±4.1)	(±1.5)	(±1.7)	(±2.2)	(±2.9)	(±2.4)	(±1.5)
Cattle	1.8	8.7	8.7	18.3	30.2	25.3	7.0
Standard Error	(±.5)	(±2.5)	(±2.2)	(±3.9)	(±2.5)	(±2.2)	(±1.7)
Poultry	34.5	24.5	10.1	10.0	3.5	2.4	15.0
Standard Error	(±2.7)	(±3.7)	(±1.8)	(±1.7)	(±.9)	(±.9)	(±2.4)
Sheep	30.8	24.7	13.9	12.5	3.2	0.9	14.0
Standard Error	(±3.2)	(±2.8)	(±2.1)	(±4.7)	(±.9)	(±.5)	(±2.7)
Goats	60.7	17.9	2.3	0.9	0.8	0.1	17.3
Standard Error	(±3.5)	(±2.2)	(±.8)	(±.3)	(±.3)	(±.1)	(±2.7)

B. National population estimates based on data collected from monitored farms (continued)

u. Percent of farms by distance in miles from this farm to the nearest known:

	<u>Distance in Miles</u>						
	<u><.25</u>	<u>.25-.49</u>	<u>.50-.99</u>	<u>1.0-2.99</u>	<u>3.0-4.99</u>	<u>5+</u>	<u>Unknown</u>
Farm with swine	7.3	12.9	31.1	31.2	5.6	11.8	0.1
Standard Error	(±1.6)	(±1.9)	(±2.9)	(±2.7)	(±1.3)	(±4.0)	(±.1)
Farm with swine in the direction of the prevailing wind	9.6	5.6	18.8	36.9	13.7	14.6	0.8
Standard Error	(±3.6)	(±1.4)	(±2.3)	(±3.1)	(±2.4)	(±1.8)	(±.6)
Market for swine	0.8	0.6	0.6	3.5	12.1	82.4	0.0
Standard Error	(±.5)	(±.5)	(±.4)	(±1.0)	(±2.3)	(±2.9)	(±—)
Farm with cattle	11.9	19.4	28.9	33.3	2.6	3.0	0.8
Standard Error	(±1.8)	(±2.2)	(±2.4)	(±3.3)	(±.7)	(±1.3)	(±.4)
Farm with poultry	16.2	7.6	16.2	26.6	6.5	13.3	13.5
Standard Error	(±2.5)	(±1.3)	(±2.3)	(±4.4)	(±1.5)	(±1.7)	(±2.8)
Farm with sheep	15.8	4.3	12.1	29.6	16.4	12.4	9.4
Standard Error	(±2.5)	(±.9)	(±1.7)	(±2.4)	(±4.0)	(±2.2)	(±1.4)
Farm with goats	30.1	1.6	5.8	13.3	7.0	14.4	27.8
Standard Error	(±5.1)	(±.7)	(±1.4)	(±1.9)	(±1.3)	(±1.8)	(±3.6)

v. Percent of farms by distance to nearest public road from:

	<u>Distance to Nearest Public Road (in Feet)</u>			
	<u><99</u>	<u>100-299</u>	<u>300-999</u>	<u>1,000+</u>
Closest swine building on this farm	25.1	31.4	28.3	15.2
Standard Error	(±4.6)	(±3.4)	(±2.9)	(±1.7)
Closest point on-farm pig location	39.2	26.2	21.3	13.3
Standard Error	(±4.8)	(±3.1)	(±2.4)	(±1.7)

w. Percent of producers “considering” their herd free of:

<u>Illness or Condition</u>	<u>Percent</u>	<u>Standard Error</u>
Swine dysentery	16.0	(±3.0)
Transmissible gastroenteritis	12.7	(±2.8)
Brucellosis	33.0	(±2.8)
Lice	14.4	(±1.8)
Mange	12.6	(±1.7)
Atrophic rhinitis	10.5	(±1.9)
Pseudorabies	48.8	(±3.7)
Swine influenza	11.2	(±2.9)
<u>Hemophilus pleuropneumonia</u>	9.5	(±1.6)
<u>Hemophilus parasuis</u>	8.7	(±1.9)
Other	1.1	(±.4)

B. National population estimates based on data collected from monitored farms (continued)

x. Percent of producers by method and time frame for disposal of dead animals:

Method	Same	Disposal Time (#Days)			N/A	% Total
		1	2-4	4+		
Burial	29.5	14.7	14.9	3.3	37.6	100.0
Standard Error	(±3.2)	(±1.8)	(±2.1)	(±1.1)	(±3.2)	
Burning	8.5	7.4	4.4	1.3	78.4	100.0
Standard Error	(±1.3)	(±1.4)	(±.9)	(±.7)	(±2.1)	
Renderer entering farm	5.8	10.5	9.6	0.7	73.4	100.0
Standard Error	(±1.2)	(±2.0)	(±1.8)	(±.4)	(±2.5)	
Renderer at perimeter of farm	8.5	12.6	8.3	0.4	70.2	100.0
Standard Error	(±2.6)	(±1.6)	(±1.4)	(±.2)	(±3.3)	
Other	10.4	3.0	2.8	1.4	82.4	100.0
Standard Error	(±2.0)	(±1.0)	(±1.1)	(±.4)	(±2.2)	

y. Percent of farms by numbers of years swine have been continuously raised on the farm:

Years	% Farms	Standard Error
<5	14.7	(±2.3)
5-9	15.1	(±4.5)
10-14	14.4	(±2.1)
15-19	10.1	(±1.8)
20-29	15.5	(±2.0)
30-39	10.8	(±1.3)
40-49	6.3	(±1.0)
50+	13.1	(±2.3)
Total	100.0	

z. Percent of farms with waterways or lake/pond present on the farm and percent of all farms with swine access to waterways or lake/pond

	% Present	Standard Error	% Access by Swine		Standard Error	
Waterway	49.3	(±4.3)	7.0	(±1.5)		
Lake/pond	29.9	(±2.7)	5.6	(±1.7)		
Miles from swine facilities to the nearest waterway or lake/pond on this farm						
	<.10	.10-.24	.25-.49	.50-.99	1+	% Total
Waterway	30.5	11.4	23.1	22.0	13.0	100.0
Standard Error	(±4.1)	(±2.3)	(±4.0)	(±4.7)	(±7.6)	
Lake/pond	47.1	7.8	13.7	28.0	3.4	100.0
Standard Error	(±5.7)	(±2.3)	(±3.0)	(±5.2)	(±1.9)	

B. National population estimates based on data collected from monitored farms (continued)
Miles from swine facilities to the nearest waterway or lake/pond not on the farm

	<u><.10</u>	<u>.10-.24</u>	<u>.25-.49</u>	<u>.50-.99</u>	<u>1+</u>	<u>% Total</u>
Waterway	6.7	2.7	12.2	22.9	55.5	100.0
Standard Error	(±1.8)	(±.6)	(±1.6)	(±2.2)	(±2.9)	
Lake/pond	4.8	1.3	8.4	19.5	66.0	100.0
Standard Error	(±1.1)	(±.5)	(±1.7)	(±2.0)	(±2.9)	

11. Specific health events considered a problem during the previous 12 months:

<u>Health Event</u>	<u>% Farms</u>	<u>Standard Error</u>
Internal parasites	27.0	(±2.6)
Nonparasitic digestive	65.7	(±4.2)
Diarrhea	56.8	(±3.8)
Constipation	19.3	(±3.4)
Rectal prolapse	34.8	(±3.8)
Rectal stricture	15.0	(±2.3)
Other	1.6	(±.7)
Respiratory	56.6	(±3.3)
Pneumonia	48.5	(±3.5)
Rhinitis	30.8	(±3.1)
Other	0.8	(±.3)
Reproductive	54.6	(±4.6)
Small size litters	27.2	(±3.1)
Increased number of stillbirths	11.9	(±2.2)
Increased number of mummies	10.0	(±2.3)
Increased number of abortions	5.6	(±1.0)
Poor conception rate	25.7	(±2.6)
Prolonged weaning to breeding interval	13.4	(±2.0)
Failure to farrow	15.7	(±2.2)
Orchitis (inflamed testicles)	2.4	(±1.1)
Other	3.1	(±.9)
External parasites	45.3	(±4.4)
Other skin diseases	24.9	(±3.4)
Muscles, bones, or joint problems	50.0	(±4.9)
Nervous system	18.8	(±3.2)
Other diseases	10.7	(±2.9)

B. National population estimates based on data collected from monitored farms (continued)

12. Vaccination practices

a. Piglets		Percent	Standard Error
Percentage of farms routinely vaccinating before or at weaning		57.2	(±3.4)
<u>Specific Vaccination Used</u>	<u>% Farms</u>	<u>Standard Error</u>	
Hemophilus pleuropneumonia	13.4	(±1.9)	
Erysipelas	46.5	(±3.1)	
Atrophic rhinitis	42.2	(±3.0)	
Pasteurella pneumonia	28.4	(±2.3)	
Pseudorabies	2.1	(±.6)	
Streptococcus	12.2	(±1.8)	
Autogenous bacterin	3.3	(±1.0)	
Transmissible gastroenteritis	3.8	(±1.1)	
<u>E. coli</u> scours	11.7	(±1.5)	
<u>Clostridium perfringens</u> antitoxin	8.2	(±1.5)	
Other	7.4	(±1.3)	
b. Sows and/or gilts			
Percentage of farms routinely vaccinating		77.5	(±3.5)
<u>Specific Vaccination Used</u>	<u>% Farms</u>	<u>Standard Error</u>	
Transmissible gastroenteritis	24.3	(±2.4)	
<u>E. coli</u> scours	46.9	(±2.7)	
Rotavirus	15.8	(±2.0)	
<u>Clostridium perfringens</u>	22.4	(±2.2)	
Hemophilus pleuropneumonia	7.2	(±1.4)	
Erysipelas	61.4	(±3.3)	
Atrophic rhinitis	38.3	(±2.9)	
Parvovirus	65.0	(±3.6)	
Leptospirosis	70.2	(±3.8)	
Pseudorabies	21.5	(±2.7)	
Other	18.1	(±1.9)	
c. Boars			
Percentage of farms routinely vaccinating		62.6	(±3.4)
<u>Specific Vaccination Practice</u>	<u>% Farms</u>	<u>Standard Error</u>	
<u>Hemophilus parasuis</u>	6.1	(±1.2)	
Erysipelas	48.4	(±2.9)	
Atrophic rhinitis	25.2	(±2.5)	
Parvovirus	49.6	(±3.3)	
Leptospirosis	53.9	(±3.3)	
Pseudorabies	21.3	(±2.9)	
Other	11.4	(±1.5)	

B. National population estimates based on data collected from monitored farms (continued)

13. Preventive practices

		Percent	Standard Error
a. Piglets			
Percentage of farms routinely using any preventive practice		98.4	(±.8)
Specific Preventive Practice	% Farms	Standard Error	
Deworm	48.0	(±2.9)	
Mange/Lice treatment	40.2	(±2.9)	
Clip needle teeth	76.1	(±4.1)	
Dock tails	78.9	(±4.5)	
Iron - oral	15.2	(±2.7)	
Iron - shots	78.6	(±3.7)	
Dip/Spray navels	22.5	(±2.2)	
Castration	90.4	(±2.1)	
Antibiotics - oral	18.8	(±2.3)	
Antibiotics - injection	32.7	(±2.7)	
Coccidiostats	2.1	(±.7)	
Other	5.3	(±1.7)	
b. Sows and/or gilts			
Percentage of farms routinely using any preventive practice		93.9	(±1.1)
Specific Preventive Practice	% Farms	Standard Error	
Deworm	85.4	(±2.0)	
Mange/Lice treatment	72.0	(±4.0)	
Antibiotics in feed	39.1	(±3.0)	
Antibiotics in water	0.8	(±.3)	
Antibiotics - injection	15.9	(±1.9)	
Coccidiostats	2.7	(±.6)	
Other	0.6	(±.2)	
c. Boars			
Percentage of farms routinely using any preventive practice		85.2	(±1.8)
Specific Preventive Practice	% Farms	Standard Error	
Deworm	76.3	(±2.6)	
Mange/Lice treatment	69.5	(±4.1)	
Antibiotics in feed	10.9	(±2.2)	
Antibiotics in water	0.0	(±.-)	
Antibiotics - injection	1.5	(±.7)	
Coccidiostats	0.2	(±.1)	
Other	0.2	(±.2)	

B. National population estimates based on data collected from monitored farms (continued)

		<u>Percent</u>		<u>Standard</u>
				<u>Error</u>
14.	Use of consultants			
a.	Percentage of producers using any services of a veterinarian	75.4		(±4.0)
	Percentage of producers using any services of a nonveterinarian	63.6		(±3.7)
		<u>Standard</u>		<u>Standard</u>
<u>Type of Service Provided</u>		<u>Veterinarian</u>	<u>Nonveterinarian</u>	<u>Error</u>
	Individual pig treatment/Surgery	45.4	9.3	(±3.7) (±1.9)
	Diagnostic services	67.2	4.4	(±3.7) (±1.0)
	Providing nutrient premixes	4.1	44.0	(±1.3) (±3.9)
	Nutritional consultation	10.2	51.1	(±1.7) (±3.3)
	Housing/Ventilation consultation	10.9	26.7	(±2.1) (±2.9)
	Other management consultation	13.5	21.6	(±2.0) (±2.8)
	Providing drugs	60.9	24.9	(±4.3) (±2.3)
	Vaccination consultation	56.8	7.2	(±4.1) (±1.2)
	Slaughter checks	14.2	3.1	(±1.7) (±1.0)
	Artificial insemination	0.0	5.1	(±—) (±1.3)
	Semen collection	0.1	1.4	(±.1) (±.5)
	Other	1.2	0.4	(±.6) (±.3)
15.	Facility characteristics			
a.	Percent of farms with one or more of the following types of farrowing facilities:			
	Total confinement	81.1		(±3.8)
	Open building with:			
	No outside access	4.4		(±1.2)
	Access to dirt/concrete	16.2		(±3.2)
	Access to pasture	0.8		(±.6)
	Hut or no building:			
	Lot	3.9		(±1.0)
	Pasture	2.1		(±1.0)
b.	Percent of farms with farrowing crates	<u>% Farms with</u>		<u>Standard</u>
		<u>Total Confinement</u>		<u>Error</u>
		85.9		(±4.0)
	Percent of total farms with the following crate types:			
	All metal	77.6		(±3.7)
	Wood	1.8		(±.6)
	Wood and metal	7.1		(±1.5)
	Other	1.3		(±.5)
	Percent of total farms with special guardrails or bars in addition to those normally present in the crate structure	26.5		(±2.4)

B. National population estimates based on data collected from monitored farms (continued)		
c. Type of Flooring or Footing Swine Are Exposed To	% Farms with	Standard
	<u>Total Confinement</u>	<u>Error</u>
Concrete	29.6	(±5.8)
Slats-concrete	4.1	(±1.2)
Wire or metal	57.6	(±3.6)
Coated metal	23.3	(±3.7)
Dirt	—	(±.-)
Pasture	—	(±.-)
Wood	10.4	(±1.8)
Other	10.0	(±1.8)
d. Type of Ventilation	% Farms with	Standard
	<u>Total Confinement</u>	<u>Error</u>
Natural	30.3	(±5.1)
Pit fans	15.5	(±2.5)
Wall/Ceiling fans	75.7	(±3.7)
e. Type of Water Sources the Sows Drink From	% Farms with	Standard
	<u>Total Confinement</u>	<u>Error</u>
Cup	54.9	(±5.1)
Nipple	38.5	(±3.1)
Trough-one sow	15.7	(±4.9)
Trough-many sows	1.7	(±.6)
Creek/pond	—	(±.-)
Other	1.3	(±.5)
f. Type of Waste Management	% Farms with	Standard
	<u>Total Confinement</u>	<u>Error</u>
None	0.1	(±.1)
Pit-recharge	2.1	(±.9)
Pit-holding	29.2	(±2.5)
Mechanical scraper/tractor	12.1	(±3.3)
Hand cleaned	41.6	(±4.9)
Flush-under slats/fresh water	13.4	(±2.0)
Flush-under slats/recycled water	3.1	(±1.0)
Flush-open gutter/fresh water	6.8	(±1.4)
Flush-open gutter/recycled water	0.2	(±.2)
Other	5.8	(±1.4)

B. National population estimates based on data collected from monitored farms (continued)

g. Type of Cleaning Method		% Farms with	Standard
		<u>Total Confinement</u>	<u>Error</u>
None		12.2	(±4.7)
Washed with water		24.9	(±3.3)
Pressure cleaned		65.9	(±4.0)
Disinfected		53.2	(±3.5)
Fumigated		2.8	(±.8)
Other		2.5	(±.6)
h. Percent of farms with farrowing facilities idle between			
one farrowing and the next		60.0	(±5.1)
		% Farms with	Standard
		<u>Total Confinement</u>	<u>Error</u>
<u>Amount of Time Idle</u>			
1-2 days		13.2	(±2.2)
3-5 days		14.7	(±2.0)
One week		16.1	(±2.8)
Two weeks		10.3	(±2.7)
One month or more		7.1	(±1.7)
i. Percent of farms cleaning facilities after every			
group farrowed		75.1	(±2.9)
j. Percent of farms with supplemental heat in at			
least one facility		92.2	(±2.6)
		% Farms with	Standard
		<u>Total Confinement</u>	<u>Error</u>
<u>Type of Heat Used</u>			
Room heating		65.8	(±4.4)
Heat lamp		66.7	(±3.6)
Radiant heater		10.9	(±1.5)
Heated floor		3.4	(±1.3)
Heat pad		22.9	(±3.2)
Other		3.1	(±1.2)
k. Percent of farms with supplemental cooling			
in at least one facility		46.5	(±3.9)
		% Farms with	Standard
		<u>Total Confinement</u>	<u>Error</u>
<u>Type of Cooling Used</u>			
Directed forced-air fans (other than for ventilation)		19.4	(±2.8)
Shade		—	(±-.)
Evaporative room coolers(swamp coolers)		2.3	(±.9)
Mist or spray coolers for group		2.5	(±1.0)
Drip coolers for individuals		27.1	(±3.4)
Head cooling		1.1	(±.7)
Other		1.0	(±.4)

B. National population estimates based on data collected from monitored farms (continued)

1. Percent of farms using bedding in at least one swine facility:	% Farms with <u>Total Confinement</u>	Standard Error
	24.2	(±5.4)
Type of Bedding Used	% Farms with <u>Total Confinement</u>	Standard Error
Wood shavings/sawdust	5.4	(±1.2)
Roughage (straw, corn stalks, hay)	19.1	(±5.0)
Other	2.0	(±1.2)
16. Percent of sow herd replaced annually	<u>Percent</u>	Standard Error
Farm average reported	30.6	(±1.7)
Sow average	25.8	(±2.3)
17. Average times during the three-month monitoring period animals were:	<u># Times</u>	Standard Error
a. Transported to or from the farm on trucks owned by the farm	7.1	(±.5)
b. Transported to or from the farm on trucks owned by the source or destination	1.0	(±.1)
c. Transported to or from the farm by independent trucker	1.1	(±.2)
d. Transported directly to or from isolation or permanent housing at the farm	2.1	(±.5)
e. Transferred to or from on-farm vehicles at the perimeter of the farm	1.0	(±.2)
f. Other	0.2	(±.1)

B. National population estimates based on data collected from monitored farms (continued)

18. Description of swine purchased in the previous three months from various sources

a. Percent of farms by pig type

Pig Type	Sources					Any Source
	Sale Barn	Breeding Company	Specific Pathogen-free Producer	Nonspecific Pathogen-free Producer	Test Station	
Bred and gestation	0.0	0.0	0.5	0.5	0.0	1.0
Standard Error	(±—)	(±—)	(±.3)	(±.4)	(±—)	(±.5)
Open sows for breeding	0.0	0.0	0.0	0.3	0.0	0.3
Standard Error	(±—)	(±—)	(±—)	(±.2)	(±—)	(±.2)
Replacements gilts bred	0.0	0.7	0.3	2.9	0.0	3.8
Standard Error	(±—)	(±.3)	(±.2)	(±.9)	(±—)	(±1.0)
Replacements gilts not bred	0.0	2.7	4.1	11.1	0.3	18.1
Standard Error	(±—)	(±.8)	(±.9)	(±2.1)	(±.2)	(±2.3)
Sows nursing piglets	0.0	0.0	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Boars for breeding	0.0	6.1	8.9	12.6	1.0	28.4
Standard Error	(±—)	(±1.1)	(±1.9)	(±2.2)	(±.4)	(±3.0)
Sows no longer used for breeding	0.0	0.0	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Boars no longer used for breeding	0.0	0.0	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)	(±—)	(±—)
Weaned pigs up to 40 pounds	0.9	0.1	0.4	0.3	0.0	1.6
Standard Error	(±.7)	(±.1)	(±.3)	(±.3)	(±—)	(±.8)
Pigs 40 to 59 pounds	0.3	0.1	0.0	1.5	0.0	2.0
Standard Error	(±.3)	(±.1)	(±—)	(±1.1)	(±—)	(±1.2)
Pigs 60 to 119 pounds	0.0	0.0	0.0	0.4	0.0	0.4
Standard Error	(±—)	(±—)	(±—)	(±.2)	(±—)	(±.2)
Pigs 120 to 179 pounds	0.0	0.0	0.0	0.1	0.0	0.1
Standard Error	(±—)	(±—)	(±—)	(±.1)	(±—)	(±.1)
Pigs 180+ pounds	0.0	0.1	0.1	0.1	0.1	0.1
Standard Error	(±)	(±.1)	(±.04)	(±.04)	(±.04)	(±.1)
% Total Farms	1.2	7.5	12.5	22.3	1.3	41.3
Standard Error	(±.8)	(±1.2)	(±2.0)	(±2.5)	(±.5)	(±2.9)

B. National population estimates based on data collected from monitored farms (continued)

19. Location of swine purchases in the previous three months from any source

a. Percent of farms by pig type

Pig Type	In State		Out of State	Out of Country
	<25 Miles	>25 Miles		
Bred and gestation	0.7	0.3	0.1	0.0
Standard Error	(±.4)	(±.3)	(±.1)	(±—)
Open sows for breeding	0.1	0.1	0.0	0.0
Standard Error	(±.1)	(±.1)	(±—)	(±—)
Replacement gilts bred	0.5	2.7	0.6	0.0
Standard Error	(±.2)	(±.8)	(±.4)	(±—)
Replacement gilts not bred	7.1	6.4	4.7	0.0
Standard Error	(±1.7)	(±1.3)	(±1.1)	(±—)
Sows nursing piglets	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)
Boars for breeding	9.5	10.7	8.6	0.5
Standard Error	(±2.0)	(±1.7)	(±1.6)	(±.4)
Sows no longer used for breeding	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)
Boars no longer used for breeding	0.0	0.0	0.0	0.0
Standard Error	(±—)	(±—)	(±—)	(±—)
Weaned pigs up to 40 pounds	1.1	0.5	0.1	0.0
Standard Error	(±.8)	(±.3)	(±.1)	(±—)
Pigs 40 to 59 pounds	1.8	0.2	0.0	0.0
Standard Error	(±1.2)	(±.1)	(±—)	(±—)
Pigs 60 to 119 pounds	0.3	0.2	0.1	0.0
Standard Error	(±.2)	(±.2)	(±.04)	(±—)
Pigs 120 to 179 pounds	0.0	0.1	0.0	0.0
Standard Error	(±—)	(±.1)	(±—)	(±—)
Pigs 180+ pounds	0.0	0.1	0.1	0.0
Standard Error	(±)	(±.04)	(±.1)	(±)
% Total Farms	16.9	17.7	10.9	0.5
Standard Error	(±2.3)	(±2.0)	(±1.8)	(±.4)

Descriptive Findings - Monitored and Nonmonitored Farms

II - General characteristics of all farms completing the General Swine Farm Report

A. Sample profile

1. Descriptive characteristics of farms

a. Number of farms by size of female breeding herd:

0	7
1-49	495
50-99	406
100-499	636
500+	<u>117</u>
Total	1,661

b. Number of farms by type of operation:

Farrow-to-finish	1,304
Grower/finisher	11
Feeder pig producer	311
Breeding stock producer	<u>35</u>
Total	1,661

c. Number of farms by type of farrowing management:

All-in, all-out	854
Continuous farrowing	804
Unknown	<u>3</u>
Total	1,661

B. Selected characteristics (estimates of the National population)

1. Operation management

a. Percent of farms by management:	<u>Percent</u>	Standard Error
Individual operator	84.4	(±1.4)
Hired manager	1.5	(±.3)
Partners	<u>14.1</u>	(±1.5)
Total	100.0	

b. Percent of farms by business and marketing arrangement:	<u>Percent</u>	Standard Error
Independent producer-marketing directly	93.8	(±1.2)
Independent producer-marketing through a cooperative	5.5	(±1.1)
Contract producer	<u>.7</u>	(±.3)
Total	100.0	

B. Selected characteristics (estimates of the National population - continued)		
c. Percent of farms by predominant type of operation:		
	<u>Percent</u>	Standard Error
Farrow-to-finish	69.4	(±1.8)
Grower/finisher	0.5	(±.2)
Producer of feeder pigs	28.6	(±1.9)
Producer of breeding stock	<u>1.5</u>	(±.5)
Total	100.0	
d. Percent of farms using the following record keeping systems:		
Pocket diary or calendar	64.3	(±3.2)
Record cards for members of breeding herd	28.0	(±3.3)
Micro-computer	8.0	(±.6)
Bureau-based computer	7.6	(±1.0)
Other	29.3	(±1.7)
2. Inventory under contract:		
Percent of inventory	5.4	(±2.3)
Farm average percent	1.4	(±.4)
3. Description of hogs sold		
a. Percent sold by farm:		
Slaughter market hogs	63.2	(±1.6)
Feeder pigs	31.6	(±1.7)
Replacement stock	0.8	(±.2)
Culled breeding stock	4.0	(±.4)
Other	<u>0.4</u>	(±.1)
Total	100.0	
b. Percent sold by type of hog:		
Slaughter market hogs	68.9	(±3.3)
Feeder pigs	25.9	(±3.1)
Replacement stock	1.3	(±.3)
Culled breeding stock	3.7	(±.1)
Other	<u>0.2</u>	(±.1)
Total	100.0	
C. Farrowing management (estimates of the National population)		
1. Facility management:		
a. Percent of farms practicing:		
All-in, all-out	48.2	(±2.5)
Continuous farrowing	<u>51.8</u>	(±2.5)
Total	100.0	
b. Percent of females managed:		
All-in, all-out	55.1	(±2.9)

C. Farrowing management (estimates of the National population - continued)

2. Sow management

a. Percent of producers who:	<u>Percent</u>	Standard Error
Washed sows before farrowing	19.4	(±1.7)
Observed sows during farrowing	59.7	(±2.2)
Induced sows to farrow by injection	2.0	(±.3)
Manually assisted sows during farrowing	6.3	(±.6)
Gave oxytocin to sows during farrowing	20.6	(±1.2)
Retained sows at weaning for nursing other pigs	1.5	(±.3)

b. Percent of sows:		
Washed before farrowing	31.2	(±4.3)
Observed during farrowing	55.0	(±1.3)
Induced to farrowing by injection	4.3	(±.6)
Manually assisted during farrowing	6.7	(±.4)
Given oxytocin during farrowing	24.3	(±1.2)
At weaning retained for nursing other pigs	1.6	(±.1)

3. Piglet feeding

a. Percent of farms feeding:		
Supplemental milk	4.5	(±.8)
Creep prestarter	79.3	(±2.5)

b. Percent of piglets fed:		
Supplemental milk	4.9	(±.7)
Creep prestarter	81.3	(±2.2)

4. Piglet weaning

a. Average age of pigs at weaning:	<u>Days</u>	Standard Error
Farm average	34.7	(±.4)
Pig average	28.8	(±.3)

b. Average weight of pigs at weaning:	<u>Pounds</u>	Standard Error
Farm average	23.7	(±.3)
Pig average	18.5	(±.4)

5. Breed of sires and dams for litters expected to farrow in the next three months:

a. Percent of farms with:		Standard Error		Standard Error
<u>Breed</u>	<u>Boars</u>		<u>Sows and Gilts</u>	
White purebreds	26.0	(±1.9)	12.3	(±1.7)
Colored purebreds	30.1	(±1.7)	4.2	(±.7)
Defined crossbreds or hybrids	36.6	(±2.8)	55.1	(±2.6)
Undefined genetic mixbreds	<u>7.3</u>	(±1.7)	<u>28.4</u>	(±1.8)
Total	100.0		100.0	

C. Farrowing management (estimates of the National population - continued)

b. Percent of animals:

<u>Breed</u>	<u>Boars</u>	<u>Standard</u>	<u>Sows and Gilts</u>	<u>Standard</u>
		<u>Error</u>		<u>Error</u>
White purebreds	21.7	(±1.5)	9.1	(±1.4)
Colored purebreds	29.3	(±1.4)	4.3	(±.9)
Defined crossbreds or hybrids	44.1	(±2.7)	64.1	(±2.4)
Undefined genetic mixbreds	<u>4.9</u>	(±1.1)	<u>22.5</u>	(±1.4)
Total	100.0		100.0	

6. Productivity three months prior to monitoring (retrospective data)

a. Average number of sows and gilts farrowed per farm

<u># Females</u>	<u>Standard Error</u>
34.1	(±1.4)

b. Per-litter productivity

	<u># Piglets/ Litter</u>	<u>Standard Error</u>
Born	10.3	(±.04)
Born alive per litter	9.5	(±.04)
Died per litter	1.1	(±.04)
Percent preweaning mortality	11.6	(±.4)
Weaned per litter	8.4	(±.05)

c. Percent of preweaning piglet deaths due to the attributed first and second leading cause of death:

	<u>Percent</u>	<u>Standard Error</u>
Scours	23.9	(±1.5)
Nervous problem	0.3	(±.1)
Lameness	1.1	(±.5)
Deformity	0.2	(±.1)
Laid on	40.4	(±1.8)
Starvation	20.4	(±1.1)
Trauma	1.6	(±.4)
Respiratory problem	1.8	(±.3)
Other known problem	4.0	(±.7)
Unknown problem	<u>6.3</u>	(±1.5)
Total	100.0	

C. Farrowing management (estimates of the National population - continued)

d. Percent of farms by attributed first and second leading causes of preweaning piglet death:

	<u>First</u>		<u>Second</u>	
	<u>Percent</u>	<u>Standard Error</u>	<u>Percent</u>	<u>Standard Error</u>
Scours	21.0	(±1.4)	23.2	(±1.7)
Nervous problem	0.3	(±.2)	1.2	(±.4)
Lameness	0.5	(±.4)	2.1	(±.5)
Deformity	0.2	(±.1)	1.3	(±.4)
Laid on	48.2	(±3.3)	29.9	(±1.7)
Starvation	14.5	(±1.2)	23.9	(±1.4)
Trauma	4.9	(±1.2)	3.4	(±1.5)
Respiratory problem	1.3	(±.3)	2.4	(±.4)
Other known problem	4.1	(±1.2)	3.9	(±.6)
Unknown problem	<u>5.0</u>	(±1.4)	<u>8.7</u>	(±.9)
Total	100.0		100.0	

D. Nursery management (estimates of the National population)

1. Percent managed as all-in, all-out	<u>Percent</u>	<u>Standard Error</u>
a. Farms	47.8	(±3.5)
b. Pigs	53.5	(±3.3)
2. Piglets leaving nursery:		
a. Age:	<u>Days</u>	<u>Standard Error</u>
Farm average	64.1	(±.6)
Pig average	62.0	(±.5)
b. Weight:	<u>Pounds</u>	<u>Standard Error</u>
Farm average	50.0	(±.5)
Pig average	48.0	(±.5)
3. Deaths (during the nursery phase three months prior to monitoring)		
a. Percent died:	<u>Percent</u>	<u>Standard Error</u>
Farm average	2.3	(±.1)
Pig average	2.4	(±.1)

D. Nursery management (estimates of the National population - continued)

b. Percent of deaths due to the attributed first and second leading causes:

	<u>Percent</u>	<u>Standard Error</u>
Scours	25.1	(±2.7)
Nervous problem	1.9	(±.7)
Lameness	3.0	(±.7)
Deformity	0.5	(±.2)
Laid on	0.5	(±.1)
Starvation	8.7	(±1.2)
Trauma	4.0	(±.8)
Respiratory problem	23.9	(±2.5)
Other known problem	14.5	(±3.4)
Unknown problem	<u>17.9</u>	(±1.7)
Total	100.0	

c. Percent of farms by the attributed first and second leading causes of death:

	<u>First</u>		<u>Second</u>	
	<u>Percent</u>	<u>Standard Error</u>	<u>Percent</u>	<u>Standard Error</u>
Scours	25.6	(±1.5)	14.2	(±1.4)
Nervous problem	1.6	(±.6)	1.6	(±.4)
Lameness	2.9	(±.7)	6.9	(±1.4)
Deformity	1.2	(±.6)	2.4	(±.7)
Laid on	0.9	(±.3)	2.0	(±.7)
Starvation	6.8	(±.8)	8.0	(±1.0)
Trauma	6.7	(±.9)	10.7	(±1.4)
Respiratory problem	20.0	(±2.4)	22.7	(±2.0)
Other known problem	11.0	(±2.9)	6.7	(±1.1)
Unknown problem	<u>23.3</u>	(±1.9)	<u>24.8</u>	(±2.1)
Total	100.0		100.0	

E. Grower/finisher management (estimates of the National population)

1. Percent managed as all-in, all-out	<u>Percent</u>	<u>Standard Error</u>
a. Farms	30.0	(±1.9)
b. Pigs	23.9	(±1.6)
2. Pigs leaving grower/finisher unit		
a. Age:	<u>Days</u>	<u>Standard Error</u>
Farm average	183.2	(±3.9)
Pig average	180.0	(±.5)
b. Weight:	<u>Pounds</u>	<u>Standard Error</u>
Farm average	240.6	(±5.2)
Pig average	236.1	(±.3)

^a(Inventory for the number of females that were gestating, lactating, and weaned <2 weeks, but not yet bred; divided by the inventory for the total female population of reproductive age) x 100.

E. Grower/finisher management (estimates of the National population - continued)

3. Deaths (during the finishing phase three months prior to monitoring)

a. Percent died:	<u>Percent</u>	Standard Error
Farm average	1.5	(±.1)
Pig average	1.8	(±.1)

b. Percent of deaths due to the attributed first and second leading causes:

	<u>Percent</u>	Standard Error
Scours	1.9	(±.4)
Nervous problem	0.7	(±.3)
Lameness	7.9	(±.8)
Deformity	0.7	(±.2)
Laid on	0.4	(±.1)
Starvation	0.2	(±.1)
Trauma	8.6	(±1.3)
Respiratory problem	47.9	(±2.6)
Other known problem	12.9	(±1.9)
Unknown problem	<u>18.8</u>	(±1.9)
Total	100.0	

c. Percent of farms by the attributed first and second leading causes of death:

	<u>First</u>		<u>Second</u>	
	<u>Percent</u>	Standard Error	<u>Percent</u>	Standard Error
Scours	2.3	(±.4)	2.9	(±.7)
Nervous problem	1.1	(±.6)	2.5	(±.8)
Lameness	7.4	(±.9)	16.5	(±1.5)
Deformity	1.4	(±.4)	2.8	(±.6)
Laid on	1.7	(±.6)	.5	(±.2)
Starvation	0.2	(±.2)	.5	(±.3)
Trauma	12.1	(±1.2)	12.3	(±1.2)
Respiratory problem	40.8	(±2.5)	19.8	(±1.6)
Other known problem	9.4	(±1.6)	5.2	(±.9)
Unknown problem	<u>23.6</u>	(±2.1)	<u>37.0</u>	(±2.1)
Total	100.0		100.0	

F. Breeding/replacements (estimates of the National population)

1. Sow and gilt mating percentage

a. Farm average percent of sows and gilts	<u>% Females</u>	Standard Error
Hand-mated	19.7	(±2.0)
Pen-mated	<u>80.3</u>	(±2.0)
Total	100.0	

F. Breeding/replacements (estimates of the National population - continued)

b. Percent of sows and gilts	% Females	Standard Error
Hand-mated	32.9	(±2.6)
Pen-mated	<u>67.1</u>	(±2.6)
Total	100.0	

2. Of the sows and gilts hand-mated:

a. Percentage bred:	<u>Farm Average</u>	Standard Error	<u>Sows/Gilts</u>	Standard Error
Naturally	97.3	(±.5)	96.8	(±.7)
By artificial insemination	<u>2.7</u>	(±.5)	<u>3.2</u>	(±.7)
Total	100.0		100.0	
b. Average times females mated per heat period	<u>Average # Times</u>	Standard Error		
	2.3	(±.1)		
c. Average number of different males used per female per heat period	<u>Average # Males</u>	Standard Error		
	1.6	(±.05)		

3. Of the sows and gilts pen-mated:

a. Average females per group	<u># Animals</u>	Standard Error
	15.4	(±.5)
b. Average males per group		(±.1)
	2.2	
c. Frequency of boar rotation between pens:	<u>Percent</u>	Standard Error
Every 12 hours	5.0	(±.9)
Every 24 hours	9.8	(±1.2)
Not rotated	<u>85.2</u>	(±1.7)
Total	100.0	

4. Percent of producers identifying the first and second most common reasons for culling sows as:

	<u>First</u>	Standard Error	<u>Second</u>	Standard Error
Age	34.9	(±3.2)	14.4	(±1.2)
Lameness	9.8	(±1.3)	13.3	(±1.1)
Failure to breed	15.9	(±1.4)	26.7	(±1.9)
Performance	22.2	(±2.4)	23.9	(±1.7)
Size	11.1	(±1.0)	13.3	(±1.6)
Disposition	1.4	(±.5)	5.1	(±.7)
Disease	1.0	(±.3)	1.0	(±.2)
Other	<u>3.7</u>	(±.9)	<u>2.3</u>	(±.4)
Total	100.0		100.0	

F. Breeding/replacements (estimates of the National population - continued)

5. Percent of producers identifying the most common reasons for culling boars as:

	<u>First</u>		<u>Second</u>	
	<u>Percent</u>	<u>Standard Error</u>	<u>Percent</u>	<u>Standard Error</u>
Age	44.3	(±2.1)	17.9	(±1.6)
Lameness	7.0	(±.8)	16.8	(±1.9)
Failure to breed	7.1	(±.9)	13.3	(±1.4)
Performance	8.4	(±1.0)	19.1	(±1.9)
Size	22.8	(±2.3)	24.5	(±2.6)
Disposition	2.2	(±1.1)	3.5	(±.8)
Disease	0.2	(±.1)	.6	(±.2)
Other	<u>8.0</u>	(±1.6)	<u>4.3</u>	(±1.0)
Total	100.0		100.0	

6. Average age at culling

	<u>Years</u>	<u>Standard Error</u>
Sows	2.9	(±.05)
Boars	2.6	(±.03)

7. Average days from last weaning until cull sows leave the operation

<u>Days</u>	<u>Standard Error</u>
3.6	(±.1)

8. Average age:

Replacement gilts are separated from grower/finisher hogs	156.8	(±4.3)
Of gilts at first breeding	227.1	(±2.9)

9. Percent of farms allowing contact of gilts before breeding with:

	<u>% Farms</u>	<u>Standard Error</u>
Boars	52.6	(±3.3)
Sows	36.9	(±2.7)

10. Percent of sow population considered active:

<u>% Sows^a</u>	<u>Standard Error</u>
84.4	(±.1)

11. For gilts allowed contact prior to breeding, the average days exposed:

	<u>Days</u>	<u>Standard Error</u>
Boars	24.7	(±1.3)
Sows	22.2	(±1.2)

F. Breeding/replacements (estimates of the National population - continued)		
12. Boar evaluation for breeding soundness (semen tested)	<u>% Farms</u>	Standard Error
a. Percent of farms evaluating boars	13.4	(±2.1)
b. For farms evaluating boars, farm average percent of boars evaluated:		
	<u>% Boars</u>	Standard Error
Newly added boars	87.3	(±2.5)
Current breeding boars	30.7	(±4.0)
Boars 5 years or older	3.9	(±1.2)
c. For farms evaluating boars, frequency of practice:	<u>% Farms</u>	Standard Error
Prior to or on arrival only	72.0	(±3.7)
Quarterly	10.0	(±2.0)
Semi-annually	1.8	(±.8)
Annually	4.8	(±2.0)
When problems develop	11.4	(±2.3)
Total	100.0	
G. Producers' knowledge about NAHMS:		
1. Percent of producers having heard of NAHMS prior to study	<u>% Producers</u>	Standard Error
	15.4	(±1.4)
2. Percent of those producers who had heard about NAHMS from:		
a. Producer publication or magazine	56.1	(±5.0)
b. Producer group newsletter	20.4	(±6.8)
c. Newspaper	3.2	(±1.0)
d. Extension service	19.6	(±6.7)
e. Local veterinarian	6.9	(±1.9)
f. Producer group meeting	4.8	(±1.0)
g. Neighbor	3.1	(±1.3)
h. Feed or animal health product supplier	8.0	(±4.8)
i. Other	13.1	(±2.4)

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