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Veterinary Services

National Animal Health Monitoring System

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Swine 2012

Part III: Changes in the U.S. Swine Industry, 1995–2012

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Items of Note

Study population

The number of U.S. swine sites decreased from 168,450 sites in 1995 to 68,300 in 2012. During those same years, a large decline occurred in the number of traditional swine operations that managed all production stages on one site (i.e., farrow-to-finish operations).

Breeding herd management

Reasons for culling older breeding animals did not substantially change from 1995 to 2012. A lower percentage of sites in 2012 than in 1995 never isolated new breeding males, while a higher percentage in 2012 than in the previous study years did not introduce breeding males.

Housing

The percentage of farrowing sites that housed pigs in an open building with outside access decreased from 1995 to 2012. From 2006 to 2012, the percentage of sites that housed gestating animals in an open building with no outside access increased, suggesting a move toward more naturally ventilated systems for gestating pigs. Pit-holding was the waste-management method used by the highest percentage of sites with gestating, nursery, or grower/finisher pigs in 2012.

Disease and health

The percentage of sites reporting porcine reproductive and respiratory syndrome or influenza in breeding females or weaned pigs increased from 2000 to 2012. The percentage of sites reporting porcine circovirus associated disease in grower/finisher pigs decreased from 2006 to 2012, perhaps because during the previous 8 years weaned pigs have been vaccinated against PCV2.

The 2012 study marked the first time that transmissible gastroenteritis was not reported as a problem in preweaned pigs on any sites. This finding has a degree of irony, considering the similar coronavirus that arrived in the United States only a year later.

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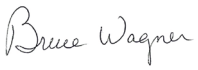
Acknowledgments

This report was a cooperative effort between two U.S. Department of Agriculture (USDA) agencies: the National Agricultural Statistics Service (NASS) and the Animal and Plant Health Inspection Service (APHIS).

We would like to thank the NASS enumerators who contacted swine producers and collected the data. We would also like to thank the personnel at the USDA–APHIS–Veterinary Services' Center for Epidemiology and Animal Health for their efforts in designing the study, developing the questionnaires, and generating and distributing this report.

All participants are to be commended, particularly the swine producers whose voluntary efforts made the Swine 2012 study possible.



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Feedback
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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, members could identify opportunities for improvement, provide foundations for research and special studies, and detect emerging problems.

Section I of this report presents demographic changes of the U.S. and world pork industries from a historical perspective using data provided by the Foreign Agricultural Service and the National Agricultural Statistics Service (NASS). Results of past NAHMS national studies in sections II and III of this report provide an overview of changes in U.S. swine management, productivity, and health.

The 1990 National Swine Survey was NAHMS' first national study of the U.S. swine industry and provided a snapshot of animal health and management that would serve as a baseline from which to measure industry changes. NAHMS conducted the 1990 National Swine Survey in 18 States, with a target population of operations with at least 1 sow. These States represented 95 percent of the U.S. swine population. National estimates generated from this study are reported in "Preweaning Morbidity & Mortality" (January 1992).

Swine '95 was conducted in 16 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 reported in "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 phase of the study are reported in "Part II: Reference of 1995 Grower/Finisher Health and Management" (May 1996).

Swine 2000 was designed to provide participants and the industry with information on U.S. swine herds with 100 or more pigs. NASS collaborated with USDA's Veterinary Services to select a producer sample statistically designed to provide inferences to the Nation's swine populations on operations with 100 or more pigs. Included in the study were 17 of the major pork producing States, which represented 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 reported 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" (April 2005).

Swine 2006 used a study design similar to that used for the Swine 2000 study. Seventeen States participated in the Swine 2006 study, representing 94 percent of U.S. swine operations and inventory on operations with 100 or more pigs. The Swine 2006 sample referred to the population of operations with 100 or more pigs in 17 States. Results from this study are reported 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 on operations with fewer than 100 pigs. The study covered States that had participated in previous national swine studies, plus States considered at risk for exposure to feral swine and the transmission of classical swine fever and pseudorabies. Thirty-one States participated in the study. These States represented 88.3 percent of U.S. swine and 84.4 percent of operations with fewer than 100 pigs, according to the 2002 Census of Agriculture.

Swine 2012 comprised two concurrent studies. The core study targeted operations with 100 or more pigs in 13 States (see map on following page). A random sample of 4,600 operations was selected to participate in phase I of the study. There were two versions of the phase I questionnaire administered from July 16 through August 15, 2012. The full version was completed during on-farm interviews and a shorter version was administered via computer-assisted telephone interviews. Producers that completed phase I, either by phone or interview, were asked to continue with phase II of the study. The questionnaire used in phase II was administered by State and Federal veterinary medical officers (VMOs) from September 5 through November 17, 2012. Phase II respondents also had the opportunity to participate in the collection of feed, feces, or blood for diagnostic testing and analysis. This report presents results from phase II of the study.

The Small-Enterprise Swine study was conducted concurrently with the core NAHMS Swine 2012 study. This study targeted operations with fewer than 100 pigs in 31 selected States. A random sample of 2,000 operations was selected for participation from July 17 through September 15, 2012. NASS mailed the study questionnaire and then followed up with nonrespondents via computer-assisted telephone interviews. Results from the 2012 small-enterprise swine study are presented in "Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012" (February 2014).

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

Terms Used in This Report

All in, all out: A management approach in which animals are moved as a group, allowing a facility to be completely empty for a period of time. Usually, all-in, all-out management consists of completely cleaning and disinfecting the facility before refilling it with animals. All-in, all-out management can be done at any group level: pen area, room, building, or entire facility.

Average:

> **Operation average:** A single value for each operation summed over all operations reporting divided by the number of operations reporting (see average number of days quarantine, p 28).
>
> **Pig-level average:** A single operation value multiplied by the number of animals on the operation; then values are summed across operations and divided by total number of animals on all operations (see average age at weaning, p 35).

Breeding pigs: All gilts, sows, and boars used for breeding.

Cull: The action of removing animals from the herd or slating them for removal for a reason usually related to poor performance, e.g., sows no longer suitable for breeding.

Continuous flow: A management approach in which animals are not moved as a group and, therefore, pens, rooms, or buildings always contain some animals.

Danish entry: A biosecurity measure in which the primary room used for entering the pig production area is divided into two sides (“dirty” and “clean”) by a solid barrier. Both sides have areas for storing separate clothing and footwear as well facilities and/or supplies for cleaning hands. Upon arrival, people enter the dirty side first. Outer clothing and footwear are removed and stored on the dirty side. Hands are cleaned using soap and water or by using hand sanitizer. People leave the dirty side and enter the clean side in their stocking feet, where they dress in coveralls and barn boots. Only then can they enter the production area. The process is reversed when leaving the production area.

Feedback: Pigs are fed a biologic material potentially containing a pathogen to boost immunity against the pathogen.

Gestation: Period from conception to birth, about 114 days in pigs. Gilts and sows in this stage are often called gestating females.

Grower/finisher: Production phase in which pigs are fed-out from approximately 60 pounds to final market weight for slaughter, at which point they go to market or may be selected as breeding animals.

Hand-mating: Term used when females are selected individually to be bred with a specific boar. Both sow and boar are placed in the same pen, and a stockperson might have to help with the physical aspects of mating.

Mummy: A dry, shriveled stillborn pig, often black in color. Mummies are sometimes caused by an infection in the sow during gestation.

Nursery: Production phase in which newly weaned pigs are managed, fed, and housed to weights of approximately 60 pounds, at which point they are put into a grower/finisher unit.

Open building with no outside access: Any building for housing swine that is open on one or more sides all year (natural ventilation). The open sides of the building might have a curtain.

Open building with outside access: Any building that allows access to an outside area (e.g., an uncovered pen).

Operation: The overall business and top-level management unit for a swine-rearing facility, which might consist of one or more sites. An operation can encompass all production phases of swine rearing (i.e., gestation, farrowing, nursery, and grower/finisher) on one or more sites (geographic locations), each devoted to a different production phase or combination of phases. (See also “Site.”)

Pen-mating: One or more boars are introduced to female pigs in a pen or other enclosure for natural breeding.

Percent animals: The number of animals on sites with a certain attribute divided by the total number of animals on all sites. In some cases, it is assumed that the attribute applies to all animals on the site. The animal type is defined in each table and may include total inventory, sow inventory, number of pigs that entered the nursery, or other specific pig groups. The “percent animals” estimates primarily reflect larger sites, which have the majority of pigs.

Percent sites: The number of sites with a certain attribute divided by the total number of sites. Percentages will sum to 100 where the attributes are mutually exclusive, but will not sum to 100 when the attributes are not mutually exclusive. The “percent sites” estimates primarily reflect smaller sites, since they make up the majority of operations.

Pit-holding: A waste management system in which manure is stored in a pit, usually under the floor of a facility containing pigs.

Population estimates: Estimates in this report are provided with a measure of precision called the standard error. A 95-percent confidence interval can be created 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 as (0.0). If there were no reports of the event, no standard error was reported (—).

Rendering: A process that converts animal-tissue waste into useful byproducts such as meat and bone meal.

Scours: Diarrhea.

Site: One geographic location or address that functions as a unit to produce one or more production phases in swine rearing. An example would be a gestation/farrowing site. A site can encompass more than one production phase, such as a farrow-to-finish, which has gestation, farrowing, nursery, and grower/finisher pigs at one location. A site can be a part of an operation or it can be the whole operation, if the operation has only one site. (See also “Operation.”)

Total confinement: Raising pigs inside a building with mechanical ventilation and no outside access.

Wean-to-finish: Production phase in which newly weaned pigs are managed, fed, and housed until they go to market or are selected as breeding animals.

Weaning: When baby pigs are transitioned from nursing their mother to eating feed.

Section I: Demographic Changes in the U.S. and World Pork Industries, 1850–2012

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

A. Historical Changes in the U.S. Swine Industry, 1850–2012

1. Total pig inventory

The NASS Census of Agriculture has collected hog and pig inventory numbers at 5-year intervals since 1850. A relatively stable inventory was seen from 1890 through 1930, at about 60 million head. By 1940, inventory had declined 40 percent, only to rebound by 1950. Hog and pig inventory peaked in 1959 at nearly 68 million head. Estimates in subsequent years consistently remained near 55 million head, increasing to 60 million head in 2002. The number of hog sites declined dramatically starting in 1959. The 2007 Census of Agriculture showed the number of sites at 2.5 percent of those in 1950, while the number of head increased. As a result, the average herd size increased from fewer than 20 head in 1950 to nearly 900 head in 2007.

A.1.a. Changes in December 1 U.S. hog and pig inventory, and average herd size, 1850–2012:

Year*	Total inventory (1,000 head)	Sites reporting	Average herd size
1850	30,354	NA	NA
1860	33,513	NA	NA
1870	25,135	NA	NA
1880	49,773	NA	NA
1890	57,427	NA	NA
1900	62,868	4,335,363	15
1910	58,186	4,351,751	13
1920	59,346	4,850,807	12
1930	56,288	3,535,119	16
1940	34,037	3,766,675	9
1950	55,789	3,013,549	19
1959	67,949	1,848,784	37
1969	55,455	686,097	81
1978	57,697	445,117	130
1987	52,271	243,398	215
1992	57,563	191,347	301
1997	61,188	124,889	490
2002	60,405	78,895	766
2007	67,786	75,442	899
2012	66,027	63,246	1,044

*NASS Census of Agriculture data. 1850–1950 includes all States except Alaska and Hawaii. 1959–2012 includes all 50 States.

Each year, NASS surveys a random sample of producers to provide national estimates of animal populations and food production. The table below reports NASS demographics of the U.S. pork industry published on December 1 of each year.

From 1990 through 2012, hog and pig inventory estimates increased 21.7 percent. Breeding inventory made up 12.6 percent of total inventory in 1990 compared with 10.6 percent in 2000 and 8.8 percent in 2012, indicating a more productive breeding herd.

A.1.b. Changes in U.S. hog and pig and breeding inventories, December 1, 1990–2012:*

	Hogs and Pigs					Breeding Inventory				
Year	1,000 head	Pct. previous year	Pct. 1990	Pct. 1995	Pct. 2000	1,000 head	Pct. previous year	Pct. 1990	Pct. 1995	Pct. 2000
1990	54,416	101.2	100.0	—	—	6,847	99.9	100.0	—	—
1991	57,649	105.9	105.9	—	—	7,229	105.6	105.6	—	—
1992	58,202	101.0	107.0	—	—	7,109	98.3	103.8	—	—
1993	57,940	99.5	106.5	—	—	7,166	100.8	104.7	—	—
1994	59,738	103.1	109.8	—	—	6,998	97.7	102.2	—	—
1995	58,201	97.4	107.0	100.0	—	6,770	96.7	98.9	100.0	—
1996	56,124	96.4	103.1	96.4	—	6,578	97.2	96.1	97.2	—
1997	61,158	109.0	112.4	105.1	—	6,957	105.8	101.6	102.8	—
1998	62,204	101.7	114.3	106.9	—	6,682	96.0	97.6	98.7	—
1999	59,335	95.4	109.0	101.9	—	6,233	93.3	91.0	92.1	—
2000	59,110	99.6	108.6	101.6	100.0	6,267	100.5	91.5	92.6	100.0
2001	59,722	101.0	109.8	102.6	101.0	6,201	98.9	90.6	91.6	98.9
2002	59,554	99.7	109.4	102.3	100.8	6,058	97.7	88.5	89.5	96.7
2003	60,453	101.5	111.1	103.9	102.3	6,019	99.4	87.9	88.9	96.0
2004	60,982	100.9	112.1	104.8	103.2	5,980	99.4	87.3	88.3	95.4
2005	61,463	100.8	113.0	105.6	104.0	6,031	100.8	88.1	89.1	96.2
2006	62,516	101.7	114.9	107.4	105.8	6,116	101.4	88.3	90.3	97.6
2007	68,177	109.1	125.3	117.1	115.3	6,233	101.9	91.0	92.1	99.5
2008	67,048	98.3	123.2	115.2	113.4	6,062	97.3	88.5	89.5	96.7
2009	64,687	96.5	118.9	111.1	109.4	5,850	96.5	85.4	86.4	93.3
2010	64,725	100.1	118.9	111.2	109.5	5,778	98.8	84.4	85.3	92.2
2011	66,259	102.4	121.8	113.8	112.1	5,803	100.4	84.8	85.7	92.6
2012	66,224	99.4	121.7	113.8	112.0	5,819	100.3	85.0	86.0	92.9

*Source: National Agricultural Statistics Service (NASS).

2. Number of swine sites and herd size

The number of swine sites has steadily decreased since 1990. By 2006, the number of swine sites had decreased to less than one-fourth the number reported in 1990.

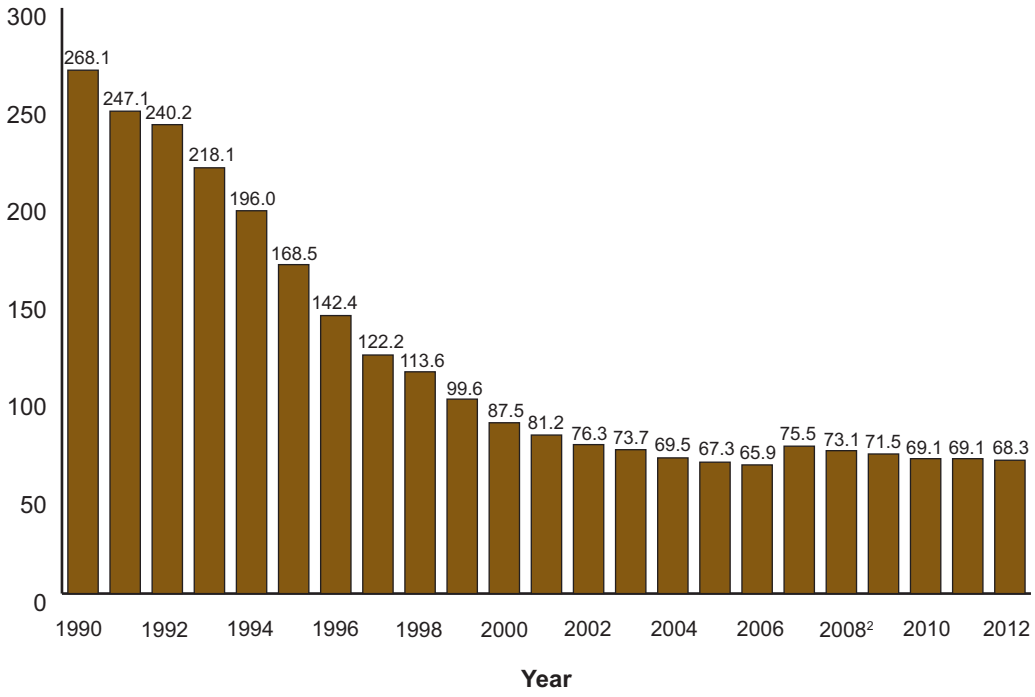
A.2.a. Changes in the number of U.S. swine sites, 1990–2012:[1]

Year	Number of sites	Pct. previous year	Pct. 1990	Pct. 1995	Pct. 2000
1990	268,140	89.1	100.0		
1991	247,090	92.1	92.1		
1992	240,150	97.2	89.6		
1993	218,060	90.8	81.3		
1994	196,030	89.9	73.1		
1995	168,450	85.9	62.8	100.0	
1996	142,380	84.5	53.1	84.5	
1997	122,160	85.8	45.6	72.5	
1998	113,590	93.0	42.4	67.4	
1999	99,620	87.7	37.2	59.1	
2000	87,470	87.8	32.6	51.9	100.0
2001	81,220	92.9	30.3	48.2	92.9
2002	76,250	93.9	28.4	45.3	87.2
2003	73,720	96.7	27.5	43.8	84.3
2004	69,500	94.3	25.9	41.3	79.5
2005	67,280	96.8	25.1	39.9	76.9
2006	65,940	98.0	24.6	39.1	75.4
2007[2]	75,450	114.4	28.1	44.8	86.3
2008	73,150	97.0	27.3	43.4	83.6
2009	71,450	97.7	26.6	42.4	81.7
2010	69,100	96.7	25.8	41.0	79.0
2011	69,100	100.0	25.8	41.0	79.0
2012	68,300	98.8	25.5	40.5	78.1

[1]Source: NASS.

[2]Beginning in 2007, NASS changed the definition of hog and pig operations, which likely accounts for the increase in the number of sites.

Number of swine sites, 1990–2012[1]



[1]Source: NASS.

[2]Beginning in 2007, NASS changed the definition of hog and pig operations, which likely accounts for the increase in the number of sites.

Sites with fewer than 100 pigs represented the majority of pig sites. The percentages of sites with 100 to 499 pigs and with 500 to 999 pigs has decreased since 1998. The percentage of sites with a total inventory of 2,000 or more pigs increased from 2.1 percent in 1993 to 13.1 percent in 2012.

A.2.b. Percentage of U.S. pig sites by herd size, 1990–2011:[1]

	Percent Sites						
	Herd Size (number head)						
Year	**1–99**	**100–499**	**500–999**	**1,000–1,999**	**2,000–4,999**	**5,000 or more**	**Total**
1990	63.9	25.0	7.1	4.0	[2]	[2]	100.0
1991	61.4	26.4	7.8	4.4	[2]	[2]	100.0
1992	60.2	26.5	8.1	5.2	[2]	[2]	100.0
1993	60.1	25.8	8.4	3.6	1.6	0.5	100.0
1994	58.6	25.9	8.8	4.2	1.9	0.6	100.0
1995	57.4	26.2	9.0	4.4	2.2	0.8	100.0
1996	57.5	25.0	9.1	4.8	2.5	1.1	100.0
1997	56.9	23.0	9.5	5.5	3.6	1.5	100.0
1998	54.4	23.8	9.9	6.0	4.2	1.7	100.0
1999	54.2	22.8	9.2	6.6	5.1	2.1	100.0
2000	57.3	19.3	8.7	6.7	5.6	2.4	100.0
2001	58.8	17.6	8.3	6.5	6.1	2.7	100.0
2002	59.8	16.1	8.2	6.6	6.3	3.0	100.0
2003	60.3	15.7	7.7	6.6	6.6	3.1	100.0
2004	60.6	14.9	7.4	6.4	7.4	3.3	100.0
2005	60.3	15.0	7.1	6.3	7.8	3.5	100.0
2006	60.5	14.6	6.8	6.4	8.0	3.7	100.0
2007	69.5	9.4	4.8	5.6	7.2	3.4	100.0
2008	69.3	9.2	4.8	5.4	7.3	4.0	100.0
2009	70.5	8.5	4.5	5.0	7.3	4.1	100.0
2010	70.9	7.5	4.1	5.3	7.7	4.5	100.0
2011	71.5	7.4	3.5	4.9	8.0	4.8	100.0
2012	71.3	7.3	3.4	4.8	8.3	4.8	100.0

[1]Source: NASS.
[2]Only estimates of 1,000 or more head were available in 1990–92.

The percentage of pig inventory on sites with 1 to 999 head has decreased steadily since 1990. As of 2012, only 5.3 percent of all pigs were on sites of this size. Conversely, the percentage of pig inventory on sites with 2,000 or more head has increased since 1993. As of 2012, 87.4 percent of all pigs were on sites of this size.

A.2.c. Percentage of U.S. total hog and pig inventory by herd size, 1990–2011:[1]

	Percent Total Hog and Pig Inventory						
	Herd Size (number of head)						
Year	**1–99**	**100–499**	**500–999**	**1,000–1,999**	**2,000–4,999**	**5,000 or more**	**Total**
1990	6.4	28.6	23.8	41.2	[2]	[2]	100.0
1991	5.5	27.2	23.4	43.9	[2]	[2]	100.0
1992	5.3	25.3	22.0	47.4	[2]	[2]	100.0
1993	5.0	22.5	21.5	17.5	15.5	18.0	100.0
1994	4.0	20.5	19.5	18.0	17.0	21.0	100.0
1995	3.5	18.0	17.0	17.0	17.0	27.5	100.0
1996	3.0	15.0	15.0	16.0	17.0	34.0	100.0
1997	2.0	11.0	12.0	14.5	20.5	40.0	100.0
1998	2.0	9.5	11.0	14.0	21.5	42.0	100.0
1999	1.5	8.0	9.0	13.0	22.5	46.0	100.0
2000	1.0	6.5	8.0	12.5	22.0	50.0	100.0
2001	1.0	5.5	7.5	12.0	23.0	51.0	100.0
2002	1.0	5.0	6.5	12.0	22.5	53.0	100.0
2003	1.2	4.6	6.4	10.4	24.2	53.2	100.0
2004	1.1	4.2	5.9	9.8	25.7	53.3	100.0
2005	1.0	3.9	5.3	9.5	25.7	54.6	100.0
2006	1.0	3.5	4.8	9.2	25.6	55.9	100.0
2007	0.9	2.7	3.7	8.2	24.4	60.1	100.0
2008	0.9	2.5	3.5	8.0	24.0	61.1	100.0
2009	0.9	2.3	3.3	7.5	24.0	62.0	100.0
2010	0.8	2.1	3.1	8.0	25.0	61.0	100.0
2011	0.8	2.0	2.7	7.5	24.9	62.1	100.0
2012	0.8	1.9	2.6	7.5	25.5	61.9	100.0

[1]Source: NASS.
[2]Only estimates of 1,000 or more head were available in 1990–92.

Except in 1990, 1993, and 1998, fewer pigs were weaned per litter in December through February than during the other quarters. Since 1990, the average number of pigs weaned per litter has increased across quarters by more than one piglet.

A.2.d. Changes in the quarterly average number of pigs weaned per litter, per quarter, 1990–2012:[1]

Year	Dec–Feb[2]	Pct. 1995	Pct. 2000	Mar–May	Pct. 1995	Pct. 2000	Jun–Aug	Pct. 1995	Pct. 2000	Sep–Nov	Pct. 1995	Pct. 2000
1990	7.83			7.94			7.90			7.82		
1991	7.87			7.96			7.89			7.89		
1992	8.04			8.08			8.14			8.05		
1993	8.14			8.13			8.09			8.05		
1994	8.10			8.26			8.21			8.16		
1995	8.24	100.0		8.32	100.0		8.34	100.0		8.35	100.0	
1996	8.43	102.3		8.48	101.9		8.55	102.5		8.54	102.3	
1997	8.63	104.7		8.67	104.2		8.72	104.6		8.67	103.8	
1998	8.70	105.6		8.75	105.2		8.72	104.6		8.66	103.7	
1999	8.73	105.9		8.80	105.8		8.86	106.2		8.78	105.1	
2000	8.76	106.3	100.0	8.86	106.5	100.0	8.84	106.0	100.0	8.85	106.0	100.0
2001	8.72	105.8	99.5	8.89	106.9	100.3	8.89	106.6	100.6	8.85	106.0	100.0
2002	8.77	106.4	100.1	8.84	106.3	99.8	8.92	107.0	100.9	8.86	106.1	100.1
2003	8.81	106.9	100.6	8.88	106.7	100.2	8.90	106.7	100.7	8.93	106.9	100.9
2004	8.85	107.4	101.0	8.93	107.3	100.8	9.01	108.0	101.9	8.96	107.3	101.2
2005	8.94	108.5	102.1	9.02	108.4	101.8	9.06	108.6	102.5	9.03	108.1	102.0
2006	9.03	109.6	103.1	9.08	109.1	102.5	9.11	109.2	103.1	9.11	109.1	102.9
2007	9.09	110.3	103.8	9.20	110.6	103.8	9.29	111.4	105.1	9.28	111.1	104.9
2008	9.24	112.1	105.5	9.38	112.7	105.9	9.51	114.0	107.6	9.50	113.8	107.3
2009	9.18	115.0	108.2	9.61	115.5	108.5	9.70	116.3	109.7	9.70	116.2	109.6
2010	9.61	116.6	109.7	9.81	117.9	110.7	9.81	117.6	111.0	9.89	118.4	111.8
2011	9.80	119.0	111.9	10.03	120.6	113.2	10.03	120.3	113.5	10.02	120.0	113.2
2012	9.97	121.0	113.8	10.09	121.3	113.9	10.13	121.5	114.6	10.15	121.6	114.7

[1]Source: NASS. Ratio of expected number of pigs weaned to sows/gilts farrowed.
[2]December preceding year.

B. U.S. Pork Industry Changes—Inventories by State

The two tables in this section describe pork industry changes by State for 1990, 2000, 2006, and 2012. The pig inventories and number of sites are by State and based on NASS data. The tables also identify which States participated in the four NAHMS national swine studies. Based on the December 1, 2012, inventory, levels have increased 121.7 percent since 1990. Inventory has become more concentrated in large swine States such as Iowa, North Carolina, and Minnesota and has declined in traditional swine States such as Illinois, Indiana, South Dakota, and Wisconsin. Several western States have seen increases in pig inventory since 1990, including Utah, Oklahoma, Colorado, Arizona, and Texas.

B.1. Changes in number of pigs by State:*

State	**Total Pigs** (1,000 head)				**Percent Change**		
	Dec. 1, 1990	Dec. 1, 2000	Dec. 1, 2006	Dec. 1, 2012	2012 pct. of 1990	2012 pct. of 2000	2012 pct. of 2006
Alabama[1]	335	165	165	140	41.8	84.8	84.8
Alaska	1.2	0.8	0.9	1	83.3	125.0	111.1
Arizona	110	9	148	170	154.5	1,888.9	114.9
Arkansas[3 4]	760	685	260	110	14.5	16.1	42.3
California[1]	195	150	145	105	53.8	70.0	72.4
Colorado[1 3 4]	300	840	840	720	240.0	85.7	85.7
Connecticut	7	4	3	2.2	31.4	55.0	73.3
Delaware	31	20	10.5	4	13.0	20.0	38.1
Florida	130	40	20	15	11.5	37.5	75.0
Georgia[1 2]	1,100	380	245	155	14.1	40.8	63.3
Hawaii	36	26	16	12	33.3	46.2	75.0
Idaho	60	24	25	—	—	—	—
Illinois[1 2 3 4 5]	5,700	4,150	4,200	4,600	80.1	110.8	109.5
Indiana[1 2 3 4 5]	4,400	3,350	3,350	3,800	86.4	113.4	113.4
Iowa[1 2 3 4 5]	13,800	15,100	17,300	20,600	149.3	136.4	119.1
Kansas[2 3 4 5]	1,500	1,520	1,860	1,910	127.3	125.7	102.7
Kentucky [2]	920	430	340	315	34.2	73.3	92.6
Louisiana	50	29	14	7	14.0	24.1	50.0
Maine	8	6	4.5	4.5	56.3	75.0	100.0
Maryland[1]	162	40	33	20	12.3	50.0	60.6
Massachusetts	33	21	13	11	33.3	52.4	84.6
Michigan[1 2 3 4]	1,250	950	990	1,080	86.4	113.7	110.1
Minnesota[1 2 3 4 5]	4,500	5,800	6,900	7,650	170.0	131.9	110.9
Mississippi	149	315	335	415	278.5	131.7	123.9
Missouri[2 3 4 5]	2,800	2,900	2,800	2,750	98.2	94.8	98.2
Montana	185	155	180	175	94.6	112.9	97.2
Nebraska[1 2 3 4 5]	4,300	3,050	3,050	3,000	69.8	98.4	98.4
Nevada	14	7.5	3.5	2.7	19.3	36.0	77.1
New Hampshire	6	4	2.8	3.3	55.0	82.5	117.9
New Jersey	25	14	9	8	32.0	57.1	88.9
New Mexico	27	3	2	1.3	4.8	43.3	65.0

*Source: NASS.

[1]Participated in 1990 National Swine Survey (total of 18 States).

[2]Participated in Swine 1995 study (total of 16 States).

[3]Participated in Swine 2000 study (total of 17 States).

[4]Participated in Swine 2006 study (total of 17 States).

[5]Participated in Swine 2012 study (total of 13 States).

continued →

B.1. Changes in number of pigs by State (cont'd):

State	Total Pigs (1,000 head)				Percent Change		
	Dec. 1, 1990	Dec. 1, 2000	Dec. 1, 2006	Dec. 1, 2012	2012 pct. of 1990	2012 pct. of 2000	2012 pct. of 2006
New York	103	80	98	66	64.1	82.5	67.3
North Carolina[1 2 3 4 5]	2,800	9,300	9,500	9,000	321.4	96.8	94.7
North Dakota	265	185	168	135	50.9	73.0	80.4
Ohio[1 2 3 4 5]	2,000	1,490	1,680	2,045	102.3	137.2	121.7
Oklahoma[3 4 5]	215	2,310	2,330	2,320	1,079.1	100.4	99.6
Oregon[1]	80	32	22	12.5	15.6	39.1	56.8
Pennsylvania[1 2 3 4 5]	920	1,030	1,080	1,130	122.8	109.7	104.6
Rhode Island	5	2.5	2.1	1.9	38.0	76.0	90.5
South Carolina	400	290	295	240	60.0	82.8	81.4
South Dakota[2 3 4 5]	1,770	1,320	1,270	1,200	67.8	90.9	94.5
Tennessee[1 2]	620	230	220	150	24.2	65.2	68.2
Texas[3 4 5]	550	920	940	820	149.1	89.1	87.2
Utah	33	550	680	740	2,242.4	134.5	108.8
Vermont	5	2.5	2.5	3.9	78.0	156.0	156.0
Virginia[1]	430	425	365	230	53.5	54.1	63.0
Washington	56	27	36	—	—	—	—
W. Virginia	30	10	11	6	20.0	60.0	54.5
Wisconsin[1 2 3 4]	1,200	610	450	320	26.7	52.5	71.1
Wyoming	20	108	100	86	430.0	79.6	86.0
U.S.	54,416	59,110	62,516	66,348	121.9	112.2	106.1

Source: NASS.

[1]Participated in 1990 National Swine Survey (total of 18 States).

[2]Participated in Swine 1995 study (total of 16 States).

[3]Participated in Swine 2000 study (total of 17 States).

[4]Participated in Swine 2006 study (total of 17 States).

[5]Participated in Swine 2012 study (total of 13 States).

In general, the number of swine sites in the Southern States has declined. In addition, over the last decade major swine producing States such as Minnesota and Iowa had decreases in the number of swine sites.

B.2. Number of and changes in the number of swine sites:

	Number of Sites				Percent Change		
State	1990	2000	2006	2012*	2012 as pct. of 1990	2012 as pct. of 2000	2012 as pct. of 2006
Alabama[1]	4,500	700	450	689	15.3	98.4	153.1
Alaska	40	50	50	37	92.5	74.0	74.0
Arizona	400	230	150	509	127.3	221.3	339.3
Arkansas[3 4]	3,100	1,100	750	752	24.3	68.4	100.3
California[1]	4,000	1,000	800	1,437	35.9	143.7	179.6
Colorado[1 3 4]	2,000	900	800	1,001	50.1	111.2	125.1
Connecticut	450	180	250	318	70.7	176.7	127.2
Delaware	420	100	70	59	14.0	59.0	84.3
Florida	5,000	1,400	1,100	1,642	32.8	117.3	149.3
Georgia[1 2]	8,000	1,200	700	866	10.8	72.2	123.7
Hawaii	500	230	230	231	46.2	100.4	100.4
Idaho	2,000	400	650	680	34.0	170.0	104.6
Illinois[1 2 3 4 5]	15,300	5,100	2,900	2,045	13.4	40.1	70.5
Indiana[1 2 3 4 5]	13,000	4,400	2,800	2,757	21.2	62.7	98.5
Iowa[1 2 3 4 5]	35,000	12,300	8,700	6,266	17.9	50.9	72.0
Kansas[2 3 4 5]	6,000	1,600	1,400	1,010	16.8	63.1	72.1
Kentucky [2]	6,500	1,300	900	1,284	19.8	98.8	142.7
Louisiana	2,500	650	600	658	26.3	101.2	109.7
Maine	1,600	300	370	752	47.0	250.7	203.2
Maryland[1]	1,400	430	400	333	23.8	77.4	83.3
Massachusetts	850	300	300	478	56.2	159.3	159.3
Michigan[1 2 3 4]	5,500	2,500	2,100	2,198	40.0	87.9	104.7
Minnesota[1 2 3 4 5]	15,000	7,300	4,800	3,355	22.4	46.0	69.9
Mississippi	6,000	1,500	1,000	540	9.0	36.0	54.0
Missouri[2 3 4 5]	16,000	3,600	2,000	2,128	13.3	59.1	106.4
Montana	1,500	650	500	406	27.1	62.5	81.2
Nebraska[1 2 3 4 5]	12,500	4,000	2,500	1,476	11.8	36.9	59.0
Nevada	140	100	110	81	57.9	81.0	73.6
New Hampshire	750	250	300	359	47.9	143.6	119.7
New Jersey	700	400	300	298	42.6	74.5	99.3
New Mexico	900	400	350	211	23.4	52.8	60.3

*Source: NASS 2012 Census of Agriculture.

[1]Participated in 1990 National Swine Survey (total of 18 States).

[2]Participated in Swine 1995 study (total of 16 States).

[3]Participated in Swine 2000 study (total of 17 States).

[4]Participated in Swine 2006 study (total of 17 States).

[5]Participated in Swine 2012 study (total of 13 States).

continued →

B.2. Number of and changes in the number of swine sites (cont'd):

State	Number of Sites				Percent Changes		
	1990	2000	2006	2012*	2012 as pct. of 1990	2012 as pct. of 2000	2012 as pct. of 2006
New York	2,900	1,100	1,200	1,912	65.9	173.8	159.3
North Carolina[1 2 3 4 5]	10,000	3,600	2,300	2,217	22.2	61.6	96.4
North Dakota	2,100	700	430	218	10.4	31.1	50.7
Ohio[1 2 3 4 5]	13,600	5,200	4,000	3,494	25.7	67.2	87.4
Oklahoma[3 4 5]	5,200	2,700	2,600	1,947	37.4	72.1	74.9
Oregon[1]	2,400	1,000	1,100	1,124	46.8	112.4	102.2
Pennsylvania[1 2 3 4 5]	7,500	3,300	3,200	3,097	41.3	93.8	96.8
Rhode Island	90	50	50	77	85.6	154.0	154.0
South Carolina	5,500	900	1,100	838	15.2	93.1	76.2
South Dakota[2 3 4 5]	7,700	1,900	1,100	681	8.8	35.8	61.9
Tennessee[1 2]	8,500	1,500	1,100	1,297	15.3	86.5	117.9
Texas[3 4 5]	11,000	4,300	3,700	4,905	44.6	114.1	132.6
Utah	900	500	450	669	74.3	133.8	148.7
Vermont	1,100	250	280	450	40.1	180.0	160.7
Virginia[1]	3,500	1,200	850	1,265	36.1	105.4	148.8
Washington	2,500	800	900	934	37.3	116.8	103.8
W. Virginia	2,300	1,000	900	725	31.5	72.5	80.6
Wisconsin[1 2 3 4]	9,400	2,700	2,200	2,270	24.1	84.1	103.2
Wyoming	400	200	150	270	67.5	135.0	180.0
U.S.	268,140	87,470	65,940	63,246	23.6	72.3	95.9

*Source: NASS 2012 Census of Agriculture.

[1]Participated in 1990 National Swine Survey (total of 18 States).

[2]Participated in Swine 1995 study (total of 16 States).

[3]Participated in Swine 2000 study (total of 17 States).

[4]Participated in Swine 2006 study (total of 17 States).

[5]Participated in Swine 2012 study (total of 13 States).

C. World Pork Production Changes—Inventories by Country

Since 1991, the pig inventory in the Republic of Korea has nearly doubled, while that of the Russian Federation is only 45 percent of what it was in 1991.

C.1. Changes in pig inventories, by continent/country:*

Continent/Country		January 1 Inventory (1,000 head) 1991	1996	2001	2006	2012
North America	Canada	10,172	11,588	13,576	15,110	12,625
	Mexico	8,593	11,100	9,372	8,911	9,276
	United States	54,416	58,201	59,110	61,463	66,259
	Subtotal	*73,181*	*80,889*	*82,058*	*85,484*	*88,160*
South America	Brazil	32,550	32,068	32,440	32,938	38,336
European Union		116,668[1]	115,959[1]	158,765[2]	159,364[2]	149,809[2]
Former Soviet Union	Russian Federation	38,314	22,631	15,824	13,812	17,258
	Ukraine	19,427	13,144	7,652	7,052	7,373
	Subtotal	*57,741*	*35,775*	*23,476*	*20,864*	*24,631*
Asia	Peoples Republic of China	362,408	441,692	416,836	433,191	468,627
	Japan	11,355	9,900	9,788	9,620	9,735
	Republic of Korea	4,528	6,461	7,350	8,098	8,171
	Philippines	8,007	9,023	11,715	13,041	NA
	Taiwan	8,565	10,510	7,495	7,172	NA
	Subtotal	*394,863*	*477,586*	*452,684*	*471,122*	*486,533*
Oceania	Australia	2,530	2,600	2,748	2,358	2,285
World total[3]		726,092	784,375	783,883	875,198	751,418

*Statistical data provided by Foreign Agriculture Service.

[1]European Union–includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and U.K.

[2]European Union–includes Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and U.K.

[3]Includes countries not presented in table.

C.2. Changes in pig inventory percentages in selected countries:*

Continent/Country		2001 as pct. of 1996	2006 as pct. of 2001	2012 as pct. of 1991	2012 as pct. of 1996	2012 as pct. of 2001	2012 as pct. of 2006
North America	Canada	117.2	111.3	124.1	108.9	93.0	83.6
	Mexico	84.4	95.1	107.9	83.6	99.0	104.1
	United States	101.6	104.0	121.8	113.8	112.1	107.8
	Subtotal	*101.4*	*104.2*	*120.5*	*109.0*	*107.4*	*103.1*
South America	Brazil	101.2	101.5	117.8	119.5	118.2	116.4
European Union		NC	99.1	128.4	129.2	94.4	95.2
Former Soviet Union	Russian Federation	69.9	87.3	45.0	76.3	109.1	124.9
	Ukraine	58.2	92.2	38.0	56.1	96.4	104.6
	Subtotal	*65.6*	*88.9*	*42.7*	*68.8*	*104.9*	*118.1*
Asia	China, Peoples Republic of	94.3	104.0	129.3	106.1	112.6	108.2
	Japan	98.9	98.3	85.7	98.3	99.5	101.2
	Korea, Republic of	113.8	110.2	180.5	126.5	111.2	100.9
	Philippines	129.8	111.3	NC	NC	NC	NC
	Taiwan	71.3	95.7	NC	NC	NC	NC
	Subtotal	*94.8*	*104.1*	*123.2*	*101.9*	*107.5*	*103.3*
Oceania	Australia	105.7	85.8	90.3	87.9	83.2	96.9
World total[1]		97.7	103.8	103.2	99.8	102.2	98.5

*Statistical data provided by Foreign Agriculture Service.

[1]Includes countries not presented in table.

NC = Not comparable.

Section II: Management and Productivity Changes in the U.S. Pork Industry: NAHMS Population Estimates 1995, 2000, 2006, and 2012

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

The NAHMS Swine '95 study collected data on sites with 1 or more or more pigs, while the Swine 2000, 2006, and 2012 studies collected data on sites with 100 or more pigs. For this report, to account for the discrepancy in study populations, estimates for 1995 reflect only sites with 100 or more pigs. Therefore, 1995 estimates might differ from estimates previously published in the Swine '95 Part I report.

A. Production Phases

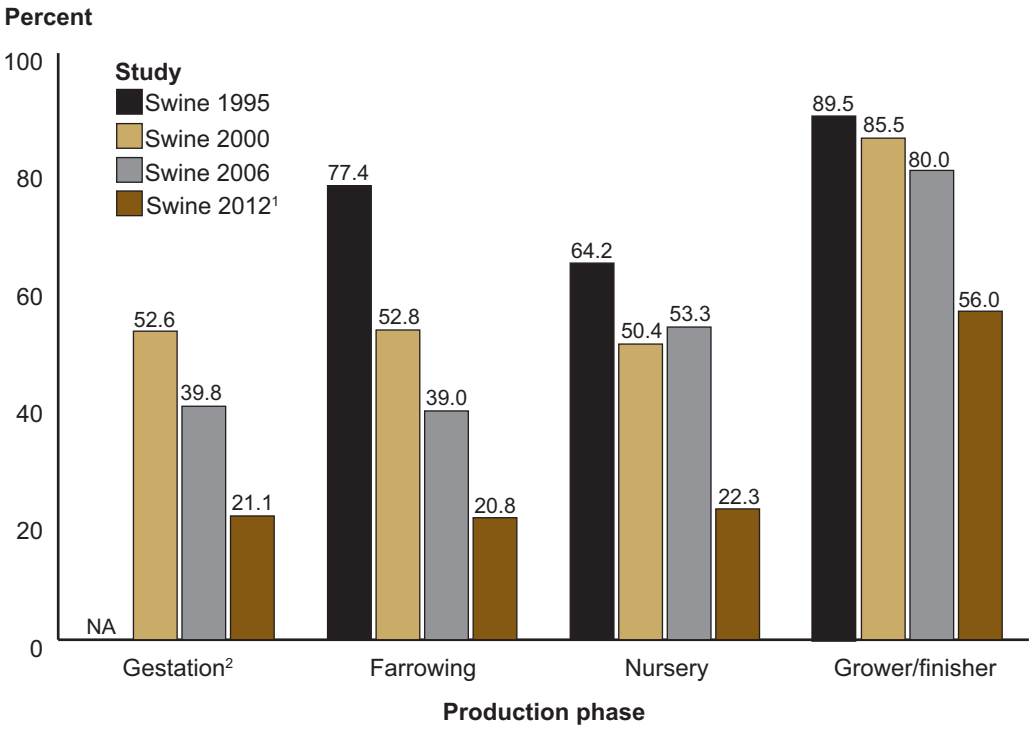
Approximately one-fifth of sites had a farrowing phase in 2012 compared with over three-fourths of sites in 1995. The percentage of sites with a gestation phase in 2012 was less than half of what it was in 2000.

A.1. Percentage of sites by production phase and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012[1]	
Production phase	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Gestation	NA[2]		52.6	(1.7)	39.8	(1.2)	21.1	(2.6)
Farrowing	77.4	(2.2)	52.8	(1.7)	39.0	(1.2)	20.8	(2.6)
Nursery	64.2	(2.4)	50.4	(1.7)	53.3	(1.3)	22.3	(3.0)
Grower/finisher	89.5	(1.5)	85.5	(1.1)	80.0	(1.0)	56.0	(5.3)
Wean to finish[3]	NA		NA		NA		24.4	(4.5)

[1]In 1995, 2000, and 2006, the question asked which production phases were on-site. In 2012, the question asked whether animals of the production-phase type were present from December 1, 2011, through May 31, 2012.
[2]Gestation question not asked in 1995.
[3]Wean-to-finish-phase question not asked in 1995, 2000, and 2006.

Percentage of sites by production phase and by study



[1]In 1995, 2000, and 2006, the question asked which production phases were present on-site. In 2012, the question asked whether animals of the production-phase type were present from December 1, 2011, through May 31, 2012.

[2]Question not asked in 1995.

Increased site specialization has resulted in a decrease in the percentage of sites with gestation and farrowing phases. In 1995, more than half of sites had the three production phases normally associated with traditional “farrow-to-finish” sites compared with only 6.0 percent of sites in 2012. Conversely, over 40 percent of sites specialized in the grower/finisher phase in 2012, more than twice the percentage reported in 1995.

A.2. Percentage of sites by production phase and by study:

	Percent Sites							
	Study							
	Swine 1995[1]		Swine 2000		Swine 2006		Swine 2012[2]	
Production phase	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Breeding only	2.2	(0.9)	5.1	(0.7)	7.6	(0.7)	7.5	(1.2)
Breeding and nursery	7.9	(1.4)	4.5	(0.7)	3.7	(0.5)	1.6	(0.3)
Breeding and grower/finisher	12.7	(1.7)	7.8	(1.2)	1.3	(0.3)	0.8	(0.2)
Breeding, nursery, and grower/finisher	54.5	(2.5)	34.4	(1.7)	26.3	(1.2)	6.0	(0.9)
Breeding and wean-to-finish	NA		NA		NA		3.8	(0.6)
Nursery and grower/finisher	1.3	(0.6)	6.8	(0.7)	15.3	(0.9)	5.7	(0.8)
Nursery only	0.4	(0.1)	4.1	(0.5)	7.8	(0.6)	8.2	(2.3)
Grower/finisher only	20.9	(2.2)	35.5	(1.6)	36.9	(1.2)	42.7	(6.4)
Wean-to-finish only	NA		NA		NA		19.9	(4.0)
Other combination	0.1	(0.0)	1.8	(0.6)	1.0	(0.3)	3.7	(0.6)
Total	100.0		100.0		100.0		100.0	

[1]In 1995, producers were not asked if they had a gestation phase; so for that year “breeding” consisted only of sites that said they had a farrowing phase.
[2]Refers to the period from December 1, 2011, through May 31, 2012.

B. Sow and Gilt Management

1. Mating techniques

Of sites that did not exclusively use pen-mating, over 90 percent used artificial insemination (AI) for at least one mating of sows or gilts in 2012, which was over four times the percentage of sites that did so in 2000.

B.1.a. For sites that did not exclusively use pen-mating, percentage of sites by predominant mating technique used in at least one mating of sows or gilts, and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006*		Swine 2012*	
Mating technique	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Artificial insemination	23.2	(1.7)	84.8	(2.5)	91.1	(1.5)
Individual hand-mating naturally	13.0	(1.3)	23.2	(2.8)	9.5	(1.7)
Pen-mating with multiple females and one or more boars	73.3	(1.8)	10.9	(2.3)	10.4	(1.7)

*Swine 2006 and 2012 asked for information on first, second, or third or more matings, while Swine 2000 only asked about first and second matings.

B.1.b. For sites that did not exclusively use pen-mating, percentage of sows or gilts serviced on-site, by predominant mating technique used in at least one mating, and by study:

	Percent Sows and Gilts					
	Study					
	Swine 2000		Swine 2006*		Swine 2012*	
Mating technique	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Artificial insemination	72.6	(2.1)	93.2	(4.7)	99.1	(0.3)
Individual hand-mating naturally	17.0	(2.9)	10.2	(4.6)	1.9	(0.9)
Pen-mating with multiple females and one or more boars	25.9	(2.1)	8.5	(4.7)	1.8	(0.5)

*Swine 2006 and 2012 studies asked for information on first, second, or third or more matings, whereas Swine 2000 only asked about first and second matings.

2. Culling

A higher percentage of animals were culled in 2006 and 2012 than in 2000. When animals were culled, age and reproductive failure were the most common reasons for culling in 2000 and 2012.

B.2.a. Breeding-age females culled from December 1 through May 1 of given year, as a percentage of sow and gilt inventory, by study:

Percent Sows and Gilts

Study									
Swine 1995		Swine 2000		Swine 2006		Swine 2006*		Swine 2012	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
20.0	(0.9)	17.5	(0.7)	19.5	(0.9)	21.1	(0.9)	25.1	(1.1)

*This number differs from the 2006 part I report due to matching 2000 and 2012 estimates, which included only sows and bred gilts for breeding in the denominator.

B.2.b. Percentage of culled breeding-age females from December 1 through May 31 of given year, by reason culled and by study:

Percent Culled Breeding-age Females

	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Reason culled	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Age	40.2	(2.2)	41.9	(1.8)	36.6	(2.6)	35.2	(3.6)
Lameness	9.6	(0.8)	16.0	(1.2)	15.2	(2.3)	6.8	(1.2)
Performance[1]	34.5	(2.3)	12.0	(0.7)	13.0	(1.1)	13.5	(2.3)
Disease	2.6	(0.7)	NA		NA		NA	
Reproductive failure	NA		21.3	(1.3)	26.3	(1.9)	25.4	(3.5)
Injury	NA		NA		4.0	(0.6)	2.5	(0.6)
Other[2]	13.1	(2.5)	8.8	(1.6)	4.9	(0.8)	16.5	(6.9)
Total	100.0		100.0		100.0		100.0	

[1]Small litter size, high preweaning mortality, or low birth weight.
[2]Responses included other health problems or multiple causes.

3. Introduction of breeding animals

The frequency of isolation or quarantine for new breeding females remained unchanged from 1995 to 2006.

B.3.a. Percentage of sites by frequency that new breeding females were typically isolated or quarantined, and by study:

	Percent Sites*					
	Study					
	Swine 1995		Swine 2000		Swine 2006	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Always	23.8	(2.1)	32.0	(2.2)	34.3	(2.0)
Sometimes	9.0	(1.3)	8.1	(1.4)	5.0	(0.9)
Never	22.0	(2.2)	16.9	(1.8)	17.0	(1.6)
No new arrivals	45.2	(2.6)	43.0	(2.4)	43.7	(2.2)
Total	100.0		100.0		100.0	

*Data not available for 2012.

The percentage of sites that always isolated new breeding males was much lower in 2012 than in 1995, 2000, and 2006. In 2012, a higher percentage of sites did not introduce any new breeding males compared with the other study years. The decrease in the percentage of sites that always isolated or quarantined new males might indicate a higher trust in the source of new animals (e.g., known health status of the herd of origin). Frequency of isolation or quarantine for breeding males remained unchanged from 1995 to 2006.

B.3.b. Percentage of sites by frequency that new breeding males were typically isolated or quarantined:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Frequency	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Always	43.5	(2.4)	54.8	(2.4)	48.6	(2.2)	18.8	(2.9)
Sometimes	11.1	(1.7)	11.3	(1.6)	10.1	(1.4)	2.2	(0.5)
Never	18.2	(1.8)	20.2	(2.0)	20.2	(1.8)	8.1	(2.1)
No new arrivals	27.2	(2.3)	13.7	(1.5)	21.1	(1.7)	70.9	(3.5)
Total	100.0		100.0		100.0		100.0	

The average number of days newly arriving breeding males were quarantined remained relatively constant over the last three swine studies, as did the percentage of sites that tested all males before entry into the breeding herd.

B.3.c. For sites that always or sometimes isolated or quarantined new arrivals, site average number of days new arrivals were isolated or quarantined, by gender and by study:

	Site Average Number of Days					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Gender	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
Breeding females	38.7	(1.5)	37.0	(1.3)	*	
Breeding males	34.3	(0.9)	32.6	(1.1)	38.1	(2.3)

*Data not available.

B.3.d. For sites with newly arrived breeding females, percentage of sites that typically tested new females for disease before introduction to the breeding herd, by proportion of females tested and by study:

	Percent Sites*			
	Study			
	Swine 2000		Swine 2006	
Proportion females	Percent	Std. error	Percent	Std. error
All	43.5	(3.7)	38.6	(2.7)
Some	16.8	(2.4)	20.1	(2.3)
None	39.7	(3.8)	41.3	(2.8)
Total	100.0		100.0	

*Data not available for 2012.

B.3.e. For sites with newly arrived breeding males, percentage of sites that typically tested new males for disease before introduction to the breeding herd, by proportion of males tested and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Proportion males	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
All	51.8	(3.1)	41.0	(2.4)	41.3	(5.9)
Some	8.3	(1.4)	13.6	(1.8)	21.0	(8.9)
None	39.9	(3.2)	45.4	(2.5)	37.7	(6.5)
Total	100.0		100.0		100.0	

Vaccinating breeding stock as a method of acclimating new arrivals was performed on roughly the same percentage of sites in 2000 and 2012.

B.3.f. For sites with newly arriving breeding stock, percentage of sites by method used to acclimate new arrivals, and by study:

	Percent Sites					
	Study					
	Swine 2000*		Swine 2006		Swine 2012	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Feedback of feces from other swine	25.1	(2.8)	20.8	(1.9)	32.8	(5.6)
Feedback of mummies, placentas, or stillborn pigs	11.3	(1.9)	8.8	(1.4)	14.9	(3.3)
Exposure to cull females	49.0	(3.7)	35.8	(2.2)	44.2	(3.7)
Exposure to sick pigs	7.7	(1.5)	6.0	(1.2)	11.3	(3.2)
Give vaccinations	84.1	(2.7)	67.1	(2.3)	76.9	(2.5)
Other	2.6	(1.2)	5.5	(1.2)	4.1	(0.9)

*In 2000, this question was limited to newly arriving breeding females.

4. Facility type

Of sites with a gestation phase, a lower percentage in 2012 than in 2000 primarily housed pigs in an open building with outside access. A higher percentage of operations in 2012 than in 2000 and 2006 housed gestating animals in an open building with no outside access, suggesting a move toward more naturally ventilated systems for gestation pigs.

B.4. For sites with a gestation phase, percentage of sites by primary facility type used and by study:

	Percent Sites							
	Study							
	Swine 1995[1]		Swine 2000		Swine 2006		Swine 2012[2]	
Facility type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Total confinement	NA		22.4	(1.6)	34.6	(1.9)	38.6	(2.5)
Open building with no outside access	NA		13.9	(1.9)	13.3	(1.5)	25.1	(2.1)
Open building with outside access	NA		45.2	(2.5)	37.3	(2.2)	25.2	(1.8)
Lot with hut or no building	NA		10.3	(1.4)	8.6	(1.2)	6.5	(0.8)
Pasture with hut or no building	NA		8.2	(1.4)	6.2	(1.0)	4.6	(0.7)
Total			100.0		100.0		100.0	

[1]In 1995, the questionnaire did not ask if there was a gestation phase.
[2]In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

5. Pig flow

Over 60 percent of sites with a gestation phase in 2000, 2006, and 2012 used continuous flow management.

B.5. For sites with a gestation phase, percentage of sites by pig-flow management style and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012[1]	
Management style	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Continuous flow	71.4	(2.2)	61.5	(2.1)	73.7	(1.8)
All swine removed without cleaning and disinfecting	4.2	(1.0)	4.6	(1.0)	3.5	(0.6)
All-in/all-out by room[2]	5.5	(0.7)	10.0	(1.3)	9.1	(1.0)
All-in/all-out by building[2]	12.2	(1.8)	7.7	(1.2)	9.0	(1.0)
All-in/all-out by site[2]	1.6	(0.6)	1.4	(0.5)	1.0	(0.3)
Not applicable (no housing)	5.1	(1.0)	14.8	(1.5)	3.8	(0.6)
Total	100.0		100.0		100.0	

[1]In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.
[2]In 2006 and 2012 this response included the phrase “with (room, building, site) cleaned and disinfected.”

6. Waste management

The percentage of sites that used pit-holding as a waste management system increased steadily from 2000 to 2012. In 2012, about half of sites with a gestation phase pit-held manure. The percentage of sites that used flush under slats remained the same from 2000 to 2006, but increased from 2000 to 2012.

B.6. For sites with a gestation phase, percentage of sites by primary type of waste management system used in the gestation facility, and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012[1]	
Primary waste management system	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	14.1	(1.5)	13.5	(1.5)	3.9	(0.8)
Pit-holding	19.4	(1.6)	30.1	(1.9)	52.0	(3.7)
Mechanical scraper/tractor	32.5	(2.6)	30.2	(2.1)	11.2	(1.6)
Hand cleaned	19.1	(2.1)	14.0	(1.6)	4.2	(0.9)
Flush—under slats	5.9	(0.5)	9.3	(1.0)	22.9	(4.7)
Flush—open gutter	1.8	(0.4)	1.8	(0.4)	2.3	(0.8)
Other	7.2	(1.3)	1.1	(0.4)	3.5	(0.8)
Total	100.0		100.0		100.0	

[1]In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

C. Farrowing Phase

1. Farrowing productivity and death loss

In the 20-plus years since the 1995 swine study, the swine industry has gained an average of about one more pig born alive per litter and subsequently weaned.

C.1.a. Site average per-litter productivity from December through May of each study year:

Site Average Per Litter Productivity

Study

Measure (per litter)	Swine 1995				Swine 2000				Swine 2006				Swine 2012			
	No.	**Std. err.**	**Pct.**	**Std. err.**	**No.**	**Std. err.**	**Pct.**	**Std. err.**	**No.**	**Std. err.**	**Pct.**	**Std. err.**	**No.**	**Std. err.**	**Pct.**	**Std. err.**
Stillbirths and mummies	0.6	(0.0)	6.2	(0.4)	0.9	(0.0)	8.0	(0.2)	1.0	(0.0)	8.4	(0.3)	1.0	(0.0)	8.6	(0.2)
Born alive	9.3	(0.1)	93.8	(0.4)	10.0	(0.0)	92.0	(0.2)	10.5	(0.1)	91.6	(0.3)	10.3	(0.2)	91.4	(0.2)
Total born	9.9	(0.1)	100.0		10.9	(0.0)	100.0		11.5	(0.1)	100.0		11.2	(0.2)	100.0	
Preweaning deaths	0.9	(0.0)	9.1	(0.4)	1.1	(0.0)	11.0	(0.3)	1.1	(0.0)	10.9	(0.4)	1.0	(0.1)	9.7	(0.6)
Weaned	8.4	(0.1)	90.9	(0.4)	8.9	(0.0)	89.0	(0.3)	9.4	(0.1)	89.1	(0.4)	9.3	(0.1)	90.3	(0.6)
Total born alive	9.3	(0.1)	100.0		10.0	(0.0)	100.0		10.5	(0.1)	100.0		10.3	(0.2)	100.0	

The percentages of piglets that died by cause of death were similar across study years. Being lain on accounted for about half of all piglet deaths.

C.1.b. Percentage of preweaning deaths from December through May of each study year, by producer-identified cause:

	Percent Preweaning Deaths							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Cause	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Scours	16.4	(2.5)	9.3	(1.2)	9.3	(1.1)	10.2	(2.1)
Lain on	47.0	(2.2)	52.1	(1.8)	54.5	(1.9)	48.8	(2.3)
Starvation	15.7	(2.7)	16.7	(2.0)	13.8	(1.2)	15.1	(1.8)
Respiratory	NA		3.0	(0.4)	4.7	(1.3)	4.4	(1.3)
Other known problem*	9.9	(1.4)	11.5	(1.5)	9.9	(1.7)	15.8	(5.0)
Unknown problem	11.0	(1.3)	7.4	(0.8)	7.8	(1.1)	5.8	(1.4)
Total	100.0		100.0		100.0		100.0	

*Included responses such as low viability or multiple causes.

2. Weaning age

In 2012, the average weaning age was about 5 days less than it was in 1995. A higher percentage of sites in 2012 than in 1995 weaned piglets at 16 to 20 days of age.

C.2.a. Average age of piglets (in days) at weaning from December through May of each study year:

Average Age (days)

Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
25.0	(0.5)	19.3	(0.2)	19.4	(0.2)	20.8	(0.2)

C.2.b. Percentage of sites by age of piglets at weaning from December through May of each study year:

Percent Sites

Weaning age (days)	Swine 1995*		Swine 2000		Swine 2006		Swine 2012	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Less than 16	1.6	(0.6)	4.9	(1.0)	2.7	(0.7)	0.5	(0.2)
16–20	6.1	(0.9)	20.3	(1.6)	24.1	(1.7)	23.8	(2.0)
21–27	22.6	(2.2)	27.3	(2.2)	30.8	(2.1)	40.3	(3.2)
28–34	33.7	(2.8)	18.9	(2.0)	17.5	(1.8)	18.1	(1.5)
35 or more	36.0	(2.5)	28.6	(2.4)	24.9	(2.0)	17.2	(1.4)
Total	100.0		100.0		100.0		100.0	

*No time frame in 1995.

3. Facility type

Of sites with a farrowing phase, a higher percentage used an open building with outside access in 1995 than in 2012.

C.3. For sites with a farrowing phase, percentage of sites by primary facility type used and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012*	
Primary facility type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Total confinement	61.9	(2.7)	64.8	(2.5)	67.7	(2.1)	71.8	(2.1)
Open building with no outside access	8.4	(1.6)	12.2	(1.8)	10.6	(1.4)	13.9	(2.0)
Open building with outside access	22.9	(2.6)	17.0	(2.2)	15.1	(1.7)	9.0	(1.0)
Lot with hut or no building	4.0	(0.9)	3.4	(0.9)	3.3	(0.7)	1.9	(0.4)
Pasture with hut or no building	2.8	(0.8)	2.6	(0.9)	3.3	(0.8)	3.4	(0.6)
Total	100.0		100.0		100.0		100.0	

*In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

4. Pig flow

Of sites with a farrowing phase, the percentage that used continuous-flow management decreased from 2000 to 2012, while during the same period the percentage of sites that used all-in/all-out by room management increased.

C.4. For sites with a farrowing phase, percentage of sites by pig-flow management style and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012[1]	
Management style	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Continuous flow	38.7	(2.5)	33.5	(2.1)	27.9	(2.0)
All swine removed without cleaning and disinfecting	5.8	(1.4)	4.7	(1.1)	2.8	(0.5)
All-in/all-out by room[2]	25.2	(1.7)	37.1	(2.0)	47.0	(2.9)
All-in/all-out by building[2]	24.7	(2.2)	16.1	(1.6)	18.2	(1.5)
All-in/all-out by site[2]	1.2	(0.5)	1.9	(0.6)	1.7	(0.4)
Not applicable (no housing)	4.4	(1.2)	6.7	(1.0)	2.4	(0.5)
Total	100.0		100.0		100.0	

[1]In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.
[2]In 2006 and 2012 this response included the phrase “with (room, building, site) cleaned and disinfected.”

5. Waste management

C.5. For sites with a farrowing phase, percentage of sites by primary type of waste management system used in the farrowing facility, and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012*	
Primary waste management system	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	6.8	(1.2)	5.4	(1.1)	5.9	(1.0)	1.5	(0.5)
Pit-holding	34.0	(2.6)	34.7	(2.2)	37.2	(2.1)	49.1	(3.6)
Mechanical scraper/ tractor	14.8	(2.0)	13.0	(2.1)	14.0	(1.7)	6.9	(1.2)
Hand cleaned	29.9	(2.8)	23.6	(2.3)	19.1	(1.8)	4.9	(0.9)
Flush—under slats	7.8	(1.2)	15.3	(1.4)	19.9	(1.6)	33.9	(4.2)
Flush—open gutter	3.5	(0.9)	4.4	(1.1)	2.4	(0.7)	2.0	(0.7)
Other	3.3	(0.8)	3.6	(0.9)	1.7	(0.5)	1.5	(0.5)
Total	100.0		100.0		100.0		100.0	

*In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

D. Nursery Phase

1. Facility type

In 2012, over 90 percent of sites with a nursery phase housed pigs in total confinement compared with about 70 percent of sites in 1995, 2000, and 2006.

D.1.a. For sites with a nursery phase, percentage of sites by primary facility type used and by study:

Percent Sites

Study

Primary facility type	Swine 1995 Pct.	Swine 1995 Std. error	Swine 2000 Pct.	Swine 2000 Std. error	Swine 2006 Pct.	Swine 2006 Std. error	Swine 2012* Pct.	Swine 2012* Std. error
Total confinement	68.3	(2.9)	75.9	(2.1)	74.0	(1.7)	91.5	(1.3)
Open building with no outside access	9.6	(1.8)	8.2	(1.3)	10.7	(1.2)	5.4	(1.0)
Open building with outside access	18.3	(2.3)	12.3	(1.7)	11.3	(1.3)	2.5	(0.6)
Lot with hut or no building	3.2	(1.8)	1.7	(0.5)	1.8	(0.5)	0.3	(0.2)
Pasture with hut or no building	0.5	(0.3)	1.9	(0.9)	2.2	(0.6)	0.2	(0.1)
Total	100.0		100.0		100.0		100.0	

*In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

2. Death loss

The percentage of nursery-phase deaths was similar across study years.

D.2.a. Percentage of nursery pigs that died during the nursery phase from December through May, by study:

Percent Nursery Pigs Deaths*

Study							
Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
2.4	(0.1)	2.6	(0.1)	2.9	(0.1)	3.6	(0.5)

*As a percentage of pigs that entered the nursery phase.

A lower percentage of nursery pigs died of an unknown problem in 2006 and 2012 than in 1995 and 2000. Respiratory problems accounted for the highest percentage of nursery deaths in 1995, 2006, and 2012, as reported by producers.

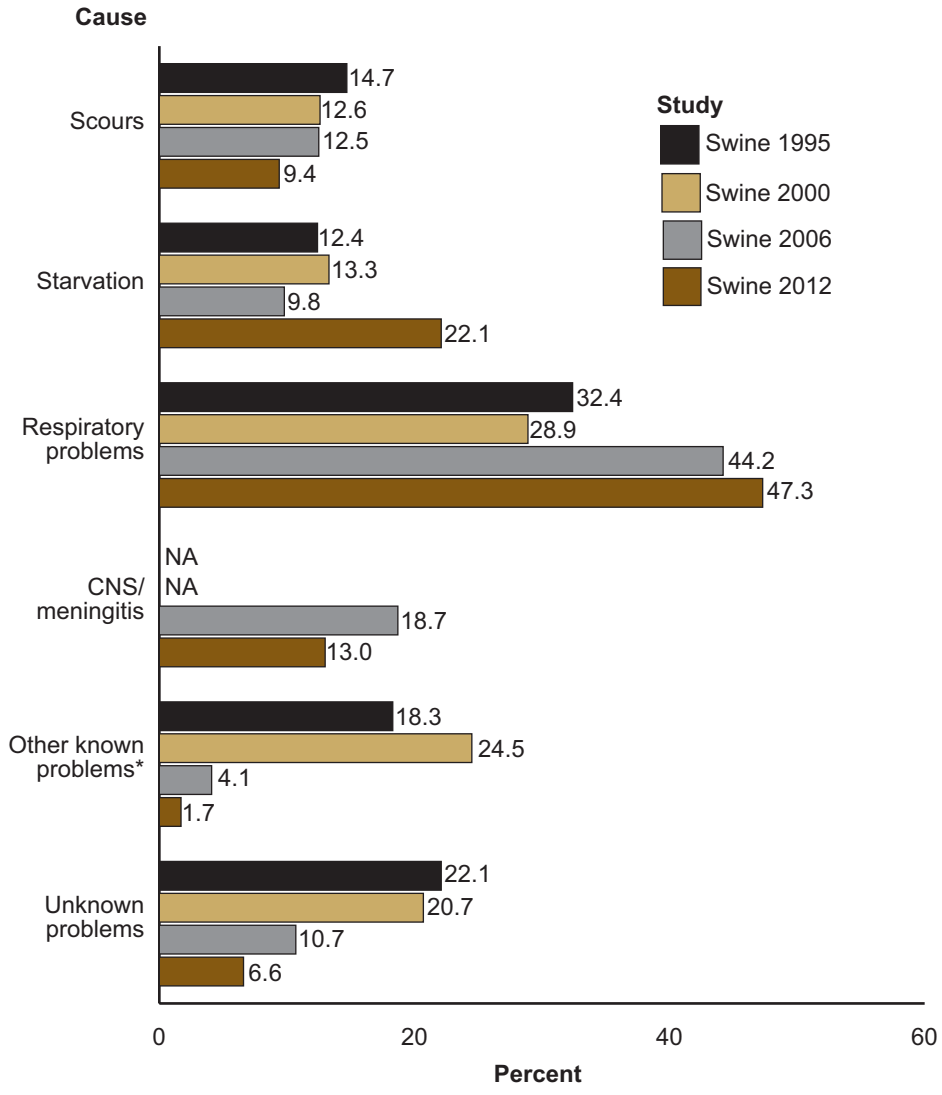
D.2.b. Percentage of nursery pigs that died during the nursery phase from December through May, by producer-identified cause and by study:

Percent Nursery Deaths

	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Cause of death	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Scours	14.7	(1.6)	12.6	(1.2)	12.5	(1.1)	9.4	(1.9)
Starvation	12.4	(1.8)	13.3	(1.1)	9.8	(0.9)	22.1	(6.7)
Respiratory problems	32.4	(2.5)	28.9	(1.7)	44.2	(2.3)	47.3	(6.3)
CNS/meningitis	NA		NA		18.7	(1.9)	13.0	(2.9)
Other known problems*	18.3	(2.7)	24.5	(3.4)	4.1	(0.8)	1.7	(0.9)
Unknown problems	22.1	(2.5)	20.7	(3.5)	10.7	(1.1)	6.6	(2.8)
Total	100.0		100.0		100.0		100.0	

*Includes responses such as unthrifty or multiple causes.

Percentage of nursery pigs that died during the nursery phase from December through May, by producer-identified cause and by study



*Includes responses such as unthrifty or multiple causes.

3. Time spent in the nursery and age when leaving nursery

D.3. Site average age of nursery pigs when leaving the nursery from December through May, by study:

Site Average Age (days)

Study							
Swine 1995*		**Swine 2000**		**Swine 2006**		**Swine 2012**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
61.3	(1.0)	61.8	(0.6)	66.7	(0.6)	67.6	(0.7)

*No time frame for 1995.

4. Pig flow

The use of continuous-flow management for nursery pigs decreased by about 50 percent from 2000 to 2012.

D.4. For sites with a nursery phase, percentage of sites by pig-flow management style and by study:

Percent Sites

Study					
	Swine 2000		**Swine 2006**		**Swine 2012**[1]	
Management style	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Continuous flow	32.3	(2.3)	25.0	(1.7)	15.4	(2.9)
All swine removed without cleaning and disinfecting	3.9	(1.2)	3.6	(0.8)	1.8	(0.4)
All-in/all-out by room[2]	24.4	(1.6)	30.5	(1.6)	31.7	(3.4)
All-in/all-out by building[2]	32.3	(2.1)	29.8	(1.6)	41.2	(3.7)
All-in/all-out by site[2]	3.5	(0.7)	7.1	(1.0)	9.6	(3.0)
Not applicable (no housing)	3.6	(1.1)	4.0	(0.7)	0.3	(0.1)
Total	100.0		100.0		100.0	

[1]In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.
[2]In 2006 and 2012 this response included the phrase “with (room, building, site) cleaned and disinfected.”

5. Waste management

Of sites with a nursery phase, the highest percentage—regardless of study year—used pit-holding as a waste management system in the nursery.

D.4. For sites with a nursery phase, percentage of sites by primary type of waste management system used in the nursery facility, and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012*	
Primary waste management system	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	2.9	(0.9)	5.3	(1.2)	3.7	(0.7)	0.7	(0.3)
Pit-holding	42.2	(2.8)	51.6	(2.3)	51.8	(1.8)	59.3	(4.8)
Mechanical scraper/ tractor	18.4	(2.3)	10.4	(1.6)	13.1	(1.4)	6.2	(1.2)
Hand cleaned	19.4	(2.8)	12.9	(1.8)	11.2	(1.3)	1.4	(0.4)
Flush—under slats	11.0	(1.6)	15.5	(1.3)	17.6	(1.2)	30.4	(5.6)
Flush—open gutter	2.8	(1.0)	2.3	(0.6)	1.2	(0.4)	1.7	(0.6)
Other	3.3	(0.9)	2.0	(0.7)	1.4	(0.4)	0.3	(0.2)
Total	100.0		100.0		100.0		100.0	

*In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

E. Grower/ Finisher Phase

1. Facility type

Over twice the percentage of sites with a grower/finisher phase in 2012 than in 1995 housed grower/finisher pigs in total confinement.

E.1.a. For sites with a grower/finisher phase, percentage of sites by primary facility type used and by study:

Percent Sites

Study

Primary facility type	Swine 1995 Pct.	Swine 1995 Std. error	Swine 2000 Pct.	Swine 2000 Std. error	Swine 2006 Pct.	Swine 2006 Std. error	Swine 2012* Pct.	Swine 2012* Std. error
Total confinement	32.1	(1.9)	42.9	(1.8)	53.2	(1.4)	71.6	(5.8)
Open building with no outside access	11.6	(1.5)	18.2	(1.4)	20.4	(1.2)	22.8	(4.8)
Open building with outside access	44.4	(2.6)	33.2	(2.0)	23.3	(1.4)	4.8	(1.1)
Lot with hut or no building	7.6	(1.9)	4.4	(0.8)	1.8	(0.4)	0.5	(0.2)
Pasture with hut or no building	4.3	(1.2)	1.3	(0.5)	1.3	(0.3)	0.2	(0.1)
Total	100.0		100.0		100.0		100.0	

*In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

2. Death loss

Nearly twice the percentage of pigs died during the grower/finisher phase in 2012 than in 1995. The percentage of grower/finisher deaths due respiratory problems was higher in 2012 than in 2000 or 1995.

E.2.a. Percentage of grower/finisher pigs that died during the grower/finisher phase from December through May, by study:

Percent Grower/Finisher Pigs Deaths*

Study							
Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
2.1	(0.1)	2.9	(0.1)	3.9	(0.2)	4.1	(0.5)

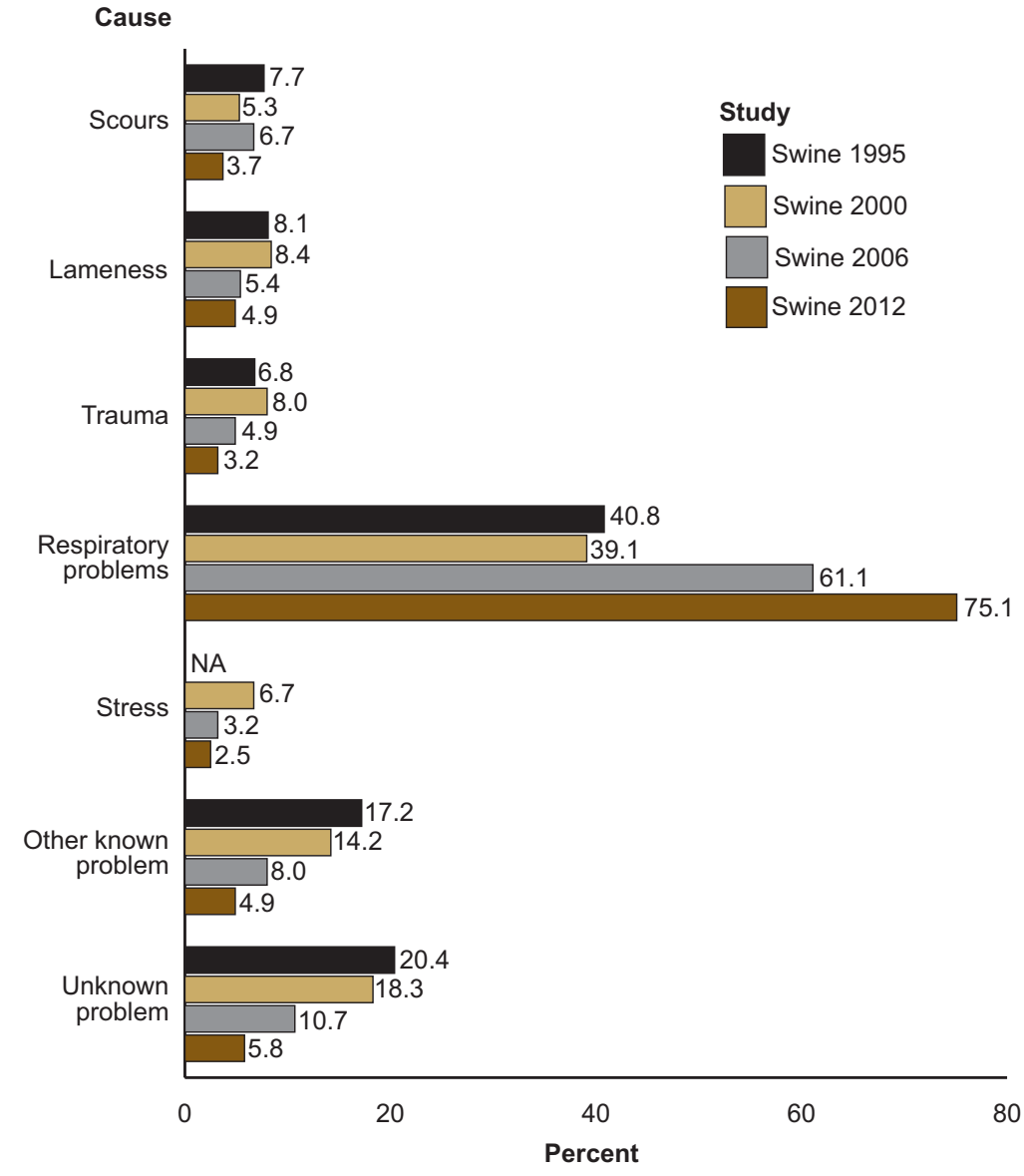
*As a percentage of pigs that entered the grower/finisher phase.

E.2.b. Percentage of grower/finisher deaths from December through May, by producer-identified cause and by study:

Percent Grower/Finisher Deaths

	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Cause	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Scours	7.7	(1.3)	5.3	(2.0)	6.7	(0.6)	3.7	(1.6)
Lameness	8.1	(0.8)	8.4	(0.8)	5.4	(0.3)	4.9	(0.9)
Trauma	6.8	(0.7)	8.0	(0.5)	4.9	(0.4)	3.2	(0.8)
Respiratory problems	40.8	(2.2)	39.1	(2.0)	61.1	(2.3)	75.1	(8.5)
Stress	NA		6.7	(0.6)	3.2	(0.3)	2.5	(0.5)
Other known problem	17.2	(1.9)	14.2	(1.5)	8.0	(3.4)	4.9	(2.8)
Unknown problem	20.4	(1.7)	18.3	(1.4)	10.7	(1.0)	5.8	(2.6)
Total	100.0		100.0		100.0		100.0	

Percentage of grower/finisher deaths from December through May, by producer-identified cause and by study



3. Days to market and age when leaving grower/finisher phase

Pigs spent about a week longer in the grower/finisher phase in 2012 than in 2006.

E.3.a. Site average number of days spent in the grower/finisher phase from December through May, by study:

Site Average Number of Days

Study

Swine 1995*		Swine 2000		Swine 2006		Swine 2012*	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
114.8	(1.3)	116.1	(0.9)	111.1	(0.9)	118.2	(2.2)

*No time frame in 1995.

E.3.b. Site average age of grower/finisher pigs when leaving the grower/finisher phase from December through May, by study:

Site Average Age (days)

Study

Swine 1995		Swine 2000		Swine 2006		Swine 2012*	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
174.9	(1.1)	176.0	(0.8)	177.5	(0.9)	185.9	(2.5)

*No time frame in 1995.

4. Pig flow

From 2000 to 2012, the percentage of grower/finisher sites that used continuous flow management decreased. Interestingly, there was no corresponding increase in the use of all-in/all-out management; however, over half of sites with grower/finisher pigs used all-in/all-out by building in 2012.

E.4. For sites with a grower/finisher phase, percentage of sites by pig-flow management style and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012[1]	
Management style	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Continuous flow	40.5	(2.0)	26.1	(1.3)	10.8	(2.4)
All swine removed without cleaning and disinfecting	3.2	(0.7)	6.2	(0.8)	2.2	(0.6)
All-in/all-out by room[2]	10.7	(0.9)	17.5	(1.2)	13.2	(3.4)
All-in/all-out by building[2]	32.3	(1.7)	35.0	(1.3)	53.6	(9.5)
All-in/all-out by site[2]	10.7	(1.1)	12.1	(1.0)	19.8	(5.9)
Not applicable (no housing)	2.6	(0.7)	3.1	(0.5)	0.5	(0.2)
Total	100.0		100.0		100.0	

[1] In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.
[2]In 2006 and 2012 this response included the phrase “with (room, building, site) cleaned and disinfected.”

5. Waste management

On sites with grower/finisher pigs, pit-holding was the waste management system used by the majority of sites in 2006 and 2012. The percentage of sites that used flush under slats increased from 2000 to 2012.

E.5. For sites with a grower/finisher phase, percentage of sites by primary type of waste management system used in the grower/finisher facility, and by study:

	Percent Sites							
	Study							
	Swine 1995[1]		Swine 2000		Swine 2006		Swine 2012[2]	
Primary waste management system	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
None	8.2	(1.5)	4.2	(0.8)	4.0	(0.6)	1.4	(0.9)
Pit-holding	31.1	(2.1)	47.1	(1.9)	56.0	(1.5)	75.8	(6.2)
Mechanical scraper/tractor	29.5	(2.2)	28.4	(2.0)	21.9	(9.3)	3.6	(0.9)
Hand cleaned	18.8	(2.2)	9.6	(1.3)	6.6	(0.8)	0.8	(0.3)
Flush—under slats	3.8	(0.8)	5.1	(0.4)	7.6	(0.7)	17.0	(5.4)
Flush—open gutter	3.1	(0.6)	2.5	(0.5)	2.4	(0.5)	0.9	(0.4)
Other	5.5	(1.2)	3.1	(0.6)	1.5	(0.3)	0.4	(0.2)
Total	100.0		100.0		100.0		100.0	

[1] Numbers differ from those in Part I of the 1995 study due to differences in estimation.
[2] In 2012, the question referred to the period from December 1, 2011, through May 31, 2012.

6. Source of pigs

Of sites with a grower/finisher phase, the percentage that obtained new finisher pigs from an on-site source (i.e., on-site nursery) in 2012 was less than half the percentage reported in 2000 and 2006. Increased site specialization, corporate ownership of multiple sites, and an increase in sourcing from other sites belonging to the operation might be part of the reason for this decrease.

E.6.a. For sites with a grower/finisher phase, percentage of sites that placed any pigs in the grower/finisher phase from December through May, by source(s) of pigs and by study:

	Percent Sites[1]					
	Study					
	Swine 2000 (12/99–5/00)		Swine 2006 (12/05–5/06)		Swine 2012 (12/11–5/12)	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
On-site	51.4	(1.9)	49.9	(1.5)	19.7	(4.4)
Other sites belonging to this operation	13.1	(1.3)	11.8	(1.0)	65.8	(7.5)
Other sites not belonging to this operation[2]	28.0	(1.6)	38.2	(1.4)	14.2	(3.7)
Auction, sale barn, or livestock market	3.6	(0.1)	1.8	(0.4)	0.6	(0.2)
Other	7.2	(1.2)	0.7	(1.3)	1.1	(0.4)

[1]From December through May of respective year.

[2]In 2000, this referred to producers of feeder pigs (contract/noncontract); in 2006 and 2012, this referred to farm-to-farm, contract/noncontract.

The percentage of sites that obtained grower/finisher pigs from different sources and then commingled them in the same building or area decreased from 2006 to 2012.

E.6.b. For sites that obtained grower/finisher pigs from different sources from December through May, percentage of sites that commingled these pigs in the same building or area, by study:

Percent Sites					
Study					
Swine 2000		Swine 2006*		Swine 2012	
Percent	Std. error	Percent	Std. error	Percent	Std. error
43.2	(4.5)	18.3	(1.8)	22.5	(7.3)

*The question in 2006 asked whether pigs were commingled with existing pigs.

F. Biosecurity

1. Restrictions to entry

From 1995 to 2006, the percentage of sites that allowed business or nonbusiness visitors on-site access decreased from 42.5 percent to 19.0 percent, respectively, but substantially increased to 60.8 percent in 2012.

F.1.a. Percentage of sites that allowed business or nonbusiness visitors on-site access, by study:

Percent Sites							
Study							
Swine 1995*		Swine 2000*		Swine 2006		Swine 2012	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
42.5	(2.4)	34.5	(1.7)	19.0	(1.1)	60.8	(4.9)

*In 1995 and 2000 the question asked if nonemployees were allowed to enter.

The percentage of sites that required nonemployees (business or nonbusiness visitors) to shower before entering the site more than doubled from 2000 to 2012.

F.1.b. For sites that allowed on-site access to business or nonbusiness visitors, percentage of sites by preventive measure(s) required of visitors before entering pig facilities:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Preventive measure	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Shower before entering site	1.9	(0.4)	9.3	(1.2)	9.9	(1.6)	26.5	(5.6)
Change to clean boots and coveralls	NA		52.1	(3.0)	47.8	(3.2)	54.3	(4.6)
Footbath	10.4	(1.7)	NA		NA		NA	
Use the Danish Entry (“Bench”) system	NA		NA		NA		3.5	(1.0)
Wait 24 hr or longer after visiting another or **any other** hog site*	16.6	(2.4)	23.6	(1.9)	32.5	(2.9)	34.7	(4.5)

*In 1995 this was worded as: “Have not been on another pig operation the same day as visiting this operation.”

2. Trucking

Over study years, about 50 to 60 percent of sites allowed trucks or trailers for livestock transport to enter pig areas.

F.2.a. Percentage of sites that allowed trucks or trailers for livestock transport to enter pig areas, by study:

Percent Sites					
Study					
Swine 2000		Swine 2006*		Swine 2012*	
Percent	Std. error	Percent	Std. error	Percent	Std. error
56.8	(1.8)	51.3	(1.4)	59.9	(5.0)

*In 2006 and 2012 the question asked for commercial livestock transporters or animal haulers.

The percentage of sites that required that the trucks' animal area be cleaned and or disinfected decreased from 2006 to 2012.

F.2.b. For sites that allowed trucks or trailers from commercial livestock transporters or animal haulers to enter the pig area, percentage of sites by required practice(s) for cleaning and disinfecting livestock trucks or trailers:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Required practice	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Animal area inside truck be cleaned	65.4	(2.4)	72.3	(1.7)	48.7	(6.4)
Animal area inside truck be disinfected	47.0	(2.3)	60.5	(1.8)	43.0	(6.9)
Outside of truck be cleaned	54.4	(2.3)	59.7	(1.8)	42.6	(6.9)
Outside of truck be disinfected	33.8	(2.0)	44.8	(1.8)	38.0	(7.5)

3. Proximity to other swine sites

A higher percentage of sites in 2012 than in 1995, 2000, and 2006 were 1 to 2.99 miles away from another swine site or operation. For all study years, over 80 percent of sites were less than 3 miles from another swine site.

F.3. Percentage of sites by distance (in miles) to the nearest known swine site or operation, and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Distance* (mi)	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Less than 0.50	32.7	(2.0)	28.3	(1.6)	29.6	(1.3)	20.6	(4.4)
0.50–0.99	27.4	(2.3)	25.6	(1.6)	23.2	(1.1)	27.1	(3.0)
1.00–2.99	25.5	(2.2)	27.9	(1.5)	27.5	(1.2)	41.0	(3.2)
3.00–4.99	7.9	(1.5)	9.3	(0.9)	10.4	(0.8)	3.3	(0.6)
5.00 or more	6.5	(0.9)	8.9	(0.9)	9.3	(0.7)	7.9	(1.2)
Total	100.0		100.0		100.0		100.0	

*In 1995 and 2000, the question asked for the distance to the nearest 0.1 mile. In 2006 and 2012, the question asked for the distance to the nearest 0.25 mile.

4. Rodent control

Less than half the percentage of sites in 2012 than in 1995 used cats to control rodents. Across study years, the majority of sites used bait or poison to control rodents.

F.4. Percentage of sites by rodent control method used and by study:

	Percent Sites							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Control method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Cats	68.7	(2.1)	60.6	(1.7)	51.2	(1.3)	30.4	(4.7)
Dogs	NA		33.9	(1.8)	26.3	(1.2)	19.8	(4.0)
Traps	15.9	(1.6)	19.6	(1.5)	20.5	(1.1)	21.4	(3.2)
Bait or poison	85.1	(2.1)	88.5	(1.3)	87.9	(0.9)	95.0	(0.8)
Exterminator	NA		4.4	(0.5)	5.4	(0.5)	9.2	(2.2)
Other	9.5	(1.8)	2.6	(0.9)	1.8	(0.4)	4.2	(2.4)
Any	98.1	(0.7)	99.0	(0.3)	97.3	(0.5)	99.4	(0.2)

G. General Management

1. Environmental testing

In 2012, the average number of times that manure was tested for nutrients was more than double that reported in previous study years.

G.1. Average number of times the following environmental tests were conducted during the previous 3 years, by test type and by study:

	Site Average Number of Tests Conducted							
	Study							
	Swine 1995		Swine 2000		Swine 2006		Swine 2012	
Test type	Avg. no.	Std. error	Avg. no.	Std. error	Avg. no.	Std. error	Avg. no.	Std. error
Groundwater (such as for nitrates or pathogens)	0.6	(0.1)	0.7	(0.0)	0.8	(0.1)	0.8	(0.2)
Nutrient content of manure (such as nitrogen level)	0.6	(0.1)	1.2	(0.1)	1.8	(0.1)	4.2	(0.5)
Air quality (such as ammonia or hydrogen sulfide levels)	0.6	(0.1)	0.2	(0.0)	0.2	(0.1)	0.2	(0.0)

2. Carcass disposal

The percentage of sites that buried preweaned-pig carcasses on-site decreased from 1995 to 2012, while the percentage of sites that composted preweaned-pig carcasses on-site increased.

G.2.a. Percentage of sites by method(s) used to dispose of preweaned-pig carcasses, and by study:

	Percent Sites							
	Study							
	Swine 1995[2]		Swine 2000[3]		Swine 2006[4]		Swine 2012[5]	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Burial on-site	48.7	(2.9)	45.3	(2.6)	31.9	(2.1)	22.8	(2.0)
Burning on-site	14.2	(1.8)	15.4	(1.7)	15.2	(1.5)	10.3	(1.9)
Renderer pickup on-site	15.4	(1.7)	17.2	(2.0)	12.5	(1.5)	13.4	(3.7)
Renderer pickup outside site	2.6	(0.5)	4.8	(0.8)	4.0	(0.9)	6.4	(1.0)
Composting on-site[1]	13.2	(1.6)	23.2	(2.1)	37.2	(2.2)	45.9	(2.8)
Composting off-site	NA		NA		NA		4.6	(1.0)
Other	5.6	(1.2)	4.4	(1.1)	3.1	(0.7)	1.8	(0.4)

[1]The 1995 question was “Composting on farm” and the 2000 question was “Composting.”
[2]Sites with preweaned pigs that died from December 1, 1994, through May 31, 1995.
[3]Sites with preweaned pigs that died on this site/operation from December 1, 1999, through May 31, 2000.
[4]Sites with preweaned pigs that died on this site from December 1, 2005, through May 31, 2006.
[5]Sites with preweaned pigs that died on this site from December 1, 2011, through May 31, 2012.

As with preweaned-pig carcasses, the percentage of sites that buried weaned-pig carcasses on-site decreased from 1995 to 2012, while the percentage of sites that composted weaned-pig carcasses on-site increased.

G.2.b. Percentage of sites by method(s) used to dispose of weaned- and older-pig carcasses, and by study:

Percent Sites

Study

	Swine 1995[2]		Swine 2000[3]		Swine 2006[4]		Swine 2012[5]	
Method	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Burial on-site	39.3	(2.7)	37.8	(1.8)	25.1	(1.2)	10.4	(1.5)
Burning on-site	8.9	(1.3)	11.6	(1.2)	12.2	(0.9)	5.1	(1.1)
Renderer pickup on-site	34.5	(2.2)	34.4	(1.7)	26.3	(1.3)	27.9	(5.0)
Renderer pickup outside site	10.2	(1.3)	11.1	(1.1)	10.9	(0.9)	11.1	(2.0)
Composting on-site[1]	7.2	(1.3)	18.0	(1.3)	33.8	(1.3)	39.8	(7.2)
Composting off-site	NA		NA		NA		5.4	(1.0)
Other	3.1	(0.8)	2.5	(0.5)	2.3	(0.4)	1.2	(0.4)

[1]The 1995 question was “Composting on farm” and the 2000 question was “Composting.”
[2]Sites with preweaned pigs that died from December 1, 1994, through May 31, 1995.
[3]Sites with preweaned pigs that died on this site/operation from December 1, 1999, through May 31, 2000.
[4]Sites with preweaned pigs that died on this site/operation from December 1, 2005, through May 31, 2006.
[5]Sites with preweaned pigs that died on this site from December 1, 2011, through May 31, 2012.

3. Use of a veterinarian

The percentage of sites that used a local veterinary practitioner was lower in 2012 than in 2000, while the percentage of sites that used an on-staff veterinarian increased from 2000 to 2012.

G.3. Percentage of sites in which a veterinarian had visited for any purpose during the 12 months before the study interview, by type of veterinarian and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Type of veterinarian	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Local private practitioner	66.9	(1.5)	49.5	(1.4)	45.9	(4.2)
Consulting or second opinion	10.5	(0.9)	11.9	(1.0)	15.9	(3.5)
On-staff	9.9	(0.8)	18.0	(0.9)	28.2	(4.9)
State or Federal	7.6	(1.0)	1.2	(0.4)	0.7	(0.2)
Other type	1.8	(0.4)	1.2	(0.4)	0.9	(0.3)
Any type	78.1	(1.3)	69.1	(1.3)	75.3	(4.8)

Section III: Health Status Changes in the U.S. Swine Industry, NAHMS Population Estimates—2000, 2006, and 2012

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

A. Breeding Females and Preweaned Pig Morbidity

1. Breeding females

Gastric ulcers have remained a problem in breeding females at nearly equivalent levels across study years. The percentage of sites with respiratory disease (PRRS, *Mycoplasma*, and influenza) in breeding females increased from 2000 to 2012.

A.1. Percentage of sites in which the following disease problems were known or suspected in one or more breeding females during the 12 months before the study interview, by study:

	Percent Sites*					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Actinobacillus pleuropneumonia (APP)	3.4	(0.8)	4.2	(1.9)	0.9	(0.5)
Porcine reproductive and respiratory syndrome (PRRS)	21.4	(3.1)	27.3	(4.3)	44.5	(4.6)
Mycoplasma pneumonia	14.2	(2.2)	17.0	(3.2)	31.2	(4.7)
Influenza	12.1	(2.0)	22.3	(3.9)	25.5	(4.3)
Salmonella	2.3	(0.7)	6.1	(2.5)	2.6	(1.3)
Swine dysentery	1.3	(0.5)	1.7	(1.4)	5.9	(2.6)
Transmissible gastroenteritis (TGE)	2.4	(0.7)	2.0	(1.5)	0.5	(0.4)
Gastric ulcers	10.7	(2.1)	17.8	(3.1)	10.7	(3.0)
Ileitis (*Lawsonia intracellularis*)	NA		16.2	(3.3)	18.7	(3.8)
Leptospirosis	3.2	(0.8)	5.5	(1.8)	1.6	(1.2)
Parvovirus	4.4	(0.9)	5.0	(1.9)	4.5	(1.7)
Erysipelas	6.8	(1.5)	7.1	(2.9)	4.1	(1.4)
Glasser's disease (*Haemophilus parasuis*)	3.7	(1.0)	5.0	(1.4)	8.3	(2.5)
Roundworms	40.8	(4.7)	26.8	(4.1)	39.1	(5.1)
Other	9.1	(2.2)	6.4	(2.3)	1.5	(1.0)

*This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis. Question variations: **2000**-"In the last 12 months, were any of the following disease problems present in one or more breeding females while in the breeding herd?" **2006-"**In the last 12 months, were any of the following disease problems known or suspected to have caused sickness or mortality in one or more females in the breeding herd?" **2012-"**During the last 12 months, were the following disease problems present in breeding females?"

2. Preweaned pigs

The 2012 study marked the first time that no sites reported TGE problems in any preweaned pigs. Problems with PRRS in preweaned pigs, however, increased from 2000 to 2012.

A.2. Percentage of sites in which the following disease problems were known or suspected in one or more preweaned pigs during the 12 months before the study interview, by study:

	Percent Sites*					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
PRRS	10.7	(2.3)	13.3	(2.9)	33.0	(4.6)
Undifferentiated pneumonia	NA		25.0	(3.8)	21.9	(3.5)
TGE	3.2	(0.9)	2.1	(1.5)	0.0	(—)
Rotavirus	5.7	(1.3)	6.9	(1.7)	19.4	(6.2)
E. coli (colibacillosis)	45.2	(4.8)	47.4	(4.6)	47.8	(5.5)
Coccidiosis	8.6	(1.7)	10.6	(2.6)	12.9	(3.0)
Clostridium	9.0	(1.7)	16.2	(2.8)	29.6	(4.6)
Streptococcus suis	29.8	(4.3)	38.5	(4.4)	46.9	(4.7)
Greasy pig disease	25.9	(3.4)	27.6	(4.0)	39.8	(4.7)
Navel infections	NA		43.1	(4.3)	60.6	(5.0)
Other	5.7	(2.0)	9.5	(3.2)	3.9	(1.4)

*This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis. Question variation: **2000**-"In the last 12 months, were any of the following disease problems present in one or more preweaned (suckling) pigs?" **2006**-"In the last 12 months, were any of the following disease problems known or suspected to have caused sickness or mortality in one or more preweaned (suckling) pigs?" **2012**- "During the last 12 months, were the following disease problems present in preweaned (suckling) pigs?"

B. Disease Prevention in Breeding Females

1. Porcine reproductive and respiratory syndrome (PRRS)

A higher percentage of sites in 2012 than in 2006 usually vaccinated breeding females against PRRS.

B.1.a. Percentage of sites that usually vaccinated breeding females against PRRS, by study:

Percent Sites					
Study					
Swine 2000		Swine 2006		Swine 2012	
Percent	Std. error	Percent	Std. error	Percent	Std. error
37.1	(4.7)	27.3	(3.9)	46.4	(5.6)

B.1.b. For sites that vaccinated breeding females against PRRS, percentage of sites that usually vaccinated during the following reproductive periods, by study:

	Percent Sites							
	Swine 2000		Swine 2000*		Swine 2006		Swine 2012	
Period	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Prior to entering breeding herd	10.0	(1.9)	27.0	(5.5)	38.1	(8.4)	30.4	(4.3)
As gilts when entering breeding herd	29.9	(4.6)	80.8	(5.4)	69.2	(7.9)	34.0	(4.7)
During gestation up to 4 weeks before farrowing	4.9	(1.2)	13.3	(3.4)	10.9	(4.5)	10.0	(2.8)
During the last 4 weeks of gestation	6.5	(2.0)	17.5	(5.3)	3.5	(1.9)	10.0	(3.2)
From farrowing to weaning	15.9	(4.5)	43.0	(8.7)	6.8	(3.5)	4.1	(1.8)
After weaning through breeding/mating	8.7	(2.3)	23.4	(6.0)	28.2	(8.7)	7.8	(2.5)
At regular intervals, regardless of reproductive stage	3.4	(1.1)	9.1	(3.1)	47.0	(8.6)	27.3	(4.7)
In response to a PRRS outbreak	NA		NA		NA		17.9	(3.0)

*In 2000, estimates were based on all operations (column to the left), while in 2006 and 2012 estimates were based on only operations that vaccinated against PRRS. For comparison purposes, the percentages in this column reflect operations in 2000 that vaccinated breeding females against PRRS.

Of sites that usually vaccinated breeding females against PRRS, the percentage that used a commercial/noncommercial modified live or killed PRRS vaccine decreased from 95.3 percent of sites in 2000 to 52.4 percent in 2012.

B.1.c. For sites that usually vaccinated breeding females against PRRS, percentage of sites by type of PRRS vaccine used during the 6 months (2000) or 12 months (2006 and 2012) before the study interview, by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006[1]		Swine 2012	
PRRS vaccine type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Commercial/noncommercial modified-live or killed PRRS vaccine[2]	95.3	(4.8)	72.5	(7.0)	52.4	(7.5)
Autogenous PRRS vaccine	3.3	(1.1)	30.6	(7.7)	37.0	(8.5)

[1]Different numbers from Part II report for that year due to differences in estimation.
[2]In 2000 the vaccine was not necessarily “commercial.”

2. Influenza A virus in swine

Close to half of sites vaccinated breeding females against influenza in 2012 compared with about 14 percent in 2000.

B.2.a. Percentage of sites that usually vaccinated breeding females against influenza, by study:

Percent Sites					
Study					
Swine 2000		Swine 2006		Swine 2012	
Percent	Std. error	Percent	Std. error	Percent	Std. error
14.2	(2.2)	29.3	(3.9)	46.4	(5.6)

From 2000 to 2012, a similar percentage of sites vaccinated breeding females against influenza during the last 4 weeks of gestation.

B.2.b. For sites that vaccinated breeding females against influenza, percentage of sites that usually vaccinated during the following reproductive periods, by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Period	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Prior to entering the breeding herd	37.7	(6.5)	62.9	(7.1)	33.1	(6.2)
As gilts at time of entering the breeding herd	75.6	(5.5)	70.1	(6.5)	36.6	(5.8)
During gestation up to 4 weeks *before* farrowing	27.4	(5.9)	32.5	(7.4)	17.2	(4.0)
During the last 4 weeks of gestation	38.8	(7.2)	24.7	(6.1)	26.6	(6.2)
From farrowing to weaning	27.2	(7.4)	4.0	(2.2)	2.2	(1.4)
After weaning through breeding/mating	9.9	(4.3)	8.2	(4.2)	1.6	(0.9)
At regular intervals, regardless of reproductive stage*	12.1	(3.7)	20.5	(5.8)	11.4	(5.6)

*In 2000 the wording was “once or twice a year, regardless of reproductive stage.”

The percentages of sites that used a commercial killed vaccine and the percentages that used an autogenous killed vaccine have remained relatively steady across study years.

B.2.c. For sites that usually vaccinated breeding females against influenza, percentage of sites by type of influenza vaccine used during the 6 months (2000) or 12 months (2006 and 2012) before the study interview, and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Influenza vaccine type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Commercial killed vaccine*	93.8	(2.0)	82.1	(5.6)	73.7	(6.1)
Autogenous killed vaccine	31.7	(8.0)	23.7	(6.5)	47.1	(9.9)

*In 2000 the vaccine was not necessarily “commercial.”

C. Use of Antimicrobials in Breeding Females to Treat Disease Conditions

The percentage of sites that used antibiotics to treat breeding females for disease has not changed substantially from 2000 to 2012.

C. Percentage of sites that gave antibiotics to any breeding females to treat a disease condition during the 12 months before the study interview, by study:

Percent Sites					
Study					
Swine 2000		Swine 2006		Swine 2012	
Percent	Std. error	Percent	Std. error	Percent	Std. error
61.3	(4.9)	74.1	(3.9)	59.5	(5.3)

D. Weaned Pig Morbidity

1. Nursery pigs

Some diseases that affect nursery pigs, such as *E. coli* diarrhea, were present in similar percentages of sites across study years. The percentage of sites with influenza and *Streptococcus suis* problems, however, increased substantially from 2000 to 2012. Nearly half of sites with nursery pigs were affected by PRRS in 2012.

D.1. Percentage of sites in which the following disease problems were known or suspected in one or more nursery pigs during the 12 months before the study interview, by study:

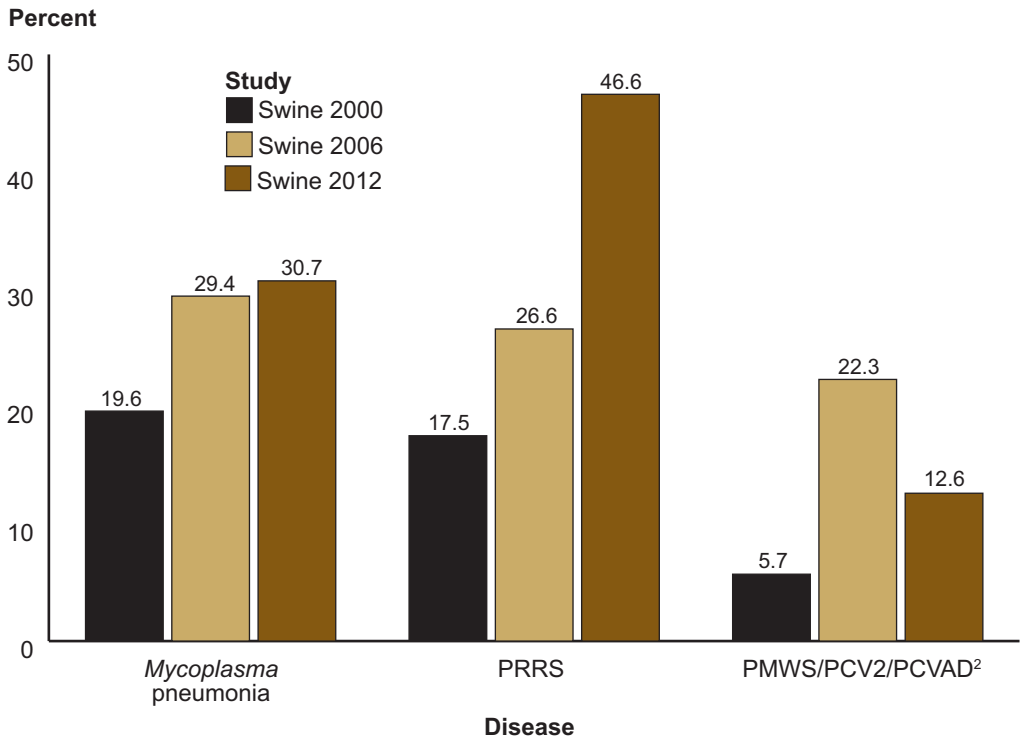
	Percent Sites[1]					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
APP	6.4	(1.2)	2.9	(0.8)	2.3	(1.2)
Glasser's disease	7.3	(1.2)	17.4	(3.0)	24.3	(9.2)
Mycoplasma pneumonia	19.6	(2.4)	29.4	(3.8)	30.7	(6.0)
Influenza	7.5	(1.4)	24.6	(3.9)	46.2	(4.8)
PRRS	17.5	(3.4)	26.6	(3.5)	46.6	(7.6)
Salmonella	6.6	(1.2)	8.9	(2.4)	6.7	(2.0)
Swine dysentery	3.2	(1.0)	4.8	(2.0)	6.5	(2.3)
TGE	1.0	(0.4)	1.8	(1.2)	0.0	(—)
E. coli diarrhea[2]	24.0	(4.2)	31.8	(4.0)	32.4	(4.3)
Other diarrhea	NA		20.7	(3.2)	15.2	(3.0)
Edema disease (*E. coli*)	6.1	(1.7)	9.0	(2.6)	6.1	(1.8)
PMWS/PCV2/PCVAD[3]	5.7	(1.3)	22.3	(3.2)	12.6	(2.7)
Porcine dermatitis and nephropathy syndrome (PDNS)	NA		2.9	(1.3)	1.4	(0.1)
Greasy pig disease	25.3	(3.2)	27.5	(3.5)	33.5	(4.2)
Streptococcus suis	31.6	(3.5)	49.9	(4.2)	65.2	(5.8)
Roundworms	18.0	(3.2)	15.8	(3.1)	10.2	(2.9)
Lice	NA		10.8	(2.7)	5.9	(2.2)
Other	3.9	(0.9)	10.5	(2.7)	5.3	(2.1)

[1]This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

[2]In 2000 was "Other *E. coli* diarrhea."

[3]All are variations of PCVAD caused by porcine circovirus 2 (PCV2) and previously known only as postweaning multisystemic wasting syndrome (PMWS).

Percentage of sites[1] in which the following disease problems were known or suspected in one or more nursery pigs during the 12 months before the study interview, by study



[1]This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

[2]All are variations of PCVAD caused by porcine circovirus 2 (PCV2) and previously known only as postweaning multisystemic wasting syndrome (PMWS).

2. Grower/finisher pigs

As with nursery pigs, the percentage of sites with influenza problems in grower/finisher pigs increased from 2000 to 2012. The percentage of sites with problems with PCVAD increased from 2000 to 2006 but decreased from 2006 to 2012.

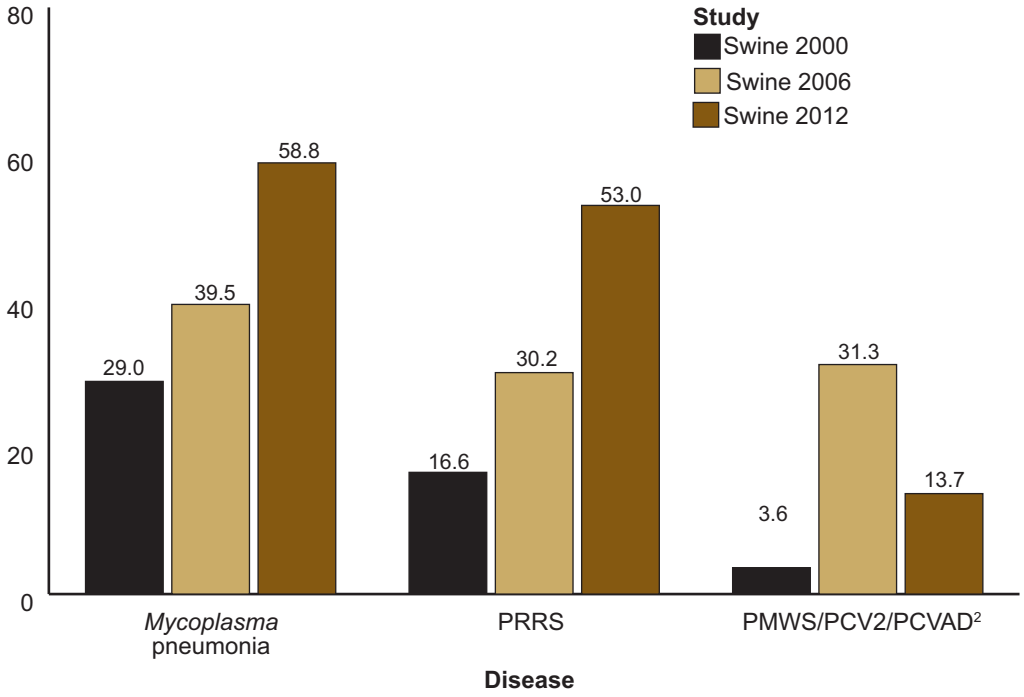
D.2. Percentage of sites in which the following disease problems were known or suspected in one or more grower/finisher pigs during the 12 months before the study interview, by study:

	Percent Sites[1]					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
APP	8.1	(1.3)	8.5	(1.8)	4.3	(2.7)
Glasser's disease	5.4	(1.4)	18.7	(2.9)	29.4	(7.1)
Mycoplasma pneumonia	29.0	(3.1)	39.5	(3.5)	58.8	(6.6)
Influenza	34.3	(4.1)	36.4	(3.6)	59.4	(5.3)
PRRS	16.6	(3.0)	30.2	(3.2)	53.0	(6.6)
Salmonella	8.4	(1.4)	12.0	(2.5)	5.6	(2.1)
Atrophic rhinitis	14.0	(2.1)	5.7	(1.3)	5.9	(2.5)
Swine dysentery	1.7	(0.5)	2.8	(0.9)	4.3	(1.5)
Hemorrhagic bowel syndrome	18.4	(2.7)	36.5	(3.5)	32.7	(7.8)
Ileitis	36.9	(3.8)	41.7	(3.6)	28.7	(5.0)
Gastric ulcers	19.3	(2.5)	28.3	(3.0)	28.4	(5.5)
Erysipelas	4.1	(1.3)	4.0	(1.2)	2.7	(1.3)
PMWS/PCV2/PCVAD[2]	3.6	(0.7)	31.3	(3.3)	13.7	(3.5)
PDNS	NA		6.0	(1.3)	2.1	(1.4)
Roundworms	19.6	(2.9)	15.5	(2.8)	8.8	(2.1)
Mange	NA		8.2	(2.6)	4.4	(1.4)
Other	7.5	(2.0)	14.0	(2.2)	4.0	(1.4)

[1]This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

[2]All are variations of PCVAD caused by PCV2 and previously known only as postweaning multisystemic wasting syndrome (PMWS).

Percentage of sites[1] in which the following disease problems were known or suspected in one or more grower/finisher pigs during the 12 months before the study interview



[1]This table reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

[2]All are variations of PCVAD caused by PCV2 and previously known only as postweaning multisystemic wasting syndrome (PMWS).

E. Disease Prevention in Weaned Pigs—Vaccination

In 2012, nearly all sites with nursery and grower/finisher pigs vaccinated pigs against *Mycoplasma* and influenza, a large percentage increase from previous study years.

E.1.a. Percentage of sites that usually vaccinated weaned pigs (nursery and grower/finisher) against the following diseases during the 12 months before the study interview, by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012*	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Mycoplasma pneumonia	40.9	(3.6)	58.0	(4.2)	99.9	(3.1)
PRRS	5.2	(1.1)	10.1	(2.9)	40.3	(5.9)
Influenza	6.2	(1.1)	17.8	(3.0)	92.6	(4.7)

*Since the 2000 and 2006 studies did not include data on wean-to-finish sites and the 2012 study did, data on wean-to-finish sites were excluded from the 2012 estimates for comparison purposes.

In 2012, all sites that vaccinated pigs against influenza used an autogenous killed vaccine, and nearly all sites also used a commercial killed vaccine.

E.1.b. For sites that usually vaccinated weaned pigs against influenza, percentage of sites by type of influenza vaccine used during the 6 months (2000) or 12 months (2006 and 2012) before the study interview, by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012*	
Vaccine type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Commercial killed vaccine	91.1	(3.4)	98.7	(1.3)	94.2	(5.8)
Autogenous killed vaccine	34.3	(9.7)	58.3	(17.9)	100.0	(0.0)

*Excluded wean-to-finish pigs from this calculation to maintain greater comparability with previous years.

F. Use of Antimicrobials in Weaned Pigs

In 2012, nearly half of sites treated all nursery pigs with antibiotics, including clinically ill pigs, in the same airspace.

F.1.a. Percentage of sites by action taken during the most recent occurrence of respiratory disease in nursery pigs, and by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Action	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Did not treat any pigs with antibiotics	11.7	(4.6)	2.9	(1.2)	5.8	(2.3)
Treated only clinically ill pigs with antibiotics	16.0	(2.5)	23.4	(3.6)	18.0	(3.9)
Treated all pigs in same pen with clinically ill pigs with antibiotics	6.0	(2.2)	1.0	(0.9)	0.9	(0.5)
Treated all pigs in same pen and pens adjacent to clinically ill pigs with antibiotics	6.2	(3.3)	0.2	(0.1)	4.6	(4.1)
Treated all pigs in entire room with clinically ill pigs with antibiotics (all pigs with shared airspace)	31.3	(3.5)	39.6	(4.0)	49.6	(7.5)
Haven't had clinical respiratory disease in nursery pigs in last 12 mo (2 yr in 2000)	28.8	(3.7)	32.9	(4.2)	21.1	(4.3)
Total	100.0		100.0		100.0	

In 2012, a higher percentage of sites with respiratory disease in grower/finisher pigs treated pigs with antibiotics in the same room compared with sites in previous study years. In addition, a lower percentage of sites in 2012 than in 2006 had no respiratory disease.

F.1.b. Percentage of sites by action taken during the most recent occurrence of respiratory disease in grower/finisher pigs, by study:

	Percent Sites					
	Study					
	Swine 2000		Swine 2006		Swine 2012	
Action	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Did not treat any pigs with antibiotics	6.5	(2.7)	4.3	(1.5)	2.4	(1.1)
Treated only clinically ill pigs with antibiotics	27.1	(4.4)	27.3	(3.2)	23.1	(5.4)
Treated all pigs in same pen with clinically ill pigs with antibiotics	7.1	(1.7)	2.9	(1.2)	1.4	(0.7)
Treated all pigs in same pen and pens adjacent to clinically ill pigs with antibiotics	3.4	(1.0)	2.1	(1.1)	1.1	(0.7)
Treated all pigs in entire room with clinically ill pigs with antibiotics (all pigs with shared airspace)	39.5	(3.6)	43.3	(3.6)	63.3	(6.3)
Haven't had clinical respiratory disease in grower/finisher pigs in last 12 mo (2 yr in 2000)	16.4	(2.7)	20.1	(2.9)	8.6	(2.0)
Total	100.0		100.0		100.0	

A higher percentage of sites in 2012 than in 2006 gave nursery pigs any antimicrobials in feed or water for any reason during the 6 months before the study interview.

F.1.c. Percentage of sites that gave nursery and/or grower/finisher pigs any antimicrobials in feed or water for any reason during the 6 months before the study interview, by production type and by study:

	Percent Sites							
	Water*				Feed*			
	Study							
	Swine 2006		Swine 2012		Swine 2006		Swine 2012	
Production type	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Nursery	34.9	(3.9)	66.6	(5.5)	80.2	(3.3)	89.4	(3.0)
Grower/finisher	47.5	(3.6)	74.3	(4.8)	80.2	(2.6)	91.2	(2.0)

*Does not match previous estimates because of elimination of “Other” category.

Appendix: Study Objectives and Related Outputs

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.

- "Part I: Baseline Reference of Swine Health and Management, 2012"
  "Part II: Reference of Swine Health and Health Management in the United States, 2012"
- "Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012"

2. Describe trends in swine health and management practices.

- "Part III: Changes in the U.S. Pork Industry, 1995–2012"

3. Determine the prevalence and associated risk factors for select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in weaned market pigs.

- *Salmonella*, info sheet
- Commensal *Enterococcus* on U.S. Swine Sites: Prevalence and Antimicrobial Drug Susceptibility, info sheet
- *E. coli* on U.S. Swine Sites: Prevalence and Antimicrobial Drug Susceptibility, info sheet

4. Describe antibiotic usage patterns in pigs postweaning to market to control and treat disease and promote growth.

- "Part II: Reference of Swine Health and Health Management in the United States, 2012"

5. Evaluate presence of or exposure to select pathogens and characterize isolated organisms from biological specimens (feces, sera, feed).

- *Salmonella*, info sheet
- Commensal *Enterococcus* on U.S. Swine Sites: Prevalence and Antimicrobial Drug Susceptibility, info sheet
- *E. coli* on U.S. Swine Sites: Prevalence and Antimicrobial Drug Susceptibility, 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.

- "Part I: Baseline Reference of Swine Health and Management, 2012"
- "Part II: Reference of Swine Health and Health Management in the United States, 2012"