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Swine 2012

Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012



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Items of Note

Demographics and physical characteristics of smaller operations

Small-enterprise swine operations (fewer than 100 pigs) represent a volatile sector of the swine industry. In these smaller operations entire inventories may be sold from one day to the next. This report takes an in-depth look at these operations, which, for the purposes of this report, were divided into two categories: those with 1 to 49 pigs and those with 50 to 99 pigs.

Operations with 50 to 99 pigs accounted for a much higher percentage of small-enterprise operations than those with 1 to 49 pigs (88.4 and 11.6 percent, respectively) [table A.1.a]. In addition, a higher percentage of operations with 50 to 99 pigs than operations with 1 to 49 pigs had every class of pig (breeding animals, preweaned pigs, and market pigs) on June 1, 2012 (table A.2.a).

Less than 10 percent of operations that housed breeding animals and weaned pigs together did so in total confinement. When sows and weaned pigs were housed separately, nearly 80 percent of operations allowed sows and gilts outside access (table D.2.a). Most operations used group housing for sows and gilts (table D.4.a).

Pig crop

Most operations with sows (71.4 percent) had at least one farrowing event from June 1, 2011, to May 31, 2012 (table B.1.a). Oddly, operations with 50 to 99 pigs had an average of 2.3 more piglets born per litter than operations with 1 to 49 pigs (9.3 and 7.0 piglets, respectively) [table B.2]. This production difference is unusual, given the relatively small difference in size between the operations.

Health and death loss

Despite porcine reproductive and respiratory syndrome (PRRS) being widely dispersed throughout the swine industry, no operations with 50 to 99 pigs reported a known or suspected problem with the disease in sows, gilts, or weaned pigs from June 1, 2011, to May 31, 2012. Nearly 10 percent of operations with 50 to 99 pigs did report difficulties with *Mycoplasma pneumonia* in their weaned pigs (table B.4.b). Perhaps there is some confusion between the two diseases, since about 50 percent of all operations reported no familiarity with PRRS (table B.5.a).

Overall, about 3 percent of weaned pigs died from June 1, 2011, to May 31, 2012 (table B.3.a). This low death rate may be one reason that most producers with fewer than 100 pigs had no visits from local or government veterinarians (table C.3.c). Nearly 40 percent of operations gave weaned pigs antibiotics via feed (table C.4.c).

Rodent control and feral pigs

Cats were used as a rodent control method on nearly 70 percent of operations (table D.5.a). Less than 10 percent of operations reported seeing feral swine on their operation in the past year, and, of these, about 16 percent indicated that feral swine might have entered or gained access to facilities used to house pigs or store feed (tables E.1.b and E.1.d).

Movement

Over half of operations brought pigs on-site from June 1, 2011, to May 31, 2012 (table F.1.a). Feeder pigs represented nearly 70 percent of all pigs brought onto operations (table F.1.e). About two-thirds of pigs came from other producers, and about 20 percent came from auctions/markets. Nearly one-third of producers got pigs from other producers in their counties (table F.2.a).

Over three-fourths of operations permanently moved pigs off the operation (table F.3.a). Market-weight slaughter pigs represented nearly 50 percent of all pigs permanently moved (table F.3.e), and over 50 percent of these pigs were moved directly to slaughter (table F.4.c). Less than 20 percent of operations removed pigs off the operation and then returned them (table F.5.a).

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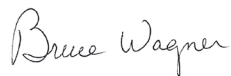
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- The American Association of Swine Veterinarians
- National Pork Board
- National Pork Producers Council

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Feedback:

Feedback, comments, and suggestions regarding the Swine 2012 study reports are welcomed. You may submit feedback via online survey at: <http://www.aphis.usda.gov/nahms>. (Click on "Provide FEEDBACK on NAHMS reports.")

Introduction

In 1983, promoters of the concept that would become the USDA's National Animal Health Monitoring System (NAHMS) envisioned a program that would monitor changes and trends in national animal health and management, thereby providing periodic snapshots of the U.S. food-animal industries. With these industry overviews, stakeholders could identify opportunities for improvement, provide changing foundations for research and special studies, and detect emerging problems.

The 1990 National Swine Survey was NAHMS first national study of the swine industry and provided a snapshot of animal health and management that would serve as a baseline from which to measure industry changes in animal health and management. NAHMS conducted the 1990 National Swine Survey in 18 States, with a target population of operations with at least 1 sow. The sample represented 95 percent of the U.S. swine population. National estimates generated from this study are available in the NAHMS report "Morbidity/Mortality and Health Management of Swine in the United States" (November 1991).

Swine '95 was NAHMS second national swine study and was conducted in the top 16 pork-producing States representing 91 percent of the U.S. swine population. The target population for the first phase of Swine '95 was producers with at least one pig. National estimates generated from this study are available in the NAHMS report "Part I: Reference of 1995 Swine Management Practices" (October 1995). The second phase of Swine '95 was conducted on sites with at least 300 market pigs. National estimates generated from this study are reported in "Part II: Reference of 1995 Grower/Finisher Health and Management" (May 1996).

Swine 2000 was NAHMS third national swine study and provided participants and the industry with information on the U.S. swine herd on operations with 100 or more pigs. The National Agricultural Statistics Service (NASS) collaborated with USDA's Veterinary Services to select a producer sample statistically designed to provide inferences to the Nation's swine population on operations with 100 or more pigs. A total of 17 major pork-producing States participated in the study. These States accounted for 94 percent of the U.S. pig inventory and 92 percent of U.S. pork producers with 100 or more pigs. Results from this study are available in "Part I: Reference of Swine Health and Management, 2000" (September 2001); "Part II: Reference of Swine Health and Management, 2000" (May 2002); "Part III: Reference of Swine Health and Environmental Management, 2000" (September 2002); and "Part IV: Changes in the U.S. Pork Industry, 1990–2000" (November 2008).

Swine 2006, NAHMS fourth national swine study, used the same study design as Swine 2000. Seventeen States also participated in the Swine 2006 study. These States accounted for 94 percent of swine operations and inventory on operations with 100 or more pigs. Results from this study are available in “Part I: Reference of Swine Health and Management, 2006” (October 2007); “Part II: Reference of Swine Health and Management, 2006” (December 2007); “Part III: Reference of Swine Health, Productivity, and General Management in the United States, 2006” (March 2008); and “Part IV: Changes in the U.S. Pork Industry, 1990–2006” (November 2008).

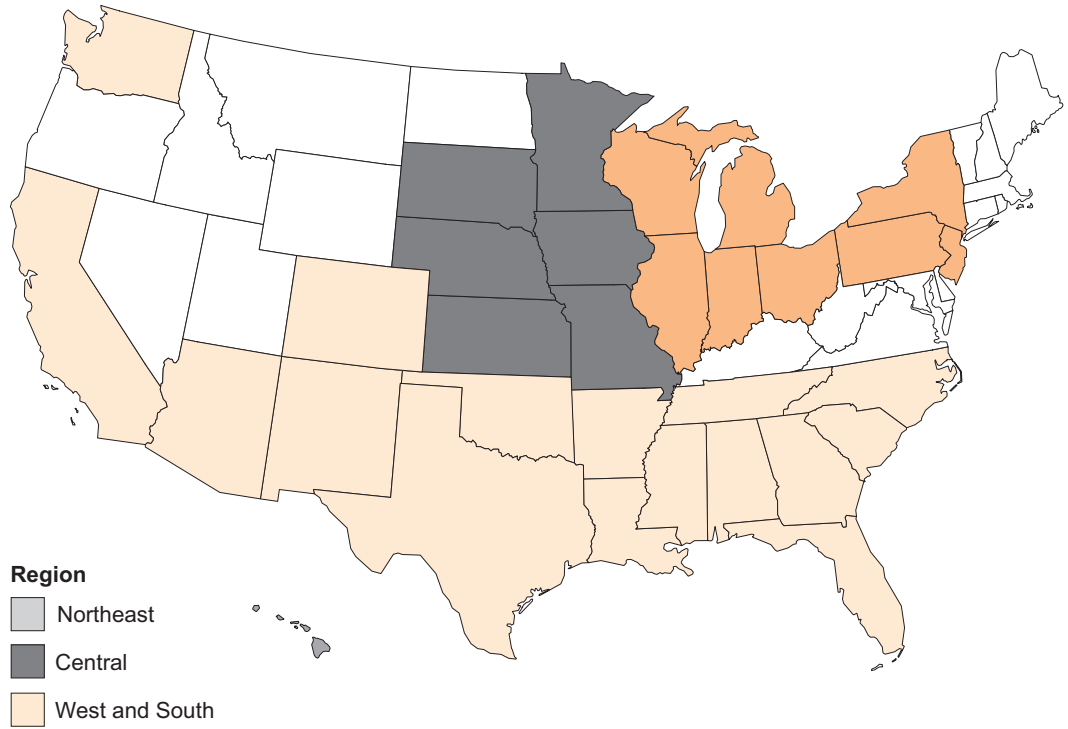
The Small-enterprise Swine 2007 study described the health and management practices of operations with fewer than 100 pigs. The study covered States that participated in NAHMS’ previous national swine studies and States considered at risk for exposure to feral swine and transmission of classical swine fever and pseudorabies. Thirty-one States participated in the study. These States accounted for 88.3 percent of pigs and 84.4 percent of operations with fewer than 100 pigs nationally, according to the 2002 Census of Agriculture. The information gathered in this study provided a more complete picture of small-enterprise swine operations.

Swine 2012 is NAHMS’ sixth national study of the U.S. swine industry. Thirteen States participated in Swine 2012. These States accounted for 89.0 percent of swine operations with 100 or more pigs and 90.8 percent of pigs on operations with 100 or more pigs. The study was divided into three parts. The first and second parts targeted producers with 100 or more pigs.

The third part of Swine 2012 focused on operations with fewer than 100 pigs on-site. Thirty-one States participated. These States accounted for 82.7 percent of swine operations with fewer than 100 pigs and 86.9 percent of pigs on operations with fewer than 100 pigs (see map).

All NAHMS swine study reports are accessible online at <http://www.aphis.usda.gov/nahms>.

Swine 2012 Participating States*



*Operations with fewer than 100 pigs.

Terms Used in This Report

Average:

Operation average: A single value entered as a percentage or average, e.g., litters per sow per year for each operation summed over all operations reporting, divided by the number of operations reporting.

Pig-level average: A single operation value is multiplied by the number of animals on that operation. Values are then summed across operations and divided by the total number of animals on all operations.

If average is not qualified as above (operation or pig level), then it refers to a single value not entered as a percentage or average, e.g., sows in inventory on a certain date for each operation summed over all operations reporting, divided by the number of operations reporting.

Breeding swine: In this report, the term “breeding swine” refers to sows and/or gilts. Boars and young males for breeding are usually referred to separately.

Feral swine: In this report, this term refers to feral or wild pigs, including wild boars on hunting clubs or captive on operations.

NA: Not applicable.

Operation: The overall business and management unit for raising swine.

Percent operations: The number of operations with a certain attribute divided by the total number of operations. Percentages will sum to 100 when the attributes are mutually exclusive (e.g., percentage of operations located within each region). Percentages will not sum to 100 when the attributes are not mutually exclusive (e.g., the percentage of operations that had veterinary visits during the last 12 months by type of veterinarians that visited).

Population estimates: Estimates in this report are provided with a measure of precision called the standard error. A 95-percent confidence interval can be approximated with bounds equal to the estimate, plus or minus two standard errors. If the only error is sampling error, the confidence intervals created in this manner will contain the true population mean 95 out of 100 times. Alternatively, the 90-percent confidence interval would be created by multiplying the standard error by 1.65 instead of 2. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported (0.0). If there were no reports of the event, no standard error was reported (—).

Regions:

Northeast: Illinois, Indiana, Michigan, New Jersey, New York, Ohio, Pennsylvania, Wisconsin

Central: Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota

West and South: Alabama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Hawaii, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Washington

Size of operation: Based on the total inventory for each operation on the NASS list sampling frame constructed for this study. Size breakouts are: 1 to 49 pigs and 50 to 99 pigs.

Section I: Population Estimates

Note: Where applicable, column totals are shown as 100.0 to aid in interpretation; however, estimates may not sum to 100.0 due to rounding.

A. Operation Demographics

1. Swine inventory and region

Nearly 9 of 10 operations (88.4 percent) had 1 to 49 pigs.

A.1.a. Percentage of operations by size of operation at time of selection:

Size of operation (number head)	Percent operations	Std. error
1–49	88.4	(0.8)
50–99	11.6	(0.8)
Total	100.0	

Nearly half the operations (46.3 percent) were in the West and South regions.

A.1.b. Percentage of operations by region:

Region	Percent operations	Std. error
Northeast	38.5	(1.6)
Central	15.2	(1.2)
West and South	46.3	(1.6)
Total	100.0	

2. Inventory classes on-hand June 1, 2012

A higher percentage of operations with 50 to 99 pigs than operations with 1 to 49 pigs had every inventory class of pigs on June 1, 2012.

A.2.a. Percentage of operations by inventory class on-hand June 1, 2012, and by size of operation:

Inventory class	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	54.2	(2.3)	87.6	(4.2)	58.1	(2.1)
Boars and young males for breeding	37.9	(2.2)	82.2	(5.0)	42.9	(2.1)
Pigs not yet weaned	21.0	(1.9)	38.7	(5.5)	23.0	(1.8)
Market pigs fed for slaughter	52.1	(2.3)	85.4	(4.5)	55.9	(2.1)
No pigs	17.0	(1.8)	1.9	(1.8)	15.3	(1.6)

A lower percentage of operations in the West/South region had market pigs (45.3 percent) compared with operations in the Northeast and Central regions (62.1 and 72.0 percent, respectively). The percentage of operations with breeding animals was consistent across regions.

A.2.b. Percentage of operations by inventory class on-hand June 1, 2012, and by region:

Inventory class	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	53.1	(3.4)	64.1	(5.2)	60.1	(3.1)
Boars and young males for breeding	40.8	(3.2)	45.0	(5.3)	44.0	(3.1)
Pigs not yet weaned	21.1	(2.8)	25.1	(4.9)	23.9	(2.7)
Market pigs fed for slaughter	62.1	(3.4)	72.0	(4.8)	45.3	(3.1)
No pigs	14.7	(2.4)	9.4	(3.2)	17.7	(2.5)

Over 80 percent of all operations (84.1 percent) had fewer than 10 sows on June 1, 2012, while 92.8 percent had fewer than 3 boars. Over one-third of operations (41.9 percent) had no sows or gilts.

A.2.c. Percentage of operations by number of sows and gilts on-site June 1, 2012, and by region:

Number of sows and gilts	Percent Operations							
	Region							
	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	46.9	(3.4)	35.9	(5.2)	39.9	(3.1)	41.9	(2.1)
1–3	17.9	(2.7)	18.4	(4.2)	28.5	(2.9)	22.9	(1.8)
4–9	20.5	(2.8)	23.0	(4.7)	17.0	(2.4)	19.3	(1.7)
10 or more	14.7	(2.5)	22.8	(4.7)	14.6	(2.0)	15.9	(1.5)
Total	100.0		100.0		100.0		100.0	

A.2.d. Percentage of operations by number of boars and young males for breeding on the operation June 1, 2012, and by region:

Number of boars	Percent Operations							
	Region							
	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	59.2	(3.2)	55.0	(5.3)	56.0	(3.1)	57.1	(2.1)
1	24.5	(2.9)	27.5	(4.9)	27.1	(2.8)	26.1	(1.9)
2	8.8	(2.0)	12.7	(3.2)	9.2	(1.8)	9.6	(1.3)
3	3.7	(1.3)	4.9	(2.4)	2.0	(0.9)	3.1	(0.7)
4 or more	3.8	(1.4)	0.0	(—)	5.8	(1.4)	4.1	(0.9)
Total	100.0		100.0		100.0		100.0	

Nearly three-fourths of all operations with breeding females (72.2 percent) also had one or more boars or young males.

A.2.e. For operations with sows and gilts for breeding, percentage of operations with one or more boars or young males for breeding on June 1, 2012, by region:

	Percent Operations							
	Region							
	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
	76.8	(3.9)	67.9	(6.4)	70.3	(3.8)	72.2	(2.5)

The Central region had the highest percentage of operations with 13 or more market pigs.

A.2.f. Percentage of operations by number of market pigs fed for slaughter on June 1, 2012, and by region:

Number of market pigs	Percent Operations							
	Region							
	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	37.9	(3.4)	28.0	(4.8)	54.7	(3.2)	44.1	(2.1)
1–4	21.1	(2.8)	16.2	(4.1)	21.4	(2.6)	20.5	(1.7)
5–12	20.6	(2.9)	14.7	(4.0)	13.0	(2.1)	16.2	(1.6)
13 or more	20.4	(2.6)	41.1	(5.2)	11.0	(1.9)	19.2	(1.6)
Total	100.0		100.0		100.0		100.0	

3. Seasonality of production

Most operations with 1 to 49 pigs (53.1 percent) and nearly 90 percent of operations with 50 to 99 pigs (89.1 percent) had at least one pig present every month for 12 months.

A.3.a. Percentage of operations by number of months from June 1, 2011, to May 31, 2012, that at least one pig was present on the operation, and by size of operation:

Number of months	Percent Operations					
	Size of Operation (number head)					
	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
1–3	10.5	(1.4)	5.3	(3.0)	9.9	(1.3)
4–6	20.2	(1.8)	1.4	(1.4)	18.0	(1.7)
7–9	8.6	(1.3)	0.0	(—)	7.6	(1.2)
10–11	7.7	(1.2)	4.2	(2.2)	7.3	(1.1)
12	53.1	(2.3)	89.1	(3.9)	57.2	(2.1)
Total	100.0		100.0		100.0	

In each region, most operations had at least one pig present every month for 12 months. A higher percentage of operations in the Central region had pigs present on the operation for the entire 12-month period compared with operations in the Northeast region (69.8 and 51.0 percent, respectively)

A.3.b. Percentage of operations by number of months from June 1, 2011, to May 31, 2012, that at least one pig was present on the operation, and by region:

Number of months	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
1–3	13.5	(2.4)	5.7	(2.4)	8.2	(1.8)
4–6	20.0	(2.7)	17.0	(4.0)	16.7	(2.4)
7–9	9.9	(2.1)	2.5	(1.8)	7.5	(1.7)
10–11	5.6	(1.6)	5.0	(2.4)	9.4	(1.9)
12	51.0	(3.3)	69.8	(4.9)	58.2	(3.2)
Total	100.0		100.0		100.0	

B. Health and Productivity**1. Sows and gilts farrowed**

Over 70 percent of operations (71.4 percent) had at least one farrowing from June 1, 2011, to May 31, 2012. One-third of operations with 1 to 49 pigs had no farrowings compared with only 1.6 percent of operations with 50 to 99 pigs. About half of operations with 1 to 49 pigs had 1 to 9 farrowings compared with about three-fourths of operations with 50 to 99 pigs.

B.1.a. Percentage of operations with sows that had at least one farrowing from June 1, 2011, to May 31, 2012:

Percent Operations					
Size of Operation (number head)					
1-49		50-99		All operations	
Percent	Std. error	Percent	Std. error	Percent	Std. error
66.7	(2.7)	98.4	(1.6)	71.4	(2.3)

B.1.b. Percentage of operations with sows by number of farrowings from June 1, 2011, to May 31, 2012, and by size of operation:

Percent Operations						
Size of Operation (number head)						
Number of farrowings	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	33.3	(2.7)	1.6	(1.6)	28.6	(2.3)
1-9	51.2	(2.9)	27.4	(6.2)	47.6	(2.6)
10-19	7.8	(1.5)	38.4	(6.7)	12.3	(1.7)
20-29	4.1	(1.2)	17.9	(5.4)	6.1	(1.3)
30 or more	3.7	(1.0)	14.7	(4.5)	5.3	(1.1)
Total	100.0		100.0		100.0	

On average, 5.5 sows and gilts were on-hand per boar.

B.1.c. For operations with breeding sows/gilts **and** boars/young males for breeding, operations average number of sows and gilts per breeding male on the operation June 1, 2012, by size of operation:

Operation Average Number of Sows and Gilts per Breeding Male

Size of Operation (number head)

1–49		50–99		All operations	
Average	Std. error	Average	Std. error	Average	Std. error
4.9	(0.4)	7.5	(0.7)	5.5	(0.3)

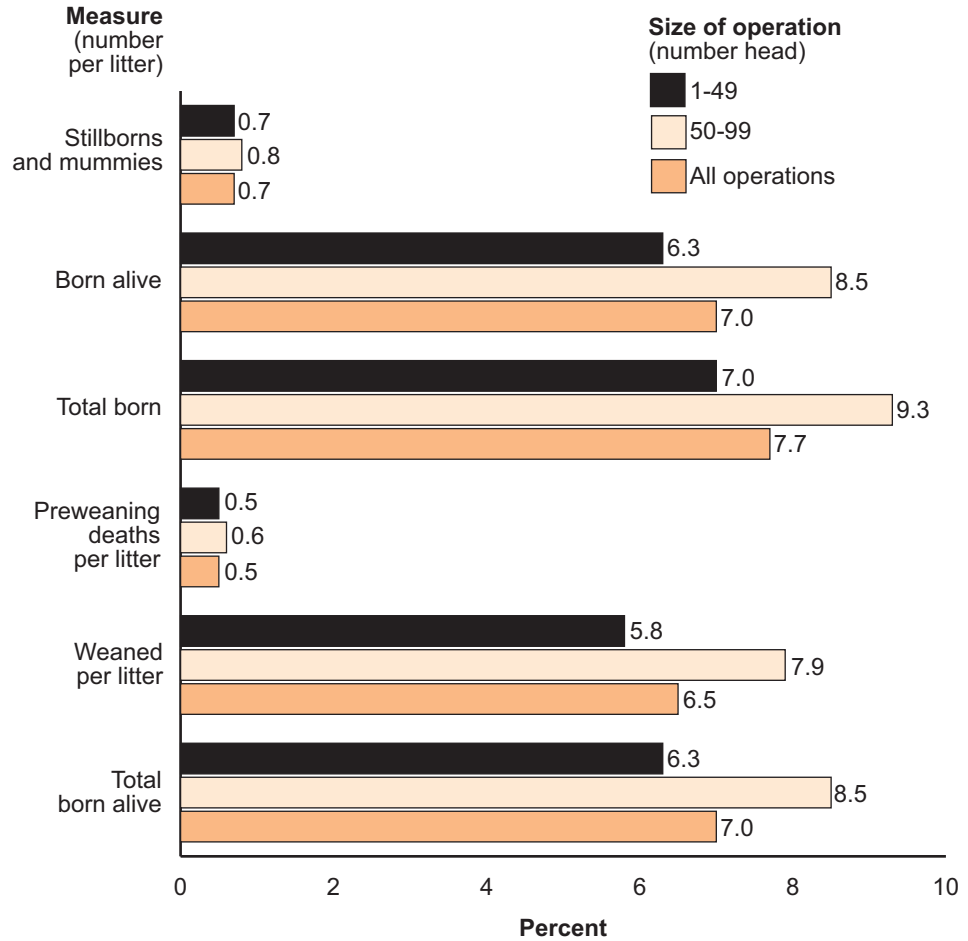
2. Farrowing productivity and preweaning death loss

Operations with 50 to 99 pigs had 2.3 more piglets born per litter on average than operations with 1 to 49 pigs. Operations with 50 to 99 pigs weaned on average 7.9 pigs per litter (or 92.3 percent of those born alive) compared with an average of 5.8 pigs per litter for operations with 1 to 49 pigs.

B.2. Average per-litter productivity (number and percentage) from June 1, 2011, to May 31, 2012, by size of operation:

Average Per Litter Productivity												
Size of Operation (number head)												
Measure (per litter)	1–49				50–99				All operations			
	No.	Std. error	Pct.	Std. error	No.	Std. error	Pct.	Std. error	No.	Std. error	Pct.	Std. error
Stillborns and mummies	0.7	(0.1)	10.1	(1.2)	0.8	(0.1)	8.0	(0.9)	0.7	(0.1)	9.3	(0.8)
Born alive	6.3	(0.7)	89.9	(1.2)	8.5	(0.3)	92.0	(0.9)	7.0	(0.6)	90.7	(0.8)
Total born	7.0	(0.8)	100.0		9.3	(0.3)	100.0		7.7	(0.7)	100.0	
Preweaning deaths per litter	0.5	(0.1)	8.0	(1.2)	0.6	(0.1)	7.7	(1.6)	0.5	(0.1)	7.9	(0.9)
Weaned per litter	5.8	(0.7)	92.0	(1.2)	7.9	(0.3)	92.3	(1.6)	6.5	(0.5)	92.1	(0.9)
Total born alive	6.3	(0.7)	100.0		8.5	(0.3)	100.0		7.0	(0.5)	100.0	

Average per-litter productivity from June 1, 2011, to May 31, 2012, by size of operation



3. Death loss

Overall, 7.8 percent of breeding animals (sows, gilts, and boars) died from June 1, 2011, to May 31, 2012.

B.3.a. Percentage of pigs that died from June 1, 2011, to May 31, 2012, by pig type and by size of operation:

Percent Pigs						
Size of Operation (number head)						
Pig type	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows, gilts, or boars ¹	8.3	(2.5)	6.3	(2.4)	7.8	(2.0)
Preweaned pigs ²	7.9	(1.2)	7.7	(1.6)	7.8	(0.9)
Weaned pigs ³	4.0	(0.6)	2.4	(0.4)	3.4	(0.4)

¹As a percentage of sow/gilt/boar inventory on June 1, 2011.

²As a percentage of pigs born alive from June 1, 2011, to May 31, 2012.

³As a percentage of pigs to be weaned from June 1, 2011, to May 31, 2012.

B.3.b. Percentage of pigs that died from June 1, 2011, to May 31, 2012, by pig type and by region:

Percent Pigs						
Region						
Pig type	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows, gilts, or boars ¹	3.1	(0.7)	4.6	(3.5)	11.7	(2.5)
Preweaned pigs ²	6.6	(1.6)	9.7	(2.1)	7.9	(1.3)
Weaned pigs ³	3.2	(0.6)	2.8	(0.7)	3.8	(0.7)

¹As a percentage of sow/gilt/boar inventory on June 1, 2011.

²As a percentage of pigs born alive from June 1, 2011, to May 31, 2012.

³As a percentage of pigs to be weaned from June 1, 2011, to May 31, 2012.

4. Disease signs

Note: Tables refer to inventory classes defined in tables A.2.a and A.2.b.

No operations with 50 to 99 pigs had a known or suspected problem with porcine reproductive and respiratory syndrome (PRRS) in their sows or gilts from June 1, 2011, to May 31, 2012. This finding might indicate stability in which the strain of PRRS was no longer creating overt clinical signs, or it might indicate difficulty in differentiating PRRS signs from other respiratory problems such as *Mycoplasma*. There were no differences across regions in the percentages of operations reporting any of the listed disease problems.

B.4.a. Percentage of operations with sows in which the following disease problems were known or suspected to have caused sickness or mortality in one or more **sows or gilts** from June 1, 2011, to May 31, 2012, by size of operation:

Disease problem	Percent Operations					
	Size of Operation (number head)					
	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
PRRS	2.3	(0.9)	0.0	(—)	2.0	(0.7)
<i>Mycoplasma pneumonia</i>	3.5	(1.1)	1.1	(1.1)	3.1	(0.9)
Influenza	0.6	(0.4)	0.2	(0.1)	0.5	(0.3)
Porcine circovirus associated disease (PCVAD)	0.3	(0.3)	1.9	(1.9)	0.5	(0.4)
Roundworms	6.5	(1.4)	17.5	(5.2)	8.2	(1.4)
<i>Streptococcus suis</i>	1.3	(0.7)	0.0	(—)	1.1	(0.6)
Diarrhea	3.4	(1.1)	9.5	(4.0)	4.3	(1.1)
Other	2.8	(0.9)	1.2	(1.2)	2.5	(0.8)
Any of the above	13.2	(1.9)	25.8	(5.9)	15.0	(1.9)

No operations with 50 to 99 pigs had a known or suspected problem with PRRS in weaned pigs from June 1, 2011, to May 31, 2012. Of operations with 50 to 99 pigs, 12.1 percent had problems with roundworms in weaned pigs, and 16.1 percent had problems with diarrhea. Although *Streptococcus suis* is common in weaned pigs, no operations with 50 to 99 pigs reported a problem with the disease. There were no differences across regions in the percentages of operations reporting any of the listed disease problems in weaned pigs (data not shown).

B.4.b. Percentage of operations with weaned pigs in which the following disease problems were known or suspected to have caused sickness or mortality in one or more **weaned pigs** from June 1, 2011, to May 31, 2012, by size of operation:

Disease problem	Percent Operations					
	Size of Operation (number head)					
	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
PRRS	2.2	(0.9)	0.0	(—)	1.8	(0.7)
<i>Mycoplasma pneumonia</i>	5.5	(1.4)	9.9	(4.0)	6.2	(1.3)
Influenza	1.5	(0.7)	0.3	(0.2)	1.3	(0.6)
Porcine circovirus associated disease (PCVAD)	1.2	(0.7)	1.8	(1.8)	1.3	(0.6)
Roundworms	8.0	(1.6)	12.1	(4.2)	8.6	(1.5)
<i>Strep. suis</i> (<i>Strep. meningitis</i>)	1.5	(0.7)	0.0	(—)	1.2	(0.6)
Diarrhea	2.6	(1.0)	16.1	(4.9)	4.7	(1.1)
Other	1.9	(0.8)	0.0	(—)	1.6	(0.7)
Any of the above	14.3	(2.1)	28.8	(6.0)	16.6	(2.0)

5. Disease familiarity

Tables in section B.4 showed a lower occurrence of problems with PRRS than expected, especially on operations with 50 to 99 pigs. Part of the reason for this finding might be that producers on 50.2 percent of operations were not at all familiar with the disease. Over 50 percent of operations had no or slight familiarity with all the listed diseases, except influenza.

B.5.a. Percentage of operations by level of producer familiarity with the following diseases:

Disease	Percent Operations										
	Level of Familiarity										
	Not at all		Slight		Somewhat		Very		Extremely		Total
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error		
PRRS	50.2	(2.2)	15.0	(1.6)	18.9	(1.7)	11.5	(1.4)	4.4	(0.9)	100.0
Pseudorabies	30.7	(2.0)	22.1	(1.8)	25.6	(1.9)	16.0	(1.6)	5.6	(1.0)	100.0
Brucellosis	34.8	(2.1)	20.5	(1.8)	24.4	(1.9)	15.6	(1.6)	4.7	(0.9)	100.0
Classical swine fever	48.8	(2.2)	18.2	(1.7)	21.1	(1.8)	9.2	(1.3)	2.7	(0.7)	100.0
Foot-and-mouth disease	28.8	(2.0)	25.4	(1.9)	27.0	(1.9)	14.6	(1.5)	4.2	(0.9)	100.0
Influenza	24.0	(1.9)	22.0	(1.8)	26.9	(2.0)	21.2	(1.8)	6.0	(1.0)	100.0
Toxoplasmosis	59.1	(2.2)	15.2	(1.6)	16.7	(1.6)	6.9	(1.1)	2.1	(0.6)	100.0
Trichinosis	43.2	(2.2)	19.8	(1.8)	22.2	(1.8)	11.0	(1.4)	3.7	(0.8)	100.0

On operations with 50 to 99 pigs, 28.3 percent of producers were very or extremely familiar with PRRS, compared with 14.9 percent of producers on operations with 1 to 49 pigs.

B.5.b. Percentage of operations in which the producer was very or extremely familiar with the following diseases, by size of operation:

Disease	Percent Operations					
	Size of Operation (number head)					
	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
PRRS	14.3	(1.6)	28.3	(5.9)	15.9	(1.6)
Pseudorabies	19.3	(1.8)	40.0	(6.4)	21.6	(1.8)
Brucellosis	19.2	(1.9)	29.6	(6.0)	20.3	(1.8)
Classical swine fever	10.9	(1.5)	20.3	(5.1)	11.9	(1.4)
Foot-and-mouth disease	17.9	(1.8)	26.4	(5.8)	18.8	(1.7)
Influenza	25.5	(2.0)	40.3	(5.9)	27.2	(1.9)
Toxoplasmosis	8.4	(1.3)	13.6	(4.5)	9.0	(1.3)
Trichinosis	14.4	(1.7)	17.3	(5.0)	14.7	(1.6)

The percentages of operations in which the producer was very or extremely familiar with the following diseases did not differ by region.

B.5.c. Percentage of operations in which the producer was very or extremely familiar with the following diseases, by region:

Disease	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
PRRS	17.1	(2.7)	19.7	(4.5)	13.7	(2.2)
Pseudorabies	20.1	(2.8)	29.7	(5.1)	20.2	(2.5)
Brucellosis	16.1	(2.6)	21.7	(4.7)	23.3	(2.7)
Classical swine fever	9.1	(2.1)	14.5	(4.1)	13.3	(2.2)
Foot-and-mouth disease	16.8	(2.6)	19.2	(4.6)	20.4	(2.6)
Influenza	21.8	(2.9)	32.3	(5.2)	29.9	(2.9)
Toxoplasma	9.0	(2.1)	11.6	(3.7)	8.1	(1.7)
Trichinosis	12.1	(2.4)	19.1	(4.5)	15.4	(2.3)

C. General Management

1. Proximity to other swine operations

Distance between operations is thought to be an important component of biosecurity. Most swine operations were separated by at least 5 miles.

C.1.a. Percentage of operations by distance (miles) to the nearest known operation with pigs, and by region:

Distance (miles)	Percent Operations							
	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Less than 0.5	4.8	(1.7)	6.5	(2.9)	4.1	(1.4)	4.8	(1.0)
0.5–0.9	3.8	(1.5)	4.1	(2.3)	4.3	(1.5)	4.1	(1.0)
1.0–2.9	18.7	(3.0)	38.1	(5.5)	18.4	(2.9)	21.8	(2.0)
3.0–4.9	24.7	(3.3)	12.9	(4.1)	15.9	(2.7)	18.9	(1.9)
5.0 or more	48.0	(3.8)	38.3	(5.7)	57.3	(3.6)	50.5	(2.4)
Total	100.0		100.0		100.0		100.0	

Regardless of size or region, it appears that for most operations no more than three swine operations were located within 3 miles. About half the operations in the Central region (48.8 percent) had at least one swine operation within 3 miles.

C.1.b. Percentage of operations by number of swine operations within 3 miles, and by size of operation:

Percent Operations						
Size of Operation (number head)						
Number sites	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	69.6	(2.4)	68.4	(5.7)	69.4	(2.2)
1-3	24.8	(2.2)	23.2	(5.3)	24.6	(2.1)
4-6	4.0	(1.0)	8.4	(3.9)	4.6	(1.0)
7-9	0.5	(0.4)	0.0	(--)	0.5	(0.3)
10 or more	1.1	(0.6)	0.0	(--)	1.0	(0.5)
Total	100.0		100.0		100.0	

C.1.c. Percentage of operations by number of swine operations within 3 miles, and by region:

Percent Operations						
Region						
Number sites	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	72.7	(3.4)	51.2	(5.7)	73.2	(3.2)
1-3	20.9	(3.1)	39.3	(5.8)	22.4	(3.0)
4-6	5.6	(1.8)	7.1	(2.9)	2.7	(1.2)
7-9	0.0	(—)	1.2	(1.2)	0.6	(0.6)
10 or more	0.8	(0.8)	1.2	(1.2)	1.1	(0.8)
Total	100.0		100.0		100.0	

2. Reasons for raising pigs

Many producers did not raise pigs for the money; 42.7 percent of operations indicated that income was not an important reason for raising pigs. Over 50 percent of producers indicated that raising pigs as a learning experience for kids or for personal consumption were very or extremely important.

C.2.a. Percentage of operations by level of importance producer placed on the following reasons for raising pigs:

Reason	Percent Operations										
	Level of Importance										
	Not at all		Slightly		Somewhat		Very		Extremely		Total
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error		
Family tradition	27.6	(2.0)	10.0	(1.3)	20.2	(1.7)	27.7	(2.0)	14.4	(1.5)	100.0
Fun/hobby	25.2	(1.9)	12.3	(1.5)	22.9	(1.8)	26.7	(2.0)	12.9	(1.5)	100.0
Source of income	42.7	(2.2)	13.5	(1.5)	19.0	(1.7)	13.1	(1.5)	11.7	(1.4)	100.0
Meat for personal consumption	19.9	(1.8)	9.4	(1.3)	14.8	(1.5)	29.6	(2.0)	26.3	(1.9)	100.0
Clubs (e.g., 4-H)	51.1	(2.2)	6.5	(1.1)	7.0	(1.1)	17.1	(1.7)	18.3	(1.7)	100.0
Learning experience for kids	30.5	(2.0)	5.4	(1.0)	13.5	(1.5)	28.4	(2.0)	22.2	(1.8)	100.0
Other reasons for raising pigs	87.0	(1.5)	0.7	(0.4)	1.5	(0.6)	5.1	(1.0)	5.7	(1.0)	100.0

Producers on a higher percentage of operations with 50 to 99 pigs rated source of income as a very or extremely important reason to raise pigs compared with producers on operations with 1 to 49 pigs (62.2 and 20.1 percent, respectively).

C.2.b. Percentage of operations in which the producer rated the following reasons for raising pigs as very or extremely important, by size of operation:

Reason	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Family tradition	41.0	(2.3)	50.5	(6.5)	42.1	(2.2)
Fun/hobby	39.7	(2.3)	38.8	(6.2)	39.6	(2.1)
Source of income	20.1	(1.9)	62.2	(6.1)	24.8	(1.8)
Meat for personal consumption	57.3	(2.3)	45.2	(6.6)	55.9	(2.2)
Clubs (e.g., 4-H)	36.0	(2.2)	31.3	(6.2)	35.4	(2.1)
Learning experience for kids	51.3	(2.3)	44.5	(6.4)	50.6	(2.2)
Other reasons for raising pigs	10.4	(1.4)	14.0	(4.5)	10.8	(1.4)

Producers on a lower percentage of operations in the West/South region (44.7 percent) raised pigs for personal consumption than producers on operations in the Northeast and Central regions (65.8 and 65.4 percent, respectively).

C.2.c. Percentage of operations in which the producer rated the following reasons for raising pigs as very or extremely important, by region:

Reason	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Family tradition	41.4	(3.5)	48.7	(5.7)	40.6	(3.2)
Fun/hobby	35.3	(3.4)	41.6	(5.5)	42.4	(3.2)
Source of income	24.0	(2.8)	27.9	(5.1)	24.5	(2.6)
Meat for personal consumption	65.8	(3.3)	65.4	(5.3)	44.7	(3.2)
Clubs (e.g., 4-H)	31.1	(3.3)	34.4	(5.4)	39.4	(3.1)
Learning experience for kids	46.3	(3.5)	45.0	(5.7)	55.9	(3.2)
Other reasons for raising pigs	10.8	(2.2)	10.4	(3.5)	11.0	(2.0)

3. Use of a veterinarian

Overall, a much higher percentage of operations were visited by a local veterinarian (25.2 percent) than by a State or Federal veterinarian (4.0 percent).

C.3.a. Percentage of operations visited by a veterinarian from June 1, 2011, to May 31, 2012, by type of veterinarian and by size of operation:

Percent Operations						
Size of Operation (number head)						
Veterinarian type	1–49		50–99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Local practitioner	23.7	(2.0)	36.9	(6.1)	25.2	(1.9)
State or Federal	3.5	(0.8)	7.9	(3.3)	4.0	(0.8)
Either	25.5	(2.0)	42.3	(6.3)	27.4	(1.9)
Other type	1.3	(0.5)	3.5	(2.4)	1.6	(0.5)

C.3.b. Percentage of operations visited by a veterinarian from June 1, 2011, to May 31, 2012, by type of veterinarian and by region:

Percent Operations						
Region						
Veterinarian type	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Local practitioner	26.4	(3.1)	28.0	(4.5)	23.2	(2.7)
State or Federal	3.5	(1.3)	2.4	(1.6)	4.9	(1.2)
Either	27.9	(3.2)	28.0	(4.5)	26.8	(2.9)
Other type	2.6	(1.1)	1.3	(1.2)	0.8	(0.6)

Most operations were not visited by any type of veterinarian from June 1, 2011, to May 31, 2012.

C.3.c. Percentage of operations by number of times a veterinarian visited for any purpose from June 1, 2011, to May 31, 2012, and by type of veterinarian:

Veterinarian type	Percent Operations								Total
	Number Visits								
	0		1		2–4		5 or more		
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	
Local practitioner	74.8	(1.9)	10.0	(1.3)	11.8	(1.4)	3.3	(0.8)	100.0
State or Federal	96.0	(0.8)	2.5	(0.6)	1.1	(0.4)	0.4	(0.3)	100.0
Other type	98.4	(0.5)	0.7	(0.4)	0.2	(0.2)	0.6	(0.3)	100.0

4. Feed sources

Almost two-thirds of operations with 50 to 99 pigs used home-raised feed or purchased feed ingredients and mixed them on the operation. In comparison, about one-third of operations with 1 to 49 pigs used home-raised feed or purchased feed ingredients mixed on the operation. About 4 of 10 operations with 1 to 49 pigs purchased a commercial diet. In addition, operations with 1 to 49 pigs were nearly twice as likely as operations with 50 to 99 pigs to feed table-food scraps.

C.4.a. Percentage of operations by feed source(s) used for pigs from June 1, 2011, to May 31, 2012, and by size of operation:

Feed source	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Home-raised sources (e.g., harvested corn or soybeans)	37.9	(2.2)	64.9	(6.3)	40.9	(2.1)
Purchased feed ingredients, mixed on this operation	39.2	(2.3)	66.5	(6.1)	42.2	(2.2)
Custom feed mixed off operation	24.3	(2.0)	33.7	(6.1)	25.4	(1.9)
Purchased commercial diet	43.7	(2.3)	29.2	(5.9)	42.1	(2.2)
Commercial food waste, excluding commercial meat and bone meal mix	7.9	(1.2)	6.0	(2.6)	7.7	(1.1)
Table-food waste, excluding commercial meat and bone meal mix	23.6	(2.0)	12.0	(3.4)	22.4	(1.8)
Coproducts (e.g., distillers dried grain, wet grain, etc.)	10.0	(1.4)	10.2	(4.1)	10.0	(1.3)
Crops in fields that pigs have been turned-out on	7.4	(1.2)	13.2	(4.4)	8.0	(1.2)
Wildlife carcasses, excluding rats and mice	0.2	(0.2)	0.0	(—)	0.2	(0.2)

Given that a lot of corn is grown in the Northeast and Central regions, it was not surprising that a higher percentage of operations in these regions used home-raised sources to feed pigs than operations in the West/South region. A lower percentage of operations in the West/South region used custom feed mixed off the operation compared with operations in the Northeast and Central regions.

C.4.b. Percentage of operations by feed source(s) used for pigs from June 1, 2011, to May 31, 2012, and by region:

Feed source	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Home-raised sources (e.g., harvested corn or soybeans)	52.2	(3.5)	54.9	(5.4)	26.9	(2.8)
Purchased feed ingredients, mixed on this operation	44.1	(3.4)	46.0	(5.5)	39.5	(3.2)
Custom feed mixed off operation	30.7	(3.3)	35.0	(5.3)	17.7	(2.5)
Purchased commercial diet	36.8	(3.5)	40.0	(5.6)	47.3	(3.2)
Commercial food waste, excluding commercial meat and bone-meal mix	7.3	(1.8)	5.8	(2.5)	8.7	(1.7)
Table-food waste, excluding commercial meat and bone meal mix	21.1	(2.8)	21.1	(4.5)	23.8	(2.7)
Coproducts (e.g., distillers dried grain, wet grain, etc.)	7.1	(1.8)	13.4	(3.9)	11.3	(2.0)
Crops in fields that pigs have been turned-out on	6.0	(1.7)	9.3	(3.4)	9.2	(1.9)
Wildlife carcasses, excluding rats and mice	0.0	(—)	0.0	(—)	0.4	(0.4)

Nearly 40 percent of operations with weaned pigs added antibiotics to feed intended for weaned pigs. A higher percentage of operations with 50 to 99 pigs added antibiotics to feed intended for weaned pigs (56.8 percent) compared with operations with 1 to 49 pigs (36.1 percent).

C.4.c. Percentage of operations with weaned pigs that added antibiotics to feed intended for weaned pigs, by size of operation:

Percent Operations					
Size of Operation (number head)					
1-49		50-99		All operations	
Percent	Std. error	Percent	Std. error	Percent	Std. error
36.1	(2.8)	56.8	(6.7)	39.5	(2.6)

5. Carcass disposal

The percentages of operations by carcass disposal methods did not differ by the type of pig that died. The majority of operations buried dead pigs on the operation.

C.5.a. For operations that had at least one pig die from June 1, 2011, to May 31, 2012, percentage of operations by method of carcass disposal and by pig type:

Percent Operations						
Pig Type Death						
Method of carcass disposal	Sow, gilt, or boar		Weaned		Any*	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Burial on operation	67.1	(5.3)	65.3	(4.6)	66.3	(3.8)
Burning on operation	8.9	(3.2)	6.7	(2.5)	10.2	(2.4)
Renderer pickup on operation	5.4	(2.3)	4.7	(2.0)	4.5	(1.5)
Renderer pickup outside operation	0.7	(0.7)	0.5	(0.5)	0.4	(0.4)
Composting on operation	9.1	(3.4)	10.9	(3.1)	9.1	(2.3)
Composting off operation	3.6	(2.1)	3.6	(1.8)	3.0	(1.3)
Other	8.0	(3.1)	8.3	(2.6)	9.6	(2.4)

*Includes sows, gilts, boars and weaned pigs only.

C.5.b. Percentage of pig deaths from June 1, 2011, to May 31, 2012, by type of pig and by method of carcass disposal:

Percent Pig Deaths						
Method of carcass disposal	Pig Type					
	Sow, gilt, or boar		Weaned pig		Any*	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Burial on operation	32.2	(12.2)	55.7	(8.4)	47.9	(9.2)
Burning on operation	9.1	(5.8)	12.8	(5.6)	13.2	(5.3)
Renderer pickup on operation	31.9	(21.1)	9.9	(7.4)	16.5	(12.4)
Renderer pickup outside operation	1.4	(1.4)	1.8	(1.8)	1.6	(1.6)
Composting on operation	4.7	(3.1)	7.7	(3.2)	6.3	(2.4)
Composting off operation	1.5	(1.0)	8.4	(4.7)	5.6	(3.2)
Other	19.2	(13.4)	3.7	(1.5)	8.8	(4.8)
Total	100.0		100.0		100.0	

*Includes sows, gilts, boars and weaned pigs only.

D. Facility Management: Sows and/or Gilts and Weaned Market Pigs

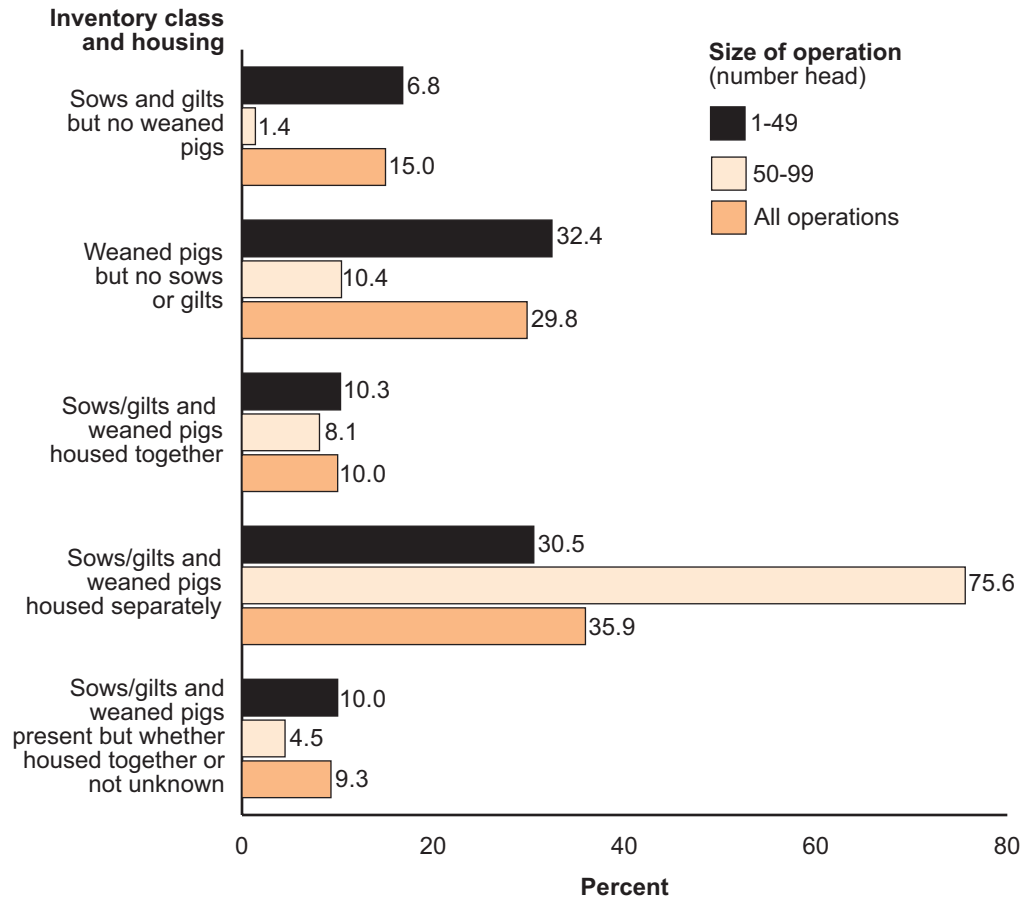
1. Inventory class

A higher percentage of operations with 1 to 49 pigs raised just one pig type compared with operations with 50 to 99 pigs. For example, 32.4 percent of operations with 1 to 49 pigs kept only weaned pigs compared with 10.4 percent of operations with 50 to 99 pigs. In contrast, 88.2 percent of operations with 50 to 99 pigs kept both breeding and weaned pigs compared with 50.8 percent of operations with 1 to 49 pigs.

D.1.a. Percentage of operations by inventory class and housing situation from June 1, 2011, to May 31, 2012, and by size of operation:

Inventory class and housing	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts but no weaned pigs	16.8	(1.8)	1.4	(1.4)	15.0	(1.6)
Weaned pigs but no sows or gilts	32.4	(2.2)	10.4	(4.0)	29.8	(2.0)
Sows/gilts and weaned pigs housed together	10.3	(1.4)	8.1	(3.7)	10.0	(1.3)
Sows/gilts and weaned pigs housed separately	30.5	(2.2)	75.6	(5.4)	35.9	(2.1)
Sows/gilts and weaned pigs present but whether housed together or not unknown	10.0	(1.4)	4.5	(2.6)	9.3	(1.3)
Total	100.0		100.0		100.0	

Percentage of operations by inventory class and housing situation from June 1, 2011, to May 31, 2012, and by size of operation



A higher percentage of operations in the West/South region (21.8 percent) kept only sows and gilts compared with operations in the Northeast and Central regions (10.1 and 7.0 percent, respectively). A higher percentage of operations in the Northeast region (38.2 percent) kept only weaned pigs compared with operations in the West/South region (22.3 percent).

D.1.b. Percentage of operations by inventory class and housing situation from June 1, 2011, to May 31, 2012, and by region:

Inventory class and housing	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts but no weaned pigs	10.1	(2.1)	7.0	(3.0)	21.8	(2.7)
Weaned pigs but no sows or gilts	38.2	(3.4)	31.0	(5.1)	22.3	(2.7)
Sows/gilts and weaned pigs housed together	7.0	(1.8)	7.4	(3.0)	13.5	(2.3)
Sows/gilts and weaned pigs housed separately	35.6	(3.3)	47.7	(5.5)	32.1	(3.0)
Sows/gilts and weaned pigs present but whether housed together or not unknown	9.0	(2.1)	6.8	(2.7)	10.4	(2.0)
Total	100.0		100.0		100.0	

2. Facility type

Less than 10 percent of operations that housed breeding animals and weaned pigs together did so in total confinement. When sows/gilts and weaned pigs were housed separately, the highest percentage of operations housed sows/gilts and weaned pigs in open buildings with outside access. When weaned pigs and sows/gilts were housed separately, a higher percentage of operations housed weaned pigs in total confinement than housed sows/gilts in total confinement (18.2 and 7.9 percent, respectively)

D.2.a. For operations with sows/gilts and weaned pigs, percentage of operations by type of facility used most from June 1, 2011, to May 31, 2012, for **sows and gilts** housed with and without weaned pigs:

Facility type	Percent Operations					
	Housed					
	With weaned pigs		Separately from weaned pigs		All	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Total confinement with mechanical ventilation	9.4	(4.5)	7.9	(2.0)	8.2	(1.8)
Open building with no outside access	21.8	(5.9)	13.2	(2.5)	15.0	(2.3)
Open building with outside access	27.0	(6.4)	43.8	(3.7)	40.3	(3.2)
Fenced lot with or without hut/shelter	22.4	(6.2)	23.9	(3.2)	23.6	(2.8)
Fenced pasture with or without hut/shelter	17.2	(5.6)	10.2	(2.3)	11.6	(2.1)
No facilities; pigs roam free with no fence	2.2	(2.1)	1.0	(0.7)	1.3	(0.7)
Total	100.0		100.0		100.0	

D.2.b. For operations with sows/gilts and weaned pigs, percentage of operations by type of facility used most from June 1, 2011, to May 31, 2012, for **weaned pigs** housed with and without sows and gilts:

Facility type	Percent Operations					
	Housed					
	With sows/gilts		Separately from sows/gilts		All	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Total confinement with mechanical ventilation	9.4	(4.5)	18.2	(2.8)	16.4	(2.4)
Open building with no outside access	21.8	(5.9)	15.5	(2.7)	16.8	(2.4)
Open building with outside access	27.0	(6.4)	44.7	(3.6)	41.0	(3.2)
Fenced lot with or without hut/shelter	22.4	(6.2)	15.5	(2.6)	16.9	(2.5)
Fenced pasture with or without hut/shelter	17.2	(5.6)	4.9	(1.6)	7.5	(1.7)
No facilities; pigs roam free with no fence	2.2	(2.1)	1.2	(0.8)	1.4	(0.8)
Total	100.0		100.0		100.0	

3. Flooring

A solid surface was the primary flooring type used by the majority of operations that housed sows and gilts in buildings with no outside access. Dirt/pasture was the primary flooring type used by the highest percentage of operations in which sows and gilts had outside access.

D.3.a. For operations with sows and gilts, (whether housed separately or with weaned pigs), percentage of operations by primary flooring type used and by facility type:

Flooring type	Percent Operations					
	Facility Type					
	No outside access		Outside access		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Solid surface	71.2	(5.2)	26.8	(2.6)	36.3	(2.5)
Partial slats	5.1	(2.5)	3.0	(1.0)	3.4	(1.0)
Completely slatted	5.7	(2.8)	0.8	(0.5)	1.8	(0.7)
Mesh	1.3	(1.2)	0.4	(0.4)	0.6	(0.4)
Dirt/pasture	14.2	(4.0)	65.9	(2.8)	54.9	(2.5)
Other	2.6	(1.8)	3.1	(1.0)	3.0	(0.9)
Total	100.0		100.0		100.0	

On operations with weaned pigs that had outside access (whether or not the pigs were primarily contained in a building) the primary floor type was more likely to be dirt than a solid surface (55.8 and 34.8 percent of operations, respectively).

D.3.b. For operations with weaned pigs (whether housed separately or with sows and gilts), percentage of operations by primary flooring type used and by facility type:

Flooring type	Percent Operations					
	Facility Type					
	No outside access		Outside access		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Solid surface	66.1	(4.5)	34.8	(3.0)	44.5	(2.6)
Partial slats	11.3	(3.1)	2.2	(1.0)	5.0	(1.2)
Completely slatted	4.6	(2.0)	2.5	(1.0)	3.2	(0.9)
Mesh	4.1	(1.7)	0.0	(—)	1.3	(0.5)
Dirt/pasture	8.5	(2.7)	55.8	(3.1)	41.2	(2.5)
Other	5.4	(2.1)	4.6	(1.4)	4.8	(1.1)
Total	100.0		100.0		100.0	

4. Housing type

There has been great deal of media coverage about the use of individual and group housing for breeding animals. Most operations in this study (56.4 percent) used group housing.

D.4.a. For operations with sows and gilts (whether housed separately or with weaned pigs), percentage of operations by housing type used for most sows and gilts, and by facility type:

Housing type	Percent Operations					
	Facility Type					
	No outside access		Outside access		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Individual stall	39.2	(5.6)	23.1	(2.5)	26.6	(2.3)
Group housing (e.g., pens)	58.3	(5.6)	55.9	(3.0)	56.4	(2.6)
Other	2.5	(1.7)	21.0	(2.4)	17.0	(2.0)
Total	100.0		100.0		100.0	

Given that weaned pigs are always growing and comprise the biggest part of any inventory, it is surprising that any operations would house them individually. On most operations (72.3 percent) weaned pigs were kept in group housing.

D.4.b. For operations with weaned pigs (whether housed separately or with sows and gilts), percentage of operations by housing type used for most weaned pigs, and by facility type:

Housing type	Percent Operations					
	Facility Type					
	No outside access		Outside access		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Individual stall	15.6	(3.5)	5.4	(1.5)	8.6	(1.5)
Group housing (e.g., pens)	79.7	(3.8)	68.9	(3.0)	72.3	(2.4)
Other	4.7	(2.0)	25.7	(2.8)	19.2	(2.1)
Total	100.0		100.0		100.0	

D.4.c. For operations with weaned pigs (whether housed separately or with sows and gilts), percentage of weaned pigs by housing type used for most weaned pigs and by facility type:

Housing type	Percent Pigs ¹					
	Facility Type					
	No outside access		Outside access		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Individual stall	8.9	(7.4)	1.2	(0.7)	4.4	(2.9)
Group housing (e.g., pens)	89.8	(7.7)	64.9	(7.0)	75.2	(6.7)
Other	1.3	(1.0)	33.9	(7.0)	20.5	(5.9)
Total	100.0		100.0		100.0	

¹ The denominator used was the number of market pigs fed for slaughter, including sows and boars no longer used for breeding on June 1, 2012.

5. Rodent control

Overall, 68.9 percent of operations used cats for rodent control, while 42.9 percent of operations used bait or poison to control rodents. It is unknown whether cats had access to pigs on these operations, but it is known that many producers were not familiar with *Toxoplasma* (table B.5.a) or the potential role cats play in the spread of this disease. A higher percentage of operations with 50 to 99 pigs used bait or poison to control rodents compared with operations with 1 to 49 pigs.

D.5.a. Percentage of operations by rodent control method used and by size of operation:

Control method	Percent Operations					
	Size of Site (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Cats	67.6	(2.2)	78.9	(4.5)	68.9	(2.0)
Dogs	35.5	(2.2)	34.0	(5.8)	35.3	(2.1)
Traps	25.5	(2.0)	32.4	(5.9)	26.3	(1.9)
Bait or poison	40.6	(2.3)	61.0	(5.9)	42.9	(2.1)
Professional exterminator	3.5	(0.9)	1.8	(1.8)	3.3	(0.8)
Other	4.3	(1.0)	4.6	(2.6)	4.3	(0.9)
Any	86.7	(1.6)	92.4	(3.0)	87.4	(1.5)

A higher percentage of operations in the Northeast and Central regions used any rodent control (in particular cats and bait or poison) compared with the operations in the West/South region.

D.5.b. Percentage of operations by rodent control method used and by region:

Control method	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Cats	78.0	(2.9)	79.7	(4.4)	57.8	(3.2)
Dogs	36.1	(3.4)	38.7	(5.5)	33.6	(3.0)
Traps	31.8	(3.3)	26.3	(5.1)	21.6	(2.6)
Bait or poison	53.2	(3.5)	49.7	(5.5)	32.2	(3.0)
Professional exterminator	2.6	(1.1)	1.1	(1.1)	4.7	(1.4)
Other	4.6	(1.5)	3.7	(2.1)	4.3	(1.3)
Any	93.8	(1.7)	92.3	(3.0)	80.4	(2.6)

E. Feral Swine**1. Producer-reported presence of feral swine**

Producers on 32.2 percent of operations reported that feral swine were present in their county, while producers on 21.9 percent of operations did not know if feral swine were present in their county. Producers on 52.9 of operations in the West/South region reported that feral swine were present in their county compared with producers on 16.3 percent of operations in the Northeast region and 9.5 percent in the Central region.

E.1.a. Percentage of operations in which the producer reported that feral swine were present in their county (including pigs on hunting clubs or captive on farms), by region:

Percent Operations								
Region								
Response	Northeast		Central		West/South		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Yes	16.3	(2.7)	9.5	(3.4)	52.9	(3.0)	32.2	(1.9)
No	55.3	(3.5)	63.2	(5.4)	32.4	(2.8)	45.9	(2.1)
Don't know	28.4	(3.1)	27.3	(5.0)	14.7	(2.3)	21.9	(1.8)
Total	100.0		100.0		100.0		100.0	

Producers on 7.8 of operations reported seeing feral swine on the operation in the past year. Not surprisingly, producers in the in the West/South region reported seeing feral swine on their operations more often than producers in the other regions (16.2 percent).

E.1.b. Percentage of operations in which the producer saw feral swine on the operation during the previous 12 months, by region:

Percent Operations							
Region							
Northeast		Central		West/South		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0.5	(0.5)	1.5	(1.4)	16.2	(2.3)	7.8	(1.1)

Overall, producers on 3.1 percent of operations reported seeing feral swine on the operation once or twice during the previous 12 months.

E.1.c. Percentage of operations by number of times producer had seen feral swine on the operation during the previous 12 months:

Number times seen	Percent operations	Std. error
0	92.2	(1.1)
1–2	3.1	(0.8)
3–4	2.2	(0.6)
5–6	0.0	(—)
7 or more	2.5	(0.7)
Total	100.0	

Producers on 16.4 percent of operations that saw feral swine during the previous 12 months indicated that feral swine might have entered or gained access to facilities used to house pigs or store feed.

E.1.d. For operations in which the producer had seen feral swine on the operation during the previous 12 months, percentage of operations in which the producer indicated that there was evidence that the feral swine had entered or gained access to facilities used to house swine or store feed:

Percent operations	Std. error
16.4	(6.1)

F. Pig Movement On and Off the Operation

1. Pigs added to operation

Nearly half of operations (44.5 percent) did not add any new pigs from an outside source from June 1, 2011, to May 31, 2012. When operations with 1 to 49 pigs added pigs for any reason, the highest percentage added 2 to 5 pigs.

F.1.a. Percentage of operations by number of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, and by size of operation:

Number added	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	42.7	(2.3)	58.1	(6.2)	44.5	(2.1)
1	6.3	(1.1)	4.9	(2.6)	6.2	(1.1)
2-5	26.1	(2.0)	22.3	(5.4)	25.6	(1.9)
6-9	9.5	(1.4)	0.1	(0.1)	8.4	(1.2)
10 or more	15.4	(1.7)	14.6	(4.3)	15.3	(1.6)
Total	100.0		100.0		100.0	

A higher percentage of operations in the Central region added no pigs during the previous year compared with operations in the Northeast region.

F.1.b. Percentage of operations by number of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, and by region:

	Percent Operations					
	Region					
	Northeast		Central		West/South	
Number added	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	38.3	(3.4)	58.1	(5.2)	45.1	(3.2)
1	8.0	(1.9)	2.2	(1.5)	6.0	(1.6)
2–5	29.4	(3.2)	21.7	(4.4)	23.8	(2.8)
6–9	8.0	(1.9)	5.6	(2.4)	9.7	(1.9)
10 or more	16.3	(2.6)	12.5	(3.5)	15.4	(2.3)
Total	100.0		100.0		100.0	

A higher percentage of operations with 1 to 49 pigs (52.4 percent) added feeder pigs compared with operations with 50 to 99 pigs (24.8 percent).

F.1.c. For operations that added pigs (either temporarily or permanently) from June 1, 2011, to May 31, 2012, percentage of operations by type of pigs added and by size of operation:

	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
Pig type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	22.5	(2.6)	45.3	(9.9)	24.5	(2.5)
Boars and young males for breeding	16.9	(2.3)	28.9	(9.1)	18.0	(2.3)
Newly weaned pigs	21.2	(2.5)	8.7	(4.8)	20.1	(2.3)
Feeder pigs	52.4	(3.1)	24.8	(8.5)	50.0	(2.9)
Other	9.2	(1.8)	13.7	(6.8)	9.6	(1.7)

F.1.d. For operations that added pigs (either temporarily or permanently) from June 1, 2011, to May 31, 2012, percentage of operations by type of pigs added and by region:

Pig type	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	21.3	(3.7)	16.2	(6.2)	29.5	(4.0)
Boars and young males for breeding	24.8	(4.0)	17.2	(6.4)	11.8	(2.8)
Newly weaned pigs	15.2	(3.2)	10.0	(4.7)	27.2	(3.9)
Feeder pigs	54.8	(4.5)	61.1	(8.2)	42.9	(4.3)
Other	4.2	(1.9)	11.5	(5.5)	14.1	(3.0)

A higher percentage of the pigs added to operations with 1 to 49 pigs (21.7 percent) were newly weaned compared with the added pigs on operations with 50 to 99 pigs (2.3 percent). Feeder pigs represented 84.9 percent of all pigs added to operations with 50 to 99 pigs and 90.1 percent of pigs added to operations in the Central region.

F.1.e. Percentage of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, by type of pigs added and by size of operation:

Pig type	Percent Pigs					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	10.3	(3.4)	2.4	(1.7)	7.1	(2.6)
Boars and young males for breeding	2.3	(0.6)	0.5	(0.4)	1.6	(0.5)
Newly weaned pigs	21.7	(5.5)	2.3	(1.6)	14.0	(4.5)
Feeder pigs	58.1	(6.7)	84.9	(10.8)	68.8	(8.1)
Other	7.6	(3.8)	9.8	(9.2)	8.5	(4.2)
Total	100.0		100.0		100.0	

F.1.f. Percentage of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, by type of pigs added and by region:

Pig type	Percent Pigs					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows and gilts for breeding	7.1	(2.7)	1.9	(1.2)	8.5	(4.4)
Boars and young males for breeding	3.3	(1.1)	1.2	(0.8)	1.0	(0.5)
Newly weaned pigs	16.3	(5.9)	4.3	(2.6)	15.5	(7.4)
Feeder pigs	70.9	(8.2)	90.1	(4.4)	62.3	(14.5)
Other	2.4	(1.6)	2.5	(1.7)	12.8	(7.6)
Total	100.0		100.0		100.0	

2. Origin of pigs added to operation

Nearly one-third of all operations that added at least one pig from June 1, 2011, to May 31, 2012, got the pigs from other producers in their counties.

F.2.a. For operations that added at least one pig to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, percentage of operations by primary source of added pigs and by size of operation:

Primary source	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Auction/market in this county	11.1	(1.9)	0.3	(0.3)	10.1	(1.8)
Auction/market outside this county	11.5	(2.0)	18.2	(7.3)	12.0	(1.9)
Other producer in this county	33.3	(2.9)	25.3	(7.7)	32.6	(2.7)
Other producer outside this county	29.2	(2.8)	47.1	(10.3)	30.8	(2.7)
Other in this county	12.6	(2.1)	8.4	(5.7)	12.2	(1.9)
Other outside this county	4.5	(1.3)	0.7	(0.4)	4.2	(1.2)

F.2.b. For operations that added at least one pig (either temporarily or permanently) from June 1, 2011, to May 31, 2012, percentage of operations by primary source of added pigs and by region:

Primary source	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Auction/market in this county	15.4	(3.2)	8.7	(4.8)	5.7	(2.1)
Auction/market outside this county	11.6	(2.9)	7.9	(4.3)	13.5	(2.9)
Other producer in this county	37.1	(4.3)	44.3	(8.3)	25.4	(3.7)
Other producer outside this county	27.1	(4.0)	31.1	(7.7)	34.1	(4.2)
Other in this county	8.5	(2.6)	8.7	(4.8)	16.5	(3.2)
Other outside this county	3.8	(1.8)	0.0	(—)	5.5	(2.0)

Roughly three-fourths of pigs added to operations came from other producers, and about 20 percent came from auctions/markets.

F.2.c. Percentage of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, by primary source of added pigs and by type of pigs added:

Primary source	Percent Pigs										
	Pig Type										
	Sows and gilts for breeding		Boars for breeding		Newly weaned pigs		Feeder pigs		Other	All pigs	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	
Auction/market	18.2	(7.9)	11.8	(5.7)	23.3	(8.6)	16.8	(8.2)	*	19.8	(6.0)
Other producer	73.8	(9.5)	67.7	(10.3)	68.1	(11.1)	74.8	(11.0)	*	71.7	(7.9)
Other	7.9	(3.9)	20.5	(10.1)	8.6	(5.5)	8.4	(4.8)	*	8.6	(3.5)
Total	100.0		100.0		100.0		100.0		100.0		100.0

*Too few to report.

Almost half of the pigs added came from a source within the operation's county.

F.2.d. Percentage of pigs added to the operation (either temporarily or permanently) from June 1, 2011, to May 31, 2012, that came from a source within the operation's county, by type of pig added:

Percent Pigs											
Pig Type											
Sows and gilts for breeding		Boars for breeding		Newly weaned pigs		Feeder pigs		Other		All pigs	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
60.1	(12.7)	54.7	(8.9)	57.1	(9.2)	33.4	(12.0)	¹		38.8 ²	(10.3)

¹Too few to report.

²Number revised on 8-13-2014.

3. Pigs permanently removed from operation

Over 80 percent of operations with 50 to 99 pigs permanently removed 10 or more pigs compared with about 33 percent of operations with 1 to 49 pigs. About one-fourth of operations with 1 to 49 pigs did not remove any pigs.

F.3.a. Percentage of operations by number of pigs permanently removed from this operation from June 1, 2011, to May 31, 2012, and by size of operation:

Number pigs permanently removed*	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	23.5	(2.0)	11.6	(4.2)	22.1	(1.8)
1	4.2	(0.9)	1.7	(1.7)	3.9	(0.9)
2-5	24.7	(2.0)	1.4	(1.3)	22.1	(1.8)
6-9	10.4	(1.4)	1.8	(1.7)	9.4	(1.3)
10 or more	37.2	(2.3)	83.5	(4.7)	42.5	(2.1)
Total	100.0		100.0		100.0	

A higher percentage of operations in the Central region permanently removed 10 or more pigs compared with operations in the other regions.

F.3.b. Percentage of operations by number of pigs permanently removed from the operation from June 1, 2011, to May 31, 2012, and by region:

Number pigs permanently removed	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	22.1	(3.0)	17.3	(4.2)	23.7	(2.8)
1	3.6	(1.3)	0.0	(—)	5.6	(1.5)
2–5	21.3	(2.8)	16.8	(4.1)	24.5	(2.8)
6–9	11.3	(2.3)	5.9	(2.6)	8.9	(1.9)
10 or more	41.8	(3.3)	59.9	(5.3)	37.4	(3.1)
Total	100.0		100.0		100.0	

*Sold for commercial slaughter, home slaughtered, or otherwise permanently removed (includes escapes).

Over one-third of operations with 50 to 99 pigs permanently removed sows or gilts for breeding purposes, compared with less than one-fifth of operations with 1 to 49 pigs. Similarly, 31.2 percent of operations with 50 to 99 pigs permanently removed culled breeding stock compared with 12.1 percent of operations with 1 to 49 pigs.

F.3.c. For operations that permanently removed pigs* from June 1, 2011, to May 31, 2012, percentage of operations by type of pigs removed and by size of operation:

Pig type	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows or gilts for breeding	19.5	(2.1)	34.1	(6.3)	21.4	(2.0)
Boars for breeding	10.1	(1.6)	11.2	(4.3)	10.3	(1.5)
Culled breeding stock (sows or boars)	12.1	(1.8)	31.2	(6.0)	14.6	(1.8)
Newly weaned pigs	13.3	(1.8)	16.4	(5.0)	13.7	(1.7)
Feeder pigs	29.1	(2.5)	33.5	(6.5)	29.7	(2.3)
Market weight slaughter pigs	59.2	(2.6)	74.5	(6.0)	61.2	(2.4)
Other	9.0	(1.6)	12.3	(4.4)	9.4	(1.5)

*Sold for commercial slaughter, home slaughtered, or otherwise permanently removed (includes escapes).

In the West/South region, 49.4 percent of operations permanently removed market-weight slaughter pigs compared with 70.6 percent of operations in the Northeast region and 71.0 percent in the Central region.

F.3.d. For operations that permanently removed pigs* from June 1, 2011, to May 31, 2012, percentage of operations by type of pigs removed and by region:

Pig type	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows or gilts for breeding	13.5	(2.8)	23.0	(4.8)	27.8	(3.4)
Boars for breeding	7.4	(2.1)	7.1	(3.1)	14.0	(2.6)
Culled breeding stock (sows or boars)	14.3	(2.8)	15.9	(4.2)	14.5	(2.7)
Newly weaned pigs	10.4	(2.5)	9.6	(3.6)	18.0	(2.9)
Feeder pigs	32.5	(3.8)	27.0	(5.5)	28.2	(3.4)
Market weight slaughter pigs	70.6	(3.7)	71.0	(5.6)	49.4	(3.7)
Other	6.7	(2.0)	4.9	(2.7)	13.4	(2.6)

*Sold for commercial slaughter or home slaughtered or otherwise permanently removed (includes escapes).

Overall, nearly half of pigs removed were market-weight slaughter pigs.

F.3.e. For operations that permanently removed pigs* from June 1, 2011, to May 31, 2012, percentage of pigs by type of pigs removed and by size of operation:

Pig type	Percent Pigs					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows or gilts for breeding	3.5	(0.9)	1.8	(0.5)	2.8	(0.6)
Boars for breeding	1.1	(0.3)	0.2	(0.1)	0.8	(0.2)
Culled breeding stock (sows or boars)	2.8	(0.6)	1.1	(0.3)	2.1	(0.4)
Newly weaned pigs	13.2	(3.1)	5.4	(2.7)	10.0	(2.2)
Feeder pigs	34.5	(6.6)	22.4	(7.2)	29.6	(5.2)
Market weight slaughter pigs	39.6	(5.5)	64.4	(8.9)	49.7	(5.4)
Other	5.3	(2.4)	4.7	(4.0)	5.1	(2.2)
Total	100.0		100.0		100.0	

*Sold for commercial slaughter or home slaughtered or otherwise permanently removed (includes escapes).

F.3.f. For operations that permanently removed pigs* from June 1, 2011, to May 31, 2012, percentage of pigs by type of pigs removed and by region:

Pig type	Percent Pigs					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Sows or gilts for breeding	1.9	(0.6)	3.6	(1.2)	3.1	(1.0)
Boars for breeding	0.3	(0.1)	1.2	(0.7)	0.9	(0.3)
Culled breeding stock (sows or boars)	2.5	(0.8)	1.6	(0.6)	2.0	(0.6)
Newly weaned pigs	7.3	(2.8)	6.0	(2.9)	13.8	(4.2)
Feeder pigs	35.9	(7.8)	19.7	(6.7)	28.8	(8.8)
Market weight slaughter pigs	51.0	(7.6)	66.5	(8.2)	41.5	(9.6)
Other	1.0	(0.4)	1.4	(1.1)	9.8	(4.7)
Total	100.0		100.0		100.0	

*Sold for commercial slaughter or home slaughtered or otherwise permanently removed (includes escapes).

4. Destination of pigs permanently removed from operation

Nearly half of operations with 1 to 49 pigs slaughtered pigs for home consumption, compared with about one-fourth of operations with 50 to 99 pigs. A higher percentage of operations with 50 to 99 pigs (65.7 percent) sent pigs to commercial slaughter than operations with 1 to 49 pigs (27.4 percent).

F.4.a. For operations that permanently removed pigs from June 1, 2011, to May 31, 2012, percentage of operations by destination of pigs removed and by size of operation:

Destination	Percent Operations					
	Size of Operation (number head)					
	1-49		50-99		All operations	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Directly to other premises	23.7	(2.3)	26.1	(6.0)	24.0	(2.2)
Directly to commercial slaughter	27.4	(2.4)	65.7	(6.6)	32.3	(2.3)
Directly to custom slaughter for someone else	20.4	(2.2)	15.4	(5.2)	19.8	(2.0)
Slaughtered for home consumption	46.7	(2.7)	27.1	(5.9)	44.3	(2.5)
Sold via an auction or dealer	17.8	(2.1)	18.4	(5.6)	17.9	(1.9)
Sold at a fair or show	13.3	(1.8)	12.9	(4.6)	13.2	(1.7)
Escaped	0.6	(0.4)	2.6	(2.6)	0.8	(0.5)

A higher percentage of operations in the Northeast and Central regions (41.3 and 39.6 percent, respectively) sent pigs to commercial slaughter than operations in the West/South region (21.7 percent).

F.4.b. For operations that permanently removed pigs from June 1, 2011, to May 31, 2012, percentage of operations by destination of pigs removed and by region:

Destination	Percent Operations					
	Region					
	Northeast		Central		West/South	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Directly to other premises	22.6	(3.4)	23.5	(5.3)	25.5	(3.3)
Directly to commercial slaughter	41.3	(3.8)	39.6	(6.2)	21.7	(3.0)
Directly to custom slaughter for someone else	20.0	(3.2)	27.3	(5.7)	16.9	(2.8)
Slaughtered for home consumption	46.2	(4.0)	41.4	(6.0)	43.6	(3.7)
Sold via an auction or dealer	16.7	(3.0)	15.9	(4.5)	19.6	(3.0)
Sold at a fair or show	12.5	(2.7)	4.5	(2.5)	17.0	(2.9)
Escaped	0.0	(--)	2.0	(2.0)	1.1	(0.8)

Over half of newly weaned pigs that were permanently removed went to another premise, presumably to be raised to market weight.

F.4.c. For operations that permanently removed pigs from June 1, 2011, to May 31, 2012, percentage of pigs by destination of pigs and type of pig removed:

Destination	Percent Pigs							
	Pig Type							
	Sows or gilts for breeding		Boars for breeding		Culled breeding stock		Newly weaned pigs	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	
Directly to other premises	32.0	(10.5)	23.5	(10.9)	6.1	(3.4)	54.6	(11.5)
Directly to commercial slaughter	33.3	(8.9)	46.3	(13.0)	45.8	(15.5)	17.0	(8.3)
Directly to custom slaughter for someone else	14.8	(7.1)	10.6	(6.7)	8.5	(4.5)	2.2	(1.6)
Slaughtered for home consumption	4.9	(1.8)	4.2	(2.6)	5.3	(2.4)	2.4	(1.2)
Sold via an auction or dealer	9.5	(3.6)	15.5	(8.5)	31.0	(10.4)	18.1	(8.9)
Sold at a fair or show	3.4	(2.2)	0.0	(—)	0.0	(—)	5.8	(4.6)
Escaped	2.0	(2.0)	0.0	(—)	3.2	(3.2)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

F.4.c. For operations that permanently removed pigs from June 1, 2011, to May 31, 2012, percentage of pigs by destination of pigs and type of pig removed: (cont'd.)

Destination	Percent Pigs							
	Pig Type							
	Feeder pigs		Market weight slaughter pigs		Other		All pig types	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Directly to other premises	34.3	(9.9)	18.3	(11.7)	8.1	(6.5)	25.4	(6.5)
Directly to commercial slaughter	8.7	(4.0)	54.2	(8.9)	6.0	(6.3)	35.4	(5.3)
Sold directly to custom slaughter for someone else	5.3	(2.8)	10.0	(2.6)	1.0	(1.0)	7.6	(1.7)
Slaughtered for home consumption	3.4	(1.1)	6.7	(1.9)	0.2	(0.2)	5.0	(1.1)
Sold via an auction or dealer	37.7	(13.0)	9.6	(3.4)	0.2	(0.2)	18.0	(5.1)
Sold at a fair or show	7.2	(6.3)	1.3	(0.5)	84.5	(10.6)	7.6	(3.1)
Escaped	3.5	(3.4)	0.0	(0.0)	0.0	(—)	1.1	(1.1)
Total	100.0		100.0		100.0		100.0	

5. Pigs that left the operation and returned

Most operations did not transport any pigs off the operation and then return them from June 1, 2011, to May 31, 2012, regardless of size or region.

F.5.a. Percentage of operations by number of times any pigs were transported off the operation and returned from June 1, 2011, to May 31, 2012, and by size of operation:

Percent Operations						
Size of Operation (number head)						
	1-49		50-99		All operations	
Number times	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	81.4	(1.8)	84.0	(4.6)	81.7	(1.7)
1	5.4	(1.1)	8.0	(3.4)	5.7	(1.0)
2	2.9	(0.8)	1.1	(1.1)	2.7	(0.7)
3 or more	10.4	(1.4)	6.9	(3.3)	10.0	(1.3)
Total	100.0		100.0		100.0	

F.5.b. Percentage of operations by number of times any pigs were transported off the operation and returned from June 1, 2011, to May 31, 2012, by region:

Percent Operations						
Region						
	Northeast		Central		West/South	
Number times	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
0	85.2	(2.5)	82.2	(4.1)	78.5	(2.6)
1	6.1	(1.7)	10.4	(3.2)	3.8	(1.2)
2	2.6	(1.1)	3.7	(2.1)	2.4	(1.0)
3 or more	6.1	(1.7)	3.6	(2.1)	15.2	(2.3)
Total	100.0		100.0		100.0	

For operations that transported pigs off the operation and returned them, the average number of times pigs were moved and returned did not differ by size of operation.

F.5.c. For operations that transported any pigs off the operation and returned them, average number of times pigs were transported and returned from June 1, 2011, to May 31, 2012, by size of operation:

Average Number of Times					
Size of Operation (number head)					
1-49		50-99		All operations	
Average	Std. error	Average	Std. error	Average	Std. error
6.2	(1.6)	8.7	(5.0)	6.4	(1.5)

Operations in the Central region transported pigs off the operation and returned them fewer times on average than operations in the West/South region.

F.5.d. For operations that transported any pigs off the operation and returned them, average number of times pigs were transported and returned from June 1, 2011, to May 31, 2012, by region:

Average Number of Times					
Region					
Northeast		Central		West/South	
Average	Std. error	Average	Std. error	Average	Std. error
6.2	(2.1)	2.0	(0.4)	7.8	(2.5)

Section II: Methodology

A. Needs Assessment

NAHMS develops study objectives by exploring existing literature and contacting industry members about their informational needs and priorities during a needs assessment phase. The needs assessment for the 2012 Swine study primarily focused on developing questionnaires and biological collections involving producers with 100 or more pigs. The needs assessment phase began September 2010 and ended when the objectives of the overall study were released in August 2011. This phase consisted of gathering input from multiple industry leaders, stakeholders within government and academia, and through an online survey. The results from these efforts culminated in the following study objectives:

1. Describe current U.S. swine production practices including general management practices, housing practices, productivity, disease prevention, and mortality for five phases of production: gestation, farrowing, nursery, grow/finish, and wean-to-finish.
2. Describe trends in swine health and management practices.
3. Determine the prevalence and associated risk factors for select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in weaned market pigs.
4. Describe antibiotic usage patterns in pigs postweaning to market to control and treat disease and promote growth.
5. Evaluate presence of or exposure to select pathogens and characterize isolated organisms from biological specimens (feces, sera, feed).
6. Update estimates of the economic cost of select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in commercial swine herds and create estimates of the economic cost of different treatment approaches.

The needs assessment had an impact on the part of the study that involved producers with fewer than 100 pigs. In particular, objectives 1 and 2 were pursued with operations with fewer than 100 pigs on-site via a Caller Assisted Telephone Interview (CATI) questionnaire. Additionally, it was desirable to update estimates from the NAHMS Small-enterprise Swine 2007 study. Accordingly, the fewer- than-100 pigs survey instrument was similar between study years.

B. Sampling and Estimation

1. State selection

A goal for NAHMS national studies is to include States that account for at least 70 percent of animal and producer populations in the United States. The 31 States identified in the NAHMS Small-enterprise Swine 2007 study were used again in this study, primarily for validity of follow-up estimates to the previous study and/or they were already part of the 100-plus pigs aspect of the current study. These States represented 82.7 percent of swine operations with fewer than 100 pigs and 86.9 percent of the pigs on operations with fewer than 100 pigs in the United States, according to the 2007 Census of Agriculture. The 31 States were Alabama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Washington, and Wisconsin.

2. Operation selection

It was estimated that a total sample of 2,000 operations would yield the desired number of completed questionnaires. The 2,000 samples were allocated to State/size strata in proportion to the hog inventory and number of operations in each stratum. Within each State/size stratum a simple random sample was chosen. The sample was chosen by NASS from a sampling frame based on the most current available information (as of April 2012) in order to minimize the number of out-of-business and zero-inventory operations.

3. Population inferences

Inferences cover the population of swine operations with 1 to 99 pigs in the 31 participating States as of April 2012. As of December 31, 2007 (2007 Census of Agriculture), these States accounted for 82.7 percent of operations with fewer than 100 pigs and 86.9 percent of the U.S. pig inventory on operations with fewer than 100 pigs. (See appendix II for respective data on individual States.) All respondent data were statistically weighted to reflect the population from which they were selected. The inverse of the probability of selection for each operation was the initial selection weight. This selection weight was adjusted for nonresponse within each State/size stratum to allow for inferences back to the original population from which the sample was selected.

**C. Data
Collection****1. General Swine Farm Questionnaire (GSFQ)**

Telephone interviews were conducted via computer-assisted telephone interview software at each individual State NASS office. All data were collected from July 1 to August 15, 2012. Producers with fewer than 100 pigs were contacted via NASS telephone enumerators, who administered the questionnaire, which took an average of 30 minutes to complete.

D. Data Analysis**1. Validation and estimation**

NASS performed initial data entry and validation using BLAISE software. Data from CATI administration was entered into a SAS data set, and the edit and validation programs were executed. NAHMS staff performed additional data validation on the entire data set after data from all States were combined and then used SUDAAN to complete the statistical estimation. SUDAAN uses a Taylor series expansion to estimate appropriate variances for the stratified/clustered, weighted data.

E. Sample Evaluation

1. General Swine Farm Questionnaire

The purpose of this section is to provide various performance measurement parameters. Historically, the term “response rate” was used as a catchall parameter, but there are many ways to define and calculate response rates. Therefore, the table below presents an evaluation based upon a number of measurement parameters, which are defined with an “x” in those categories that contribute to the measurement. Of the 2,002 operations eligible for the GSFQ, 1,312 (65.5 percent) provided usable inventory information. There were 539 operations, or 26.9 percent of the sample, that provided “complete” information for the questionnaire.

Response category	Number operations	Percent operations	Measurement parameters		
			Contacts	Usable ¹	Complete ²
Completed GSFQ	539	26.9	x	x	x
No pigs or pigs between June 1, 2011, and May 31, 2012	773	38.6	x	x	
Refused GSFQ	102	5.1	x		
Inaccessible	581	29.0			
Office hold (NASS elects not to contact)	7	0.4			
Total	2,002	100.0	1,414	1,312	539
Percent of total operations			70.6	65.5	26.9
Percent of total operations weighted ³			70.7	65.6	26.4

¹Usable operation = respondent provided answers to inventory questions for the operation (either zero or positive number on hand June 1, 2011, through May 31, 2012).

²Survey complete operation = respondent provided answers to all or nearly all questions.

³Weighted response = the rate was calculated using the selection weights.

Appendix I: Sample Profile

A. Responding Operations

1. Number of responding operations by total inventory

Size of operation (total inventory on June 1)	Number of responding operations
Missing information	78
0*	2
1–10	236
11–24	76
25–49	68
50 or more	79
Total	539

*Reported zero pigs on June 1, 2012, but completed the questionnaire.

2. Number of responding operations by region

Region	Number of responding operations
Northeast	214
Central	83
West and South	242
Total	539

3. Sow inventory

Size of operation (total sows and gilts on June 1)	Number of responding operations
Missing information	78
0	145
1–3	118
4–9	105
10 or more	93
Total	539

4. Weaned pig inventory

Size of operation (total weaned pigs on June 1)	Number of responding operations
Missing information	78
0	151
1–5	130
6–12	65
13 or more	115
Total	539

Appendix II: U.S. Swine Inventory and Number of Farms

Region	State	Number of hogs and pigs		Number of farms	
		All farms	Farms with 1–99 head	All farms	Farms with 1–99 head
Northeast	Illinois	4,298,716	25,219	2,864	1,203
	Indiana	3,669,057	31,903	3,420	1,839
	Michigan	1,032,054	28,199	2,691	2,138
	New Jersey	8,551	(D)	271	254
	New York	85,741	17,468	1,871	1,810
	Ohio	1,831,084	34,112	3,718	2,686
	Pennsylvania	1,167,449	31,487	3,637	2,907
	Wisconsin	436,814	39,300	3,188	2,698
	Total	12,529,466	NA	21,660	15,535
Central	Iowa	19,295,092	38,935	8,330	1,365
	Kansas	1,885,252	18,224	1,454	988
	Minnesota	7,652,284	28,886	4,382	1,490
	Missouri	3,101,469	33,955	2,999	2,034
	Nebraska	3,268,544	17,765	2,213	696
	South Dakota	1,490,034	9,355	959	377
	Total	36,692,675	147,120	20,337	6,950
West	Arizona	(D)	2,479	378	369
	California	153,983	11,635	1,389	1,332
	Colorado	882,695	10,184	1,171	1,106
	Hawaii	14,933	(D)	225	196
	New Mexico	1,972	(D)	395	394
	Washington	28,545	10,899	1,463	1,439
	Total	NA	NA	5,021	4,836
South	Alabama	178,275	(D)	753	693
	Arkansas	289,342	9,017	1,142	995
	Florida	19,937	13,289	1,906	1,881
	Georgia	263,471	9,401	1,111	1,008
	Louisiana	10,615	7,207	718	701
	Mississippi	337,244	5,424	683	622
	North Carolina	10,134,004	(D)	2,836	1,095
	Oklahoma	2,398,372	22,720	2,702	2,551
	South Carolina	293,793	6,754	812	729
	Tennessee	138,207	15,495	1,566	1,469
	Texas	1,155,790	31,759	4,471	4,369
Total	15,219,050	NA	18,700	16,113	
Total (31 States)		NA	NA	65,718	43,434
Total U.S.(50 States)		67,786,318	622,032	75,442	52,521

Source: NASS 2007 Census of Agriculture.

D = Number not published.

Appendix III: Study Objectives and Related Outputs

1. Described current U.S. swine production practices including general management practices, housing practices, productivity, disease prevention, and mortality for five phases of production: gestation, farrowing, nursery, grow/finish, and wean-to-finish
 - Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012, February 2014
 - Part I: Baseline Reference of Swine Health and Management, expected summer 2014
 - Part II: Reference of Swine Health and Health Management in the United States, 2012, expected fall 2014
 - Breeding Herd Performance (small-enterprise operations), info sheet
 - Biosecurity (small-enterprise operations), info sheet
 - Disease Levels (small-enterprise operations), info sheet
 - External Biosecurity, info sheet
 - Fecal Management, info sheet
 - Grain Particle Size, info sheet
 - Internal Biosecurity Risk, info sheet
 - Sow Gestation Housing, info sheet
 - Sow Productivity, info sheet
 - Wean-to-Finish Production, info sheet
2. Describe trends in swine health and management practices
 - Part III: Changes in the U.S. Pork Industry, 1995–2012, expected fall 2014
 - Breeding Herd Performance (small-enterprise operations), info sheet
 - Sow Gestation Housing, info sheet
 - Sow Productivity, info sheet
3. Determine the prevalence and associated risk factors for select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in weaned market pigs
 - PRRS Control in Breeding Herds, info sheet
 - PRRS Relevance, info sheet
 - Toxoplasma, info sheet
 - Trichinae, info sheet
4. Describe antibiotic usage patterns in pigs postweaning to market to control and treat disease and promote growth
 - Antibiotic Use, info sheet

5. Evaluate presence of or exposure to select pathogens and characterize isolated organisms from biological specimens (feces, sera, feed)
 - *Enterococcus*, info sheet
 - Generic *E. coli*, info sheet
 - PRRS Relevance, info sheet
 - *Salmonella*, info sheet
 - Toxoplasma, info sheet
 - Trichinae, info sheet
6. Update estimates of the economic cost of select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in commercial swine herds and create estimates of the economic cost of different treatment approaches
 - Swine Dysentery, info sheet

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