United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Veterinary
Services

National
Animal Health
Monitoring
System

February 2016

(Revised
February 2020)

Swine 2012

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

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Items of Note

This report was updated in February 2020. Specifically, it was discovered that two different tables (D.8.a. and D.8.b.) had identical estimates. This error was rectified by re-examining the data and populating the tables with the correct estimates. It also was discovered that the estimates in table D.8.c. reflected the farthest distance of shipments when they should have reflected the closest distance. This error was rectified by placing the estimates in table D.8.c. in Table D.8.b. and recalculating estimates for table D.8.c.

To verify that these errors were isolated incidences, shipment tables in sections C.8 and E.7 were checked for accuracy. Both sections contained minor errors, which are noted below. Two tables, C.8.d and D.8.d, were added to provide clarification to tables C.8.e and D.8.e, respectively.

All available publications that cited this report were indexed, and the specific tables cited in those publications were investigated for errors. Additionally, all tables related to antibiotics (sections B.7, C.6, D.6, E.5) were checked for accuracy. This additional investigation resulted in the remainder of the corrections listed below:

- Table B.4.a: The standard error was changed from (0.0) to (—) for one estimate.
- Table C.1.b: The table title and column headers were updated for clarification.
- Table C.8.a: The standard error was changed from (0.0) to (—) for one estimate.
- Table C.8.d: This is a new table. Table C.8.d in the previous version of this publication is now table C.8.e.
- Table C.8.e: In the previous version of this publication, this was table C.8.d. The table title was updated for clarification.
- Table D.1.b: The table title and column headers have been updated for clarification.
- Table D.8.b: All estimates have been updated.
- Table D.8.c: All estimates have been updated.
- Table D.8.d: This is a new table. Table D.8.d in the previous version of this publication is now table D.8.e.
- Table D.8.e: In the previous version of this publication, this was table D.8.d. The table title was updated for clarification. Five estimates were removed due to confidentiality concerns. The standard error was changed from (0.0) to (—) for one estimate.
- Table E.1.b: All estimates were updated. The table title and column headers were updated for clarification.
- Table E.5.c: Three estimates were removed due to confidentiality concerns.
- Table E.5.f: One estimate was removed due to confidentiality concerns.
- Table E.7: The table was corrected.

Population

The USDA's National Animal Health Monitoring System (NAHMS) Swine 2012 study updates national estimates on the health and health management of U.S. swine previously collected during the NAHMS Swine 2006 study. One component of the Swine 2012 study was conducted in 13 States on operations with 100 or more swine in total inventory on June 1, 2012. This report provides national estimates for this population, which includes swine production sites of all types. Two-thirds of sites (66.8 percent) had a grower/finisher unit. Almost one-fourth of sites (23.5 percent) had a breeding herd with gestation and farrowing.

Breeding herd

The three disease problems reported by the highest percentages of large sites were porcine reproductive and respiratory syndrome (PRRS), *Mycoplasma* pneumonia, and influenza. The top three disease problems in suckling pigs, regardless of herd size, were navel infections, colibacillosis, and *Streptococcus suis*.

The three vaccines administered to breeding females by the highest percentages of breeding herds, regardless of size, were leptospirosis, erysipelas, and parvo. Over three-fourths of large breeding herds also vaccinated for influenza, *Mycoplasma hyopneumoniae*, and porcine circovirus type 2.

Regarding PRRS herd classification, less than one-tenth of large breeding herds had an unknown PRRS status compared with more than half of small herds. Over one-tenth of medium and large breeding herds were PRRS positive unstable, half of large breeding herds were positive stable, and over one-fifth of all breeding herds were known negative.

Nursery phase

In nursery pigs, the top three disease problems reported by the highest percentages of sites, regardless of size, were *Streptococcus suis*, PRRS, and influenza. A majority of nursery sites vaccinated nursery pigs for porcine circovirus 2 and *Mycoplasma hyopneumoniae*.

Over 80 percent of nursery sites had administered **injectable** antibiotics to one or more nursery pigs during the previous 6 months. Almost two-thirds of nursery sites used injectable antibiotics to treat respiratory disease. Two-thirds of nursery sites had administered **water**-soluble antibiotics to nursery pigs for 1 or more days during the previous 6 months. Over 40 percent of nursery sites used water-soluble antibiotics to treat respiratory disease. Almost 90 percent of nursery sites had administered **feed** antibiotics to nursery pigs for 1 or more days during the previous 6 months.

Almost 70 percent of nursery sites used feed antibiotics to prevent disease and control disease spread.

More than 40 percent of all nursery sites included distiller's dried grain and solubles (DDGS) in at least one nursery diet. This percentage was similar across all size groups. On average, DDGS made up 13.4 percent of the nursery diet on nursery sites using DDGS. Spray-dried plasma, blood meal, and other blood products were used in nursery diets on more than 70 percent of large nursery sites.

Grower/finisher phase

More than half of grower/finisher sites reported problems with influenza, PRRS, and *Mycoplasma*. Over one-fourth of grower/finisher sites reported problems with ileitis, gastric ulcers, and hemorrhagic bowel syndrome. More than half of large grower/finisher sites vaccinated pigs for PCV2 and *Mycoplasma hyopneumoniae*. On the 20.8 percent of grower/finisher sites that vaccinated pigs against influenza, almost 100 percent of grower/finisher pigs received an autogenous influenza vaccine.

Over 80 percent of grower/finisher sites had administered **injectable** antibiotics to one or more pigs during the previous 6 months. Over 70 percent of grower/finisher sites used injectable antibiotics to treat respiratory disease. Almost 75 percent of grower/finisher sites had administered **water**-soluble antibiotics to pigs for 1 or more days during the previous 6 months. Almost two-thirds of grower/finisher sites used water-soluble antibiotics to treat respiratory disease. Over 90 percent of grower/finisher sites had administered **feed** antibiotics to pigs for 1 or more days during the previous 6 months. Over 60 percent of sites used feed antibiotics to prevent disease and control disease spread. Half of grower/finisher sites used antibiotics in feed for growth promotion.

Almost 80 percent of grower/finisher sites included DDGS in at least one diet. This percentage was similar across all size groups. Overall, DDGS made up 21.8 percent of the grower/finisher diet on sites using DDGS. Spray-dried plasma, blood meal, and other blood products were used in grower/finisher diets on almost 12 percent of large grower/finisher sites.

Wean-to-finish phase

The disease problems reported by the highest percentages of large wean-to-finish sites were influenza (69.8 percent) and PRRS (61.4 percent). More than 85 percent of wean-to-finish sites vaccinated pigs for PCV2 and *Mycoplasma hyopneumoniae*. About one-third of wean-to-finish sites vaccinated pigs for erysipelas and *E. coli*. On the 15.4 percent of wean-to-finish sites that vaccinated pigs against influenza, almost 100 percent of pigs received an autogenous influenza vaccine.

Over 90 percent of wean-to-finish sites had administered **injectable** antibiotics to one or more pigs during the previous 6 months. Over 50 percent of wean-to-finish sites used **injectable** antibiotics to treat respiratory disease. Over 85 percent of wean-to-finish sites had administered **water**-soluble antibiotics to pigs for 1 or more days during the previous 6 months. Almost half of wean-to-finish sites used water-soluble antibiotics to treat respiratory disease. Almost 98 percent of wean-to-finish sites had administered **feed** antibiotics to pigs for 1 or more days during the previous 6 months. Over 80 percent of wean-to-finish sites used feed antibiotics to prevent disease and control disease spread. About 40 percent of wean-to-finish sites used antibiotics in feed for growth promotion.

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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, State and Federal veterinary medical officers, and animal health technicians who visited the operations and collected the data for the Swine 2012 study. Their hard work and dedication to USDA's National Animal Health Monitoring System (NAHMS) were invaluable in providing quality data for Swine 2012 reports. We would also like to thank the personnel at the Center for Epidemiology and Animal Health for their efforts in generating and distributing valuable reports from Swine 2012 data.

Additional biological sampling and testing for the Swine 2012 study were afforded by the generous contributions of collaborators:

- USDA–APHIS, National Veterinary Services Laboratory
- USDA–ARS, Beltsville Agricultural Research Center
- USDA–ARS, Russell Research Center
- National Pork Board
- Kansas State University, Manhattan
- University of Minnesota, St. Paul
- Boehringer Ingelheim Vetmedica, Inc.

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

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Suggested bibliographic citation for this report:

USDA. 2015. Swine 2012 “Part II: Reference of Swine Health and Health Management in the United States, 2012”
USDA–APHIS–VS–CEAH–NAHMS. Fort Collins, CO
#676.0216

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

Introduction

The National Animal Health Monitoring System (NAHMS) is a nonregulatory program of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service. NAHMS is designed to help meet the Nation's animal-health information needs and has collected data on animal health, productivity, and management practices on U.S. swine operations in five previous studies.

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 in animal health and management. NAHMS conducted the 1990 National Swine Survey in 18 States, with a target population of operations with at least 1 sow. The 18 States represented 95 percent of the U.S. swine population. National estimates generated from this study are reported in "Morbidity/ Mortality and Health Management of Swine in the United States" (November 1991).

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 "Swine '95 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 both participants and the industry with information on the U.S. swine herd on operations with 100 or more pigs. The National Agricultural Statistics Service (NASS) collaborated with 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 accounted for 94 percent of the U.S. pig inventory and 92 percent of U.S. pork producers with 100 or more pigs. Results from this study are reported in "Part I: Reference of Swine Health and Management, 2000" (August 2001); "Part II: Reference of Swine Health and Management, 2000" (March 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 in the Swine 2000 study. Seventeen States participated in the Swine 2006 study, accounting for 94 percent of U.S. swine operations and inventory on operations with 100 or more pigs. As with Swine 2000, the Swine 2006 sample referred to the population of operations with 100 or more pigs in the 17 selected 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).

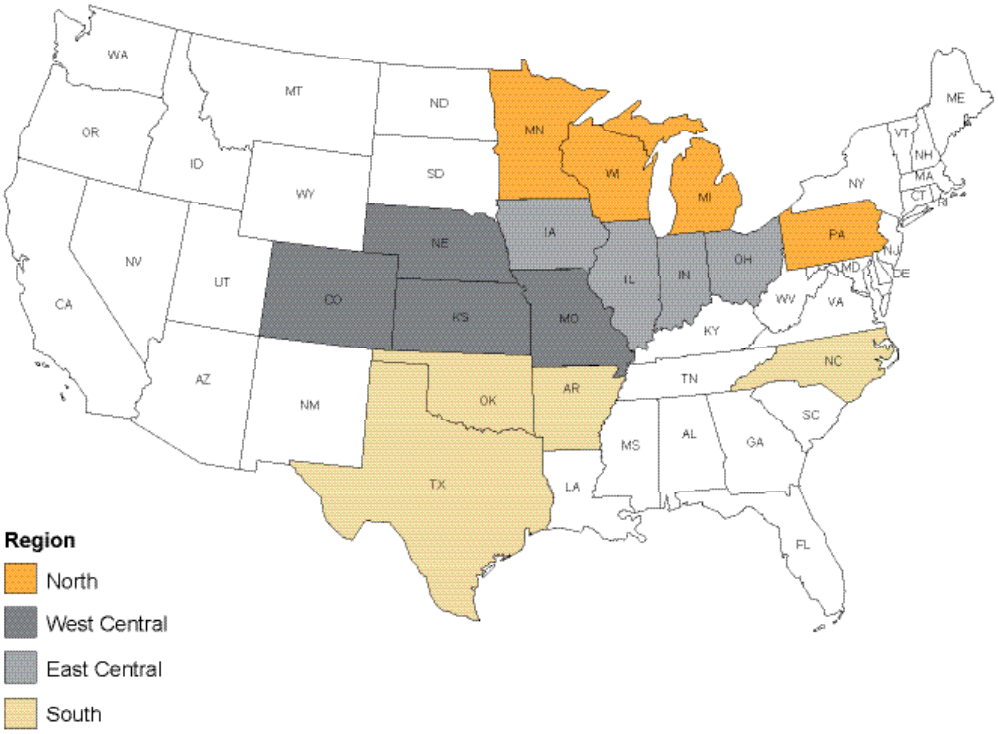
The Small-Enterprise Swine 2007 study described the health and management practices on operations with fewer than 100 pigs. The study covered States that had participated in previous national swine studies plus States considered at risk for exposure to feral swine, and transmission of classical swine fever and pseudorabies. The information gathered in this study provided a more complete picture of small-enterprise swine operations and the risk of introduction of these diseases. Thirty-one States participated in the study. These States accounted for 88.3 percent of swine and 84.4 percent of operations with fewer than 100 pigs, according to the 2002 Census of Agriculture. Results from this study are reported in "Small-Enterprise Swine 2007: Reference of Management Practices on Small-Enterprise Swine Operations in the United States, 2007" (February 2009).

Swine 2012 comprises 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 1 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 interview. Producers that completed Phase I, either by phone or interview, were asked to continue with phase 2 of the study. The questionnaire used in Phase 2 was administered by State and Federal veterinary medical officers (VMO) 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 2 of the study (VMO data collection).

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 questionnaire and then followed-up with nonrespondents via computer assisted telephone interview. Results from the 2012 small-enterprise swine study are presented in "Swine 2012: Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012" (February 2014).

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

Swine 2012 Selected States



Terms Used in This Report

Operation: The overall business and top-level management unit for a swine farm, which might consist of one or more sites. An operation can encompass all production phases of swine rearing (e.g., 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 Site).

Percent animals: The number of animals 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 number of animals 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 (e.g., percentage of sites located within each region). Percentages will not sum to 100 where the attributes are not mutually exclusive (e.g., the percentage of sites using treatment methods where sites may have used more than one method). The percent-sites estimates primarily reflect smaller sites, since they make up the majority of sites.

Pig-level average: A single site value multiplied by the number of animals on that site and summed across sites and divided by total number of animals on all sites.

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 (0.0). If there were no reports of the event, no standard error was reported (—).

Production phases:

Farrowing: Production phase with sows or gilts designated for breeding that farrow (gave birth to a litter of piglets).
Gestation: Production phase with sows or gilts designated for breeding that service (breed) and/or farrow sows and gilts.
Grower/Finisher: Pigs are fed-out from approximately 60 lb to final market weight for slaughter.
Nursery: Newly weaned pigs are managed, fed, and housed until they go into the grower/finisher phase (at approximately 60 lb).
Wean-to-finish: Specialized production site that receives newly weaned pigs that are

managed, fed, and housed to final market weight for slaughter.

Regions:

- **Midwest:** Iowa, Minnesota, Nebraska, South Dakota
- **East:** Illinois, Indiana, Ohio, Pennsylvania
- **South:** Kansas, Missouri, North Carolina, Oklahoma, Texas

Sample profile: Information that describes characteristics of the operations and sites from which Swine 2012 data were collected.

Separate site: A facility completely separate geographically or in the same location but physically separated (no livestock runways or paths joining other production facilities). It also might be managed as its own site, with separate procedures, biosecurity measures, and workers.

Site: One geographic location or address that functions as a unit to house one or more production phases in swine rearing. An example would be a gestation/farrowing site or a nursery site. A site can encompass more than one production phase, such as a “farrow-to-finish” site, which has gestation, farrowing, nursery, and grower/finisher pigs all at the 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 Operation.)

Site average: The average value for each site summed over all sites reporting and divided by the number of sites reporting.

Size of site: Size groupings were based on the total number of swine present on June 1, 2012. Size of site was categorized as small (fewer than 2,000 pigs), medium (2,000 to 4,999), and large (5,000 or more). For tables relating to breeding herds, size of site was based on the number of sows and gilts on-site: small (fewer than 250), medium (250 to 499), and large (500 or more).

Split-sex feeding: Separating market pigs by sex and feeding them different diets.

Total inventory: All swine present on the site on June 1, 2012.

Section I: Population Estimates

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

A. Site Classification by Production Phase

More than two-thirds of swine production sites had a grower/finisher phase. Almost one-fourth of production sites had a breeding herd.

A.1. Percentage of sites by production phase and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Production phase	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Breeding females	31.9	(3.8)	13.1	(2.7)	29.1	(8.8)	23.5	(3.0)
Nursery	47.2	(4.6)	18.5	(3.8)	30.1	(8.7)	32.0	(4.1)
Grower/finisher	67.3	(5.0)	69.6	(8.2)	57.8	(8.9)	66.8	(4.9)
Wean-to-finish	10.3	(3.9)	20.6	(8.6)	18.1	(7.5)	16.0	(5.1)

In the South region, less than 1 percent of sites had a wean-to-finish phase compared with over 25 percent of sites in the East region.

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

	Percent Sites					
	Region					
	Midwest		**East**		**South**	
Production phase	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Breeding females	17.5	(3.0)	28.1	(7.8)	38.0	(5.3)
Nursery	31.9	(6.0)	27.5	(7.7)	38.3	(5.0)
Grower/finisher	68.6	(6.5)	59.2	(12.0)	74.1	(4.2)
Wean-to-finish	14.9	(7.5)	27.5	(10.7)	0.1	(0.0)

B. Breeding Herd Health and Vaccination

Note: All tables in section B refer to sites with breeding females. Herd-size categories are based on the number of sows and gilts on-site.

1. Disease problems in breeding females

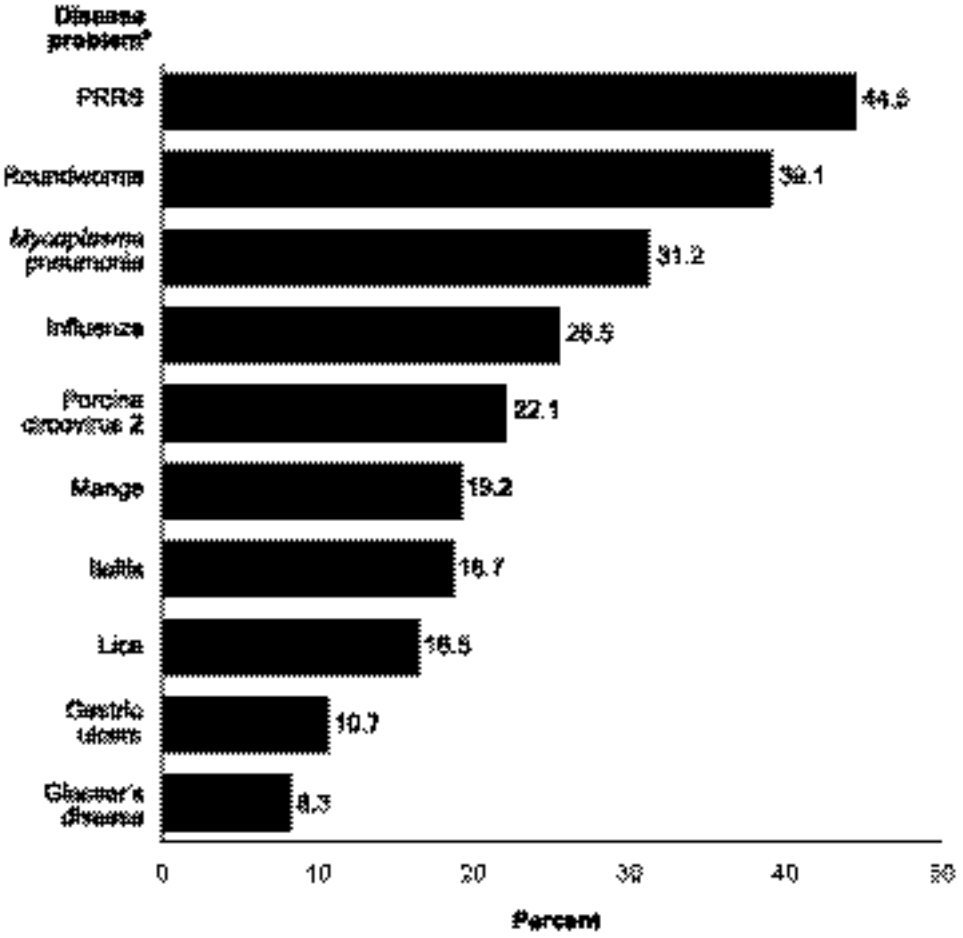
The three disease problems reported by the highest percentages of large breeding herds were PRRS, *Mycoplasma* pneumonia, and influenza. The three disease problems reported by the highest percentages of small breeding herds were roundworms, mange, and lice. Only small herds reported that transmissible gastroenteritis was a problem in the breeding herd.

B.1. Percentage of breeding herds in which the following disease problems were present in breeding females during the previous 12 months, by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Disease problem*	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
PRRS	26.7	(6.2)	60.9	(11.9)	57.0	(6.3)	44.5	(4.6)
Roundworms	45.9	(7.0)	54.7	(11.9)	26.0	(7.4)	39.1	(5.1)
Mycoplasma pneumonia	19.4	(5.6)	26.2	(10.7)	45.4	(7.2)	31.2	(4.7)
Influenza	12.2	(4.0)	37.8	(11.3)	34.8	(9.3)	25.5	(4.3)
Porcine circovirus 2 (PCVAD)	18.5	(5.1)	20.9	(9.4)	26.4	(7.5)	22.1	(3.9)
Mange	36.1	(6.6)	21.4	(9.3)	0.7	(0.7)	19.2	(3.7)
Ileitis	13.4	(5.5)	17.3	(8.1)	24.9	(7.2)	18.7	(3.8)
Lice	32.1	(6.2)	16.8	(9.1)	0.0	(0.0)	16.5	(3.3)
Gastric ulcers	6.4	(4.9)	10.6	(5.8)	15.1	(5.0)	10.7	(3.0)
Glasser's disease	3.3	(2.2)	7.2	(6.5)	14.0	(5.4)	8.3	(2.5)
Swine dysentery	12.1	(5.6)	0.0	(0.0)	1.8	(1.6)	5.9	(2.6)
Parvovirus	8.1	(3.6)	2.7	(2.6)	1.4	(1.0)	4.5	(1.7)
Erysipelas	3.1	(1.6)	0.0	(0.0)	6.7	(2.9)	4.1	(1.4)
Salmonella	2.8	(1.9)	0.0	(0.0)	3.5	(2.5)	2.6	(1.3)
Leptospirosis	3.8	(2.8)	0.0	(0.0)	0.0	(0.0)	1.6	(1.2)
Actinobacillus pleuropneumonia (APP)	1.1	(1.0)	0.0	(0.0)	1.0	(0.8)	0.9	(0.5)
Transmissible gastroenteritis (TGE)	1.1	(1.0)	0.0	(0.0)	0.0	(0.0)	0.5	(0.4)
Other	3.3	(2.3)	0.0	(0.0)	0.3	(0.2)	1.5	(1.0)

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

Percentage of breeding herds in which the following disease problems were present in breeding females during the previous 12 months



*This graph reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

2. Disease problems in preweaned pigs

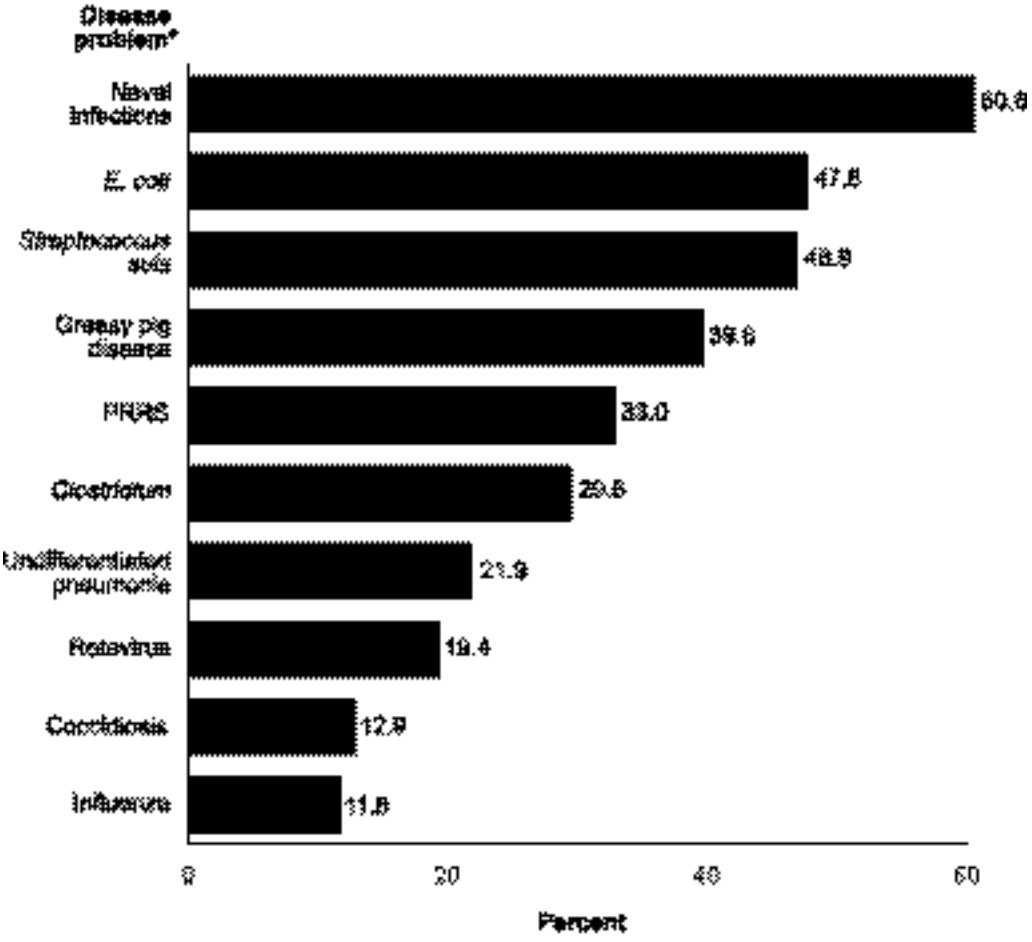
The highest percentages of herds reported that the top three disease problems in suckling pigs were navel infections, colibacillosis, and *Streptococcus suis,* regardless of herd size. A higher percentage of large breeding herds reported PRRS and *Clostridium* problems in suckling pigs compared with small breeding herds.

B.2. Percentage of breeding herds in which the following disease problems were present in preweaned pigs during the previous 12 months, by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Disease problem*	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Navel infections	45.3	(7.3)	78.1	(8.8)	70.2	(7.8)	60.6	(5.0)
E. coli (colibacillosis)	31.5	(6.5)	46.6	(10.9)	65.6	(8.5)	47.8	(5.5)
Streptococcus suis	38.8	(6.9)	39.2	(10.6)	59.2	(6.4)	46.9	(4.7)
Greasy pig disease	25.4	(6.8)	54.0	(10.9)	49.5	(7.0)	39.8	(4.7)
PRRS	10.9	(4.3)	45.6	(11.7)	51.5	(7.0)	33.0	(4.6)
Clostridium	16.7	(5.2)	13.3	(7.2)	50.1	(7.0)	29.6	(4.6)
Undifferentiated pneumonia	13.4	(4.9)	27.9	(9.0)	28.6	(5.5)	21.9	(3.5)
Rotavirus	6.7	(2.9)	0.0	(0.0)	41.0	(11.7)	19.4	(6.2)
Coccidiosis	9.1	(4.2)	11.3	(6.2)	17.6	(6.1)	12.9	(3.0)
Influenza	2.8	(1.9)	7.9	(5.3)	22.8	(6.9)	11.8	(2.8)
Salmonella	1.1	(1.0)	4.4	(4.1)	2.5	(2.0)	2.2	(1.2)
TGE	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	3.8	(2.6)	4.6	(4.3)	3.6	(2.2)	3.9	(1.4)

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

Percentage of breeding herds in which the following disease problems were present in preweaned pigs during the previous 12 months



*This graph reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

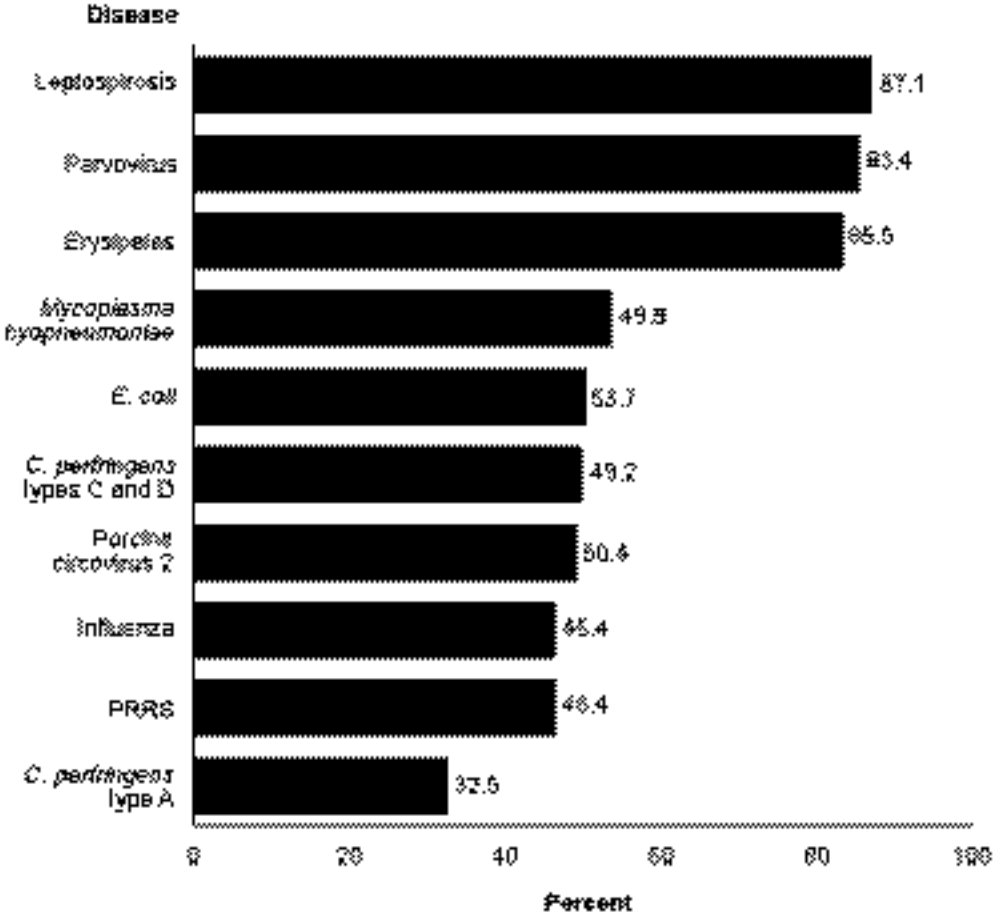
3. Vaccination practices

The three vaccines administered to breeding females by the highest percentages herds, regardless of size, were for leptospirosis, erysipelas, and parvovirus. Over 90 percent of large breeding herds gave these vaccines compared with about 75 percent of small herds. Over three-fourths of large breeding herds also vaccinated for influenza, *Mycoplasma hyopneumoniae*, and PCV2.

B.3. Percentage of breeding herds that vaccinated breeding females at any time (including before arrival) against the following diseases, by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 250)		Medium (250–499)		Large (500 or more)		All herds	
Disease	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
APP	2.6	(2.5)	18.9	(8.5)	3.4	(2.0)	5.5	(2.0)
Actinobacillus suis	3.0	(2.0)	17.6	(8.6)	2.5	(1.9)	5.1	(1.9)
Atrophic rhinitis	35.4	(6.7)	30.1	(11.0)	16.3	(6.9)	26.9	(4.7)
C. difficile	7.4	(2.9)	9.9	(7.2)	28.6	(8.9)	16.3	(4.6)
C. perfringens type A	17.0	(5.0)	28.5	(10.2)	51.0	(11.6)	32.5	(6.3)
C. perfringens types C and D	42.6	(7.0)	55.9	(10.3)	53.9	(7.8)	49.2	(4.7)
Erysipelas	77.8	(5.6)	82.4	(7.8)	95.1	(2.4)	85.5	(3.1)
E. coli (K88, K99, 987P, F41)	35.1	(6.9)	65.7	(11.1)	69.4	(6.1)	53.7	(4.5)
Glasser's disease	3.4	(3.2)	10.5	(5.8)	22.1	(5.6)	12.0	(3.0)
Ileitis/ proliferative enteritis	7.0	(2.9)	12.1	(6.5)	35.1	(6.3)	19.1	(3.3)
Influenza	17.6	(5.4)	39.6	(10.8)	80.5	(5.9)	46.4	(5.6)
Leptospirosis	78.9	(5.4)	85.7	(7.2)	96.6	(1.9)	87.1	(2.9)
Mycoplasma hyopneumoniae	24.5	(5.8)	43.4	(10.6)	80.2	(5.6)	49.9	(5.5)
Parvovirus	78.1	(5.4)	73.7	(10.1)	93.0	(3.6)	83.4	(3.4)
Porcine circovirus 2 (PCVAD)	24.5	(5.7)	50.3	(10.4)	78.8	(7.2)	50.4	(5.5)
PRRS	26.1	(5.9)	58.4	(11.2)	63.7	(6.3)	46.4	(4.6)
Rotavirus	6.3	(2.7)	17.7	(7.5)	19.2	(5.6)	13.3	(2.7)
Salmonella	1.5	(1.5)	3.3	(3.2)	19.1	(5.7)	8.9	(2.8)
Streptococcus suis	5.2	(2.5)	6.8	(4.7)	11.6	(6.2)	8.0	(2.8)
Transmissible gastroenteritis	0.0	(0.0)	4.1	(3.9)	0.2	(0.2)	0.7	(0.6)
Other	1.4	(1.4)	0.0	(0.0)	0.6	(0.4)	0.9	(0.6)

Percentage of breeding herds that vaccinated breeding females at any time (including before arrival) against the following diseases



4. Influenza vaccination

More than 60 percent of large breeding herds vaccinated pigs against influenza before or at entry into the breeding herd. The highest percentage of breeding herds gave influenza vaccinations during gestation. Over one-half of large breeding herds vaccinated for influenza during the last 4 weeks of gestation.

B.4.a. Percentage of breeding herds that usually vaccinated breeding females against influenza during the following reproductive time periods, by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All herds**	
Time period	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Before entering breeding herd	4.7	(3.1)	23.6	(9.2)	65.8	(8.4)	33.1	(6.2)
As gilts at time of entering the breeding herd	18.4	(5.7)	23.4	(9.3)	61.0	(8.6)	36.6	(5.8)
During gestation up to 4 weeks *before* farrowing	7.7	(4.3)	9.0	(6.2)	30.3	(9.3)	17.2	(4.0)
During the *last* 4 weeks of gestation	6.2	(3.3)	12.0	(6.7)	53.9	(9.9)	26.6	(6.2)
From farrowing to weaning	1.3	(1.2)	0.0	(—)	4.0	(3.0)	2.2	(1.4)
After weaning through breeding/mating	1.3	(1.2)	4.3	(4.0)	0.8	(0.7)	1.6	(0.9)
At regular intervals, regardless of reproductive stage	3.6	(2.7)	10.0	(6.6)	20.2	(6.3)	11.4	(3.3)
Did not vaccinate	81.6	(5.7)	60.4	(10.8)	19.5	(5.9)	52.7	(5.6)

More than 60 percent of breeding females were in herds that vaccinated against influenza three times before the first farrowing. One-third of breeding females were in herds that vaccinated against influenza two times before the first farrowing (while in the breeding herd and either before or at entry).

B.4.b. For breeding herds that usually vaccinated breeding females against influenza, percentage of herds and percentage of sows and gilts, by vaccination timing:

Vaccination Timing						
Before entering breeding herd	**At entry**	**In the breeding herd**	**Percent sites**	**Std. error**	**Percent sows and gilts**	**Std. error**
Yes	Yes	Yes	51.4	(9.3)	61.9	(13.8)
Yes	Yes	No	2.9	(2.1)	1.0	(0.8)
Yes	No	Yes	16.4	(5.1)	24.0	(12.1)
No	Yes	Yes	19.8	(6.0)	9.2	(4.4)
Yes	No	No	0.3	(0.2)	0.1	(0.1)
No	Yes	No	2.7	(1.6)	1.1	(0.6)
No	No	Yes	6.4	(2.9)	2.7	(1.6)
			100.0		100.0	

B.4.c. For breeding herds that usually vaccinated breeding females against influenza, percentage of herds and percentage of breeding females by type of influenza vaccine used/received during the previous 12 months:

Influenza vaccine type	Percent breeding herds	Std. error	Percent breeding females	Std. error
Commercial influenza vaccine (killed)	73.7	(6.1)	69.9	(8.7)
Autogenous influenza vaccine (killed)	47.1	(9.9)	67.7	(10.9)

5. Porcine reproductive and respiratory syndrome vaccination

About 45 percent of large herds vaccinated breeding females against PRRS before or at entry into the breeding herd. Vaccination for PRRS given while in the breeding herd was given at regular intervals by over 40 percent of large breeding herds, regardless of reproductive stage. A higher percentage of large breeding herds vaccinated in response to a PRRS outbreak (33.0 percent) than medium (12.0 percent) or small (5.8 percent) breeding herds.

B.5.a. Percentage of breeding herds that usually vaccinated breeding females against PRRS during the following reproductive stages, by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All herds**	
Reproductive stage	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Before entering breeding herd	11.9	(4.5)	41.8	(11.6)	44.8	(7.5)	30.4	(4.3)
As gilts at time of entry into the breeding herd	19.5	(5.3)	39.8	(10.2)	46.9	(7.6)	34.0	(4.7)
During gestation up to 4 weeks *before* farrowing	8.8	(4.3)	0.0	(0.0)	15.3	(5.4)	10.0	(2.8)
During the *last* 4 weeks of gestation	5.5	(3.7)	3.3	(3.2)	17.4	(5.9)	10.0	(3.2)
From farrowing to weaning	2.1	(1.4)	14.1	(9.6)	2.2	(1.2)	4.1	(1.8)
After weaning through breeding/mating	6.0	(3.3)	8.8	(5.9)	9.5	(4.5)	7.8	(2.5)
At regular intervals, regardless of reproductive stage	8.8	(3.8)	41.9	(11.5)	40.9	(7.6)	27.3	(4.7)
In response to a PRRS outbreak	5.8	(2.7)	12.0	(6.7)	33.0	(6.7)	17.9	(3.6)
Did not vaccinate	73.0	(6.1)	41.6	(11.2)	36.3	(6.3)	52.9	(4.7)

Almost half of breeding females were in herds that vaccinated pigs against PRRS three times before the first farrowing.

B.5.b. For breeding herds that usually vaccinated breeding females against PRRS, percentage of herds and percentage of sows and gilts, by vaccine timing:

Vaccine Timing						
Before entering breeding herd	**At entry**	**In the breeding herd**	**Percent breeding herds**	**Std. error**	**Percent sows/gilts**	**Std. error**
Yes	Yes	Yes	41.6	(6.7)	49.6	(12.6)
Yes	Yes	No	3.2	(2.2)	0.8	(0.8)
Yes	No	Yes	15.2	(5.3)	22.2	(12.5)
No	Yes	Yes	25.1	(6.0)	13.8	(4.9)
Yes	No	No	5.4	(2.8)	4.2	(2.2)
No	Yes	No	1.6	(1.5)	0.1	(0.1)
No	No	Yes	7.9	(3.3)	9.3	(5.9)
			100.0		100.0	

B.5.c. For breeding herds that usually vaccinated breeding females for PRRS, percentage of herds and percentage of breeding females in these herds, by type of PRRS vaccine used during the previous 12 months:

PRRS vaccine type	Percent breeding herds	Std. error	Percent breeding females	Std. error
Commercial modified-live PRRS vaccine	52.4	(7.5)	38.5	(12.4)
Autogenous PRRS vaccine (killed)	37.0	(8.5)	36.6	(15.4)

6. Porcine reproductive and respiratory syndrome control

Nearly all medium and large breeding herds had specific control measures for PRRS. For large herds, 35.1 percent exposed gilts via infected animals, 26.6 percent exposed only replacement gilts via feedback of tissues from infected animals, and 23.0 percent exposed the entire breeding herd. Less than half of small herds had any specific control measures for PRRS compared with over 90 percent of medium and large herds.

B.6.a. Percentage of breeding herds by measure used **specifically** to control or eliminate PRRS in breeding females during the previous 12 months, and by herd size:

	Percent Breeding Herds							
	Herd Size (number of sows and gilts)							
	Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All herds**	
Control measure	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Expose replacement gilts via infected (seeder) animals	6.4	(3.1)	35.2	(10.7)	35.1	(8.6)	22.6	(4.8)
Expose replacement gilts via feedback of tissues from infected animals	2.4	(1.6)	22.0	(9.2)	26.6	(9.4)	15.3	(4.8)
Expose only replacement gilts[1]	7.2	(3.7)	6.4	(4.4)	33.6	(8.7)	17.7	(4.8)
Expose breeding herd[1]	2.4	(1.6)	6.4	(4.4)	23.0	(9.7)	11.3	(4.7)
Segregate gilts from breeding herd (parity segregation) so that they enter the sow herd after weaning their first litter	7.1	(3.4)	4.3	(4.0)	7.9	(3.6)	7.0	(2.2)
Depopulate whole herd	0.0	(0.0)	0.0	(0.0)	1.5	(1.1)	0.6	(0.4)
Temporarily cease introduction of replacement gilts (roll-over, herd closure)	9.6	(3.8)	11.9	(6.6)	13.3	(4.5)	11.5	(2.6)
Introduce PRRS negative replacement gilts	16.8	(4.6)	36.8	(11.3)	42.5	(8.1)	30.3	(4.8)
Introduce PRRS positive replacement gilts[2]	9.9	(5.6)	40.6	(11.8)	36.7	(6.1)	25.6	(4.1)
Use semen only from boars that are PRRS negative and monitored	34.2	(6.6)	79.4	(9.3)	82.6	(6.1)	60.9	(5.1)
Use air filtration system	0.0	(0.0)	0.0	(0.0)	1.7	(1.7)	0.7	(0.7)
Other measures not including vaccination	0.0	(0.0)	5.8	(5.5)	2.7	(2.3)	2.0	(1.3)
Any of above	48.0	(7.1)	95.4	(4.3)	93.3	(3.5)	73.7	(4.3)

[1]Via live virus inoculation using serum from infected animals.
[2]Gilts that were exposed, recovered, immune, and nonshedding.

Over one-tenth of breeding herds (11.5 percent) had temporarily closed their herd during the previous 12 months to control PRRS (table B.6.a). On average, these herds were closed for 22 weeks.

B.6.b. For breeding herds that temporarily closed their herd to control PRRS, average number of weeks herd was closed, by herd size:

Average Number of Weeks							
Herd Size (number of sows and gilts)							
Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All herds**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
29.3	(2.4)	12.1	(2.0)	22.9	(2.3)	22.5	(2.2)

B.6.c. For breeding herds that temporarily closed their herd to control PRRS, percentage of herds by average number of weeks herd was closed:

Average number of weeks	Percent breeding herds	Std. error
Less than 16	19.7	(9.8)
16–26	47.4	(12.9)
More than 26	32.8	(12.1)
Total	100.0	

B.6.d. For herds that temporarily closed their herd to control PRRS, percentage of herds by average number of weeks herd was closed, and by region:

	Percent Breeding Herds					
	Region					
	Midwest		East		South	
Average number of weeks	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Less than 16	25.8	(12.4)	0.0	(0.0)	0.0	(0.0)
16 to 26	36.3	(14.1)	67.3	(30.7)	100.0	(0.0)
More than 26	37.8	(14.4)	32.7	(30.7)	0.0	(0.0)
Total	100.0		100.0		100.0	

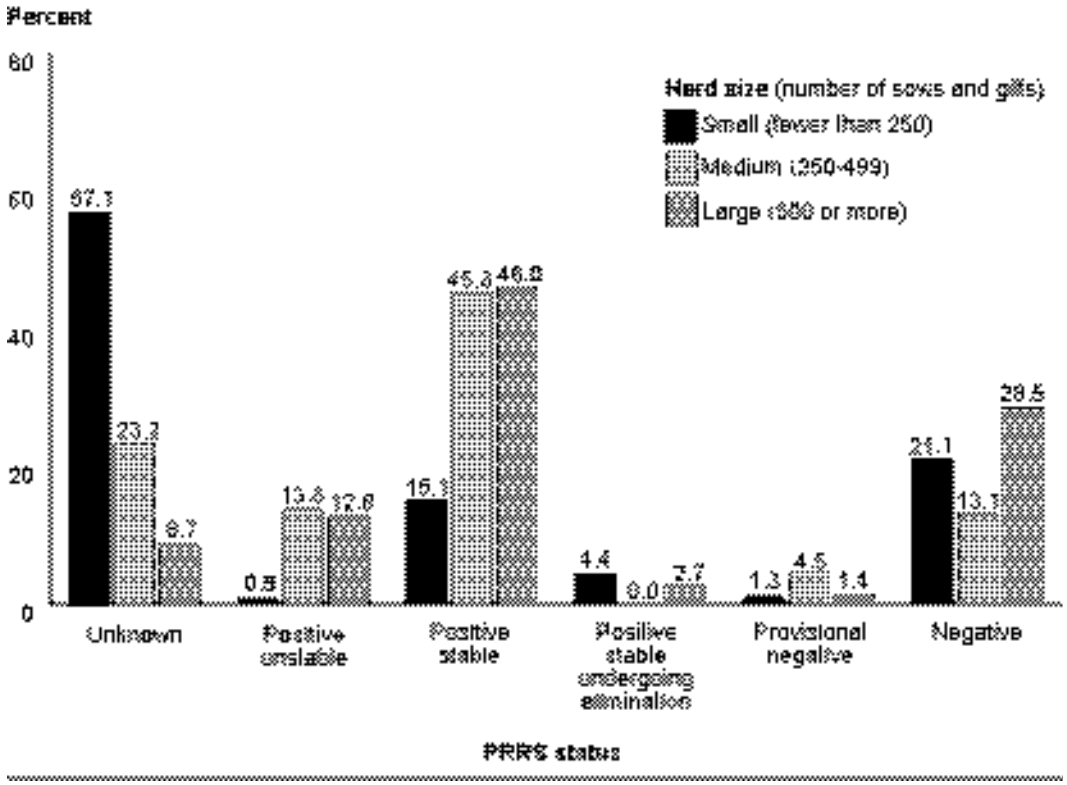
Less than one-tenth of large herds had an unknown PRRS status[1] compared with more than half of small herds. Over one-tenth of medium and large herds were PRRS positive unstable. Almost half of large herds (48.7 percent) were PRRS positive stable. Over one-fifth of all breeding herds were classified as PRRS negative.

B.6.e. Percentage of breeding herds and percentage of sows and gilts, by PRRS status and by herd size:

	Percent Breeding Herds									
	Herd Size (number of sows and gilts)									
	Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All sites**		**Percent sows and gilts**	
PRRS status	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Unknown	57.1	(7.4)	23.3	(9.4)	8.7	(4.7)	31.7	(4.8)	10.1	(5.3)
Positive unstable	0.9	(0.9)	13.8	(7.4)	12.8	(4.5)	7.9	(2.2)	14.2	(6.0)
Positive stable	15.1	(5.4)	45.3	(11.7)	46.0	(7.4)	32.8	(4.8)	38.4	(7.4)
Positive stable undergoing elimination	4.4	(2.4)	0.0	(0.0)	2.7	(1.8)	2.9	(1.3)	7.1	(5.8)
Provisional negative	1.3	(1.3)	4.5	(4.4)	1.4	(1.2)	1.9	(1.0)	1.3	(1.0)
Negative	21.1	(6.8)	13.1	(8.5)	28.5	(5.9)	22.8	(4.1)	29.0	(7.8)
Total	100.0		100.0		100.0		100.0		100.0	

[1]PRRS status based on definitions in the following paper:
Holtkamp DJ, Polson DD, Torremorell M, et al. 2011. "Terminology for classifying swine herds by porcine reproductive and respiratory syndrome virus status." J Swine Health Prod 19(1):44–56.

Percentage of breeding herds by PRRS status and by herd size



B.6.f. Percentage of breeding herds by PRRS status and by region:

	Percent Breeding Herds					
	Region					
	Midwest		East		South	
PRRS status	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Unknown	36.2	(6.5)	29.8	(7.7)	26.5	(11.0)
Positive unstable	9.5	(3.7)	3.9	(2.3)	10.6	(5.7)
Positive stable	35.8	(6.2)	26.5	(7.5)	36.3	(12.2)
Positive stable undergoing elimination	5.2	(2.3)	0.0	(0.0)	3.2	(3.2)
Provisional negative	0.2	(0.2)	2.2	(2.2)	4.3	(3.3)
Negative	13.0	(3.6)	37.6	(8.8)	19.2	(7.9)
Total	100.0		100.0		100.0	

7. Use of antibiotics to treat disease

Over half of breeding herds had used an antimicrobial on one or more sows and gilts to treat disease in breeding females during the previous 12 months.

B.7. Percentage of breeding herds that used an antimicrobial to **treat** disease in breeding females during the previous 12 months, by herd size:

Percent Breeding Herds							
Herd Size (number of sows and gilts)							
Small (fewer than 250)		**Medium** (250–499)		**Large** (500 or more)		**All herds**	
Pct.	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
41.4	(7.3)	60.5	(12.0)	78.6	(6.4)	59.5	(5.3)

C. Nursery Phase

1. Disease problems

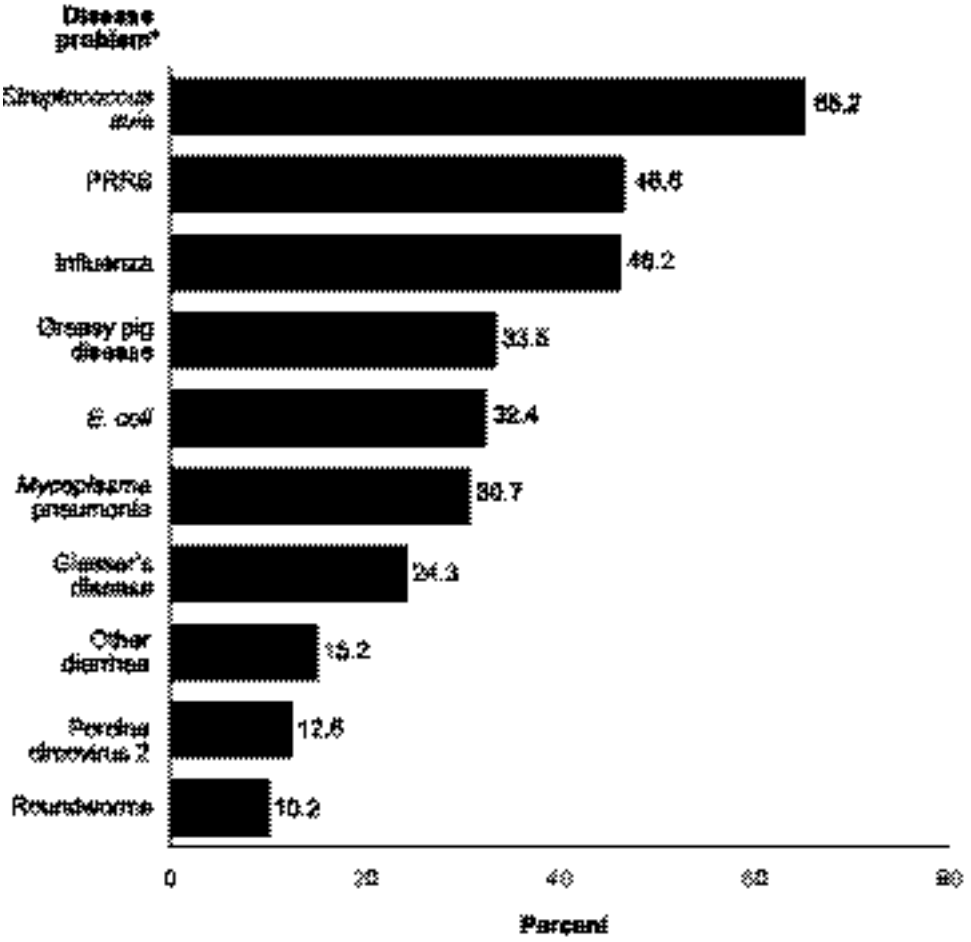
For nursery pigs, *Streptococcus suis*, PRRS, and influenza were the disease problems reported by the highest percentages of sites, regardless of size. Nearly twice the percentage of large sites than small sites reported that PRRS was a problem in nursery pigs.

C.1.a. Percentage of sites in which the following disease problems were present in nursery pigs during the previous 12 months, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Disease problem*	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Streptococcus suis	52.8	(6.8)	81.3	(6.7)	86.7	(6.2)	65.2	(5.8)
PRRS	35.7	(7.3)	58.0	(10.8)	70.2	(11.6)	46.6	(7.6)
Influenza	45.1	(7.0)	38.3	(10.2)	63.1	(13.6)	46.2	(4.8)
Greasy pig disease	26.3	(5.6)	32.4	(9.2)	63.1	(13.8)	33.5	(4.2)
E. coli	25.8	(5.2)	47.1	(7.8)	33.9	(13.3)	32.4	(4.3)
Mycoplasma pneumonia	30.7	(7.2)	32.2	(9.5)	28.3	(11.8)	30.7	(6.0)
Glasser's disease	13.0	(5.1)	32.8	(14.2)	54.5	(15.7)	24.3	(9.2)
Other diarrhea	11.1	(3.9)	16.1	(6.1)	29.8	(9.8)	15.2	(3.0)
Porcine circovirus 2 (PCVAD)	7.4	(2.5)	18.6	(7.0)	22.6	(11.0)	12.6	(2.7)
Roundworms	14.9	(4.2)	5.4	(4.0)	0.0	(0.0)	10.2	(2.9)
Mange	12.6	(3.8)	2.8	(2.1)	0.0	(0.0)	8.2	(2.5)
Salmonella	4.9	(1.8)	8.1	(4.5)	11.3	(6.0)	6.7	(2.0)
Swine dysentery	4.4	(1.8)	8.1	(6.2)	12.5	(7.6)	6.5	(2.3)
Edema disease (*E. coli*)	3.4	(1.5)	15.1	(5.9)	2.0	(2.1)	6.1	(1.8)
Lice	9.9	(3.6)	0.0	(0.0)	0.0	(0.0)	5.9	(2.2)
APP	0.0	(0.0)	6.3	(4.1)	4.5	(3.9)	2.3	(1.2)
Porcine dermatitis and nephropathy syndrome (PDNS)	0.0	(0.0)	4.7	(3.7)	1.3	(1.3)	1.4	(1.0)
Other	6.4	(3.2)	4.7	(3.1)	2.4	(1.4)	5.3	(2.1)

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

Percentage of sites in which the the following disease problems were present in nursery pigs during the previous 12 months



*This graph reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

Morbidity rate (measured as a percentage of nursery pigs affected in a group) was above 30 percent for nursery pigs with PRRS, *Mycoplasma* pneumonia, and roundworms. Disease problems with low morbidity in nursery pigs (<10 percent) included APP, Glasser's disease, *Salmonella,* edema disease, PCVAD, PDNS, greasy pig disease, mange, and lice.

C.1.b. For sites in which the following disease problems were present in nursery pigs during the previous 12 months, percentage of nursery pigs affected during the most recent outbreak of disease, by disease problem:

Disease problem[1]	Percent nursery pigs	Std. error
Streptococcus suis	10.3	(3.5)
PRRS	56.5	(14.8)
Influenza	16.9	(6.0)
Greasy pig disease	7.9	(4.2)
E. coli	11.6	(4.4)
Mycoplasma pneumonia	30.3	(14.3)
Glasser's disease	9.7	(4.7)
Other diarrhea	8.2	(1.2)
Porcine circovirus 2 (PCVAD)	2.2	(1.4)
Roundworms	44.2	(27.2)
Mange	8.0	(4.9)
Salmonella	5.2	(1.4)
Swine dysentery	10.0	(4.6)
Edema disease (*E. coli*)	5.0	(0.2)
Lice	[2]	
APP	[2]	
Porcine dermatitis and nephropathy syndrome (PDNS)	[2]	
TGE	[2]	
Other	5.1	(4.3)

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

[2]Too few to report.

2. Swine dysentery

For the 6.5 percent of sites that reported problems with swine dysentery, the case fatality rate for swine dysentery in the nursery was 3.5 percent. Almost 90 percent of sites with swine dysentery in nursery pigs treated the pigs.

C.2. For sites in which swine dysentery was present in nursery pigs during the previous 12 months, site average percentage of nursery pigs that were treated or died:

	Site average percent of nursery pigs	Std. error
Treated	57.8	(16.1)
Died	3.5	(1.8)

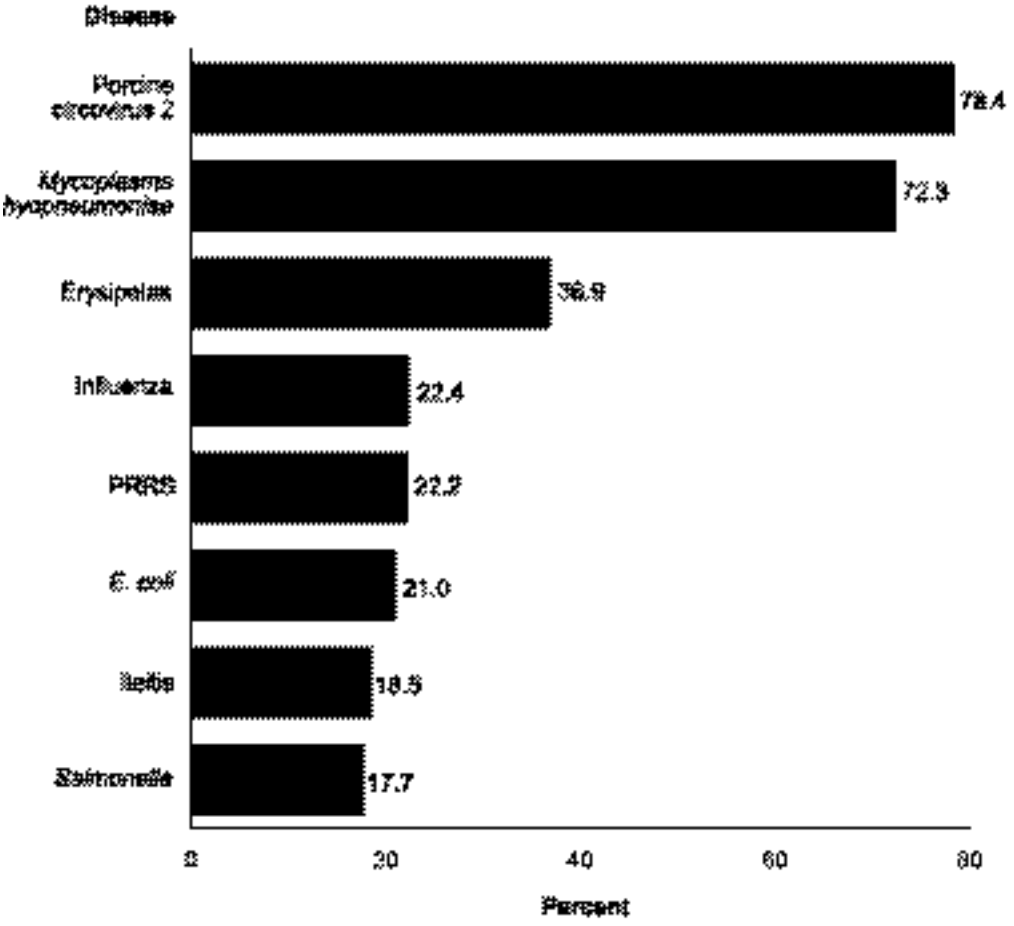
3. Vaccination practices

The majority of nursery sites, regardless of size, vaccinated nursery pigs for porcine circovirus 2 and *Mycoplasma hyopneumoniae*. Nearly all large nursery sites vaccinated nursery pigs against porcine circovirus 2. About one-fourth of medium and large sites vaccinated nursery pigs for *Salmonella*. More than one-third of nursery sites vaccinated pigs for erysipelas.

C.3. Percentage of sites that vaccinated nursery pigs against the following diseases at any time during the previous 12 months, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
APP	1.7	(1.0)	7.4	(4.3)	0.0	(0.0)	2.8	(1.2)
Actinobacillus suis	1.4	(1.3)	1.4	(1.1)	0.0	(0.0)	1.2	(0.8)
Atrophic rhinitis	19.0	(4.5)	8.4	(4.2)	3.0	(2.7)	13.9	(3.2)
C. difficile	0.0	(0.0)	0.0	(0.0)	0.6	(0.6)	0.1	(0.1)
C. perfringens Type A	0.0	(0.0)	1.8	(1.8)	0.0	(0.0)	0.5	(0.4)
C. perfringens Types C and D	7.4	(6.7)	1.8	(1.8)	0.0	(0.0)	4.9	(4.1)
Erysipelas	42.8	(6.6)	34.0	(9.3)	19.3	(8.3)	36.9	(6.0)
E. coli (K88, K99, 987P, F41)	8.1	(4.6)	34.6	(13.9)	49.2	(17.1)	21.0	(9.5)
Glasser's disease	6.1	(2.8)	4.0	(2.6)	7.9	(4.9)	5.8	(2.2)
Ileitis	16.1	(5.1)	27.3	(8.4)	13.7	(6.5)	18.5	(4.1)
Influenza	13.9	(5.0)	33.0	(14.2)	38.2	(20.3)	22.4	(9.5)
Leptospirosis	4.1	(2.1)	0.2	(0.2)	0.0	(0.0)	2.5	(1.3)
Mycoplasma hyopneumoniae	66.5	(7.1)	81.4	(7.6)	80.2	(9.0)	72.3	(5.8)
Porcine circovirus 2 (PCVAD)	70.7	(7.1)	85.2	(6.9)	97.1	(1.9)	78.4	(5.3)
PRRS	23.1	(7.1)	25.0	(7.9)	14.5	(7.5)	22.2	(4.6)
Rotavirus	0.9	(0.8)	0.0	(0.0)	0.6	(0.6)	0.6	(0.5)
Salmonella	12.2	(5.0)	26.4	(14.8)	25.2	(10.4)	17.7	(7.7)
Streptococcus suis	3.5	(1.5)	4.3	(2.5)	6.4	(4.0)	4.1	(1.3)
Other	1.4	(1.0)	1.7	(1.7)	0.0	(0.0)	1.2	(0.7)

Percentage of sites that vaccinated nursery pigs against the following diseases at any time during the previous 12 months



4. Influenza vaccination

Only 4.3 percent of nursery sites used two or more doses of vaccine to vaccinate nursery pigs against influenza.

C.4.a. Percentage of nursery sites that gave second and third doses of influenza vaccine to pigs, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Dose	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Second	2.1	(1.4)	8.1	(5.1)	4.7	(3.7)	4.0	(1.8)
Third	0.5	(0.5)	0.0	(0.0)	0.0	(0.0)	0.3	(0.3)

The average age of pigs that received the first dose of influenza vaccine was 6.3 weeks.

C.4.b. Site average age of pigs (weeks) when receiving the first, second, and third dose of influenza vaccine:

Dose	Average age of pigs (wk)	Std. error
First	6.3	(0.5)
Second	8.1	(1.1)
Third	15.0	(0.0)

On the 22.4 percent of nursery sites that vaccinated pigs against influenza, almost 95 percent of nursery pigs received an autogenous vaccine.

C.4.c. For sites that usually vaccinated against influenza during the nursery phase, percentage of sites by type of influenza vaccine used in nursery pigs during the previous 12 months and percentage of all nursery pigs on those sites:

Influenza vaccine type	Percent sites	Std. error	Percent nursery pigs	Std. error
Commercial influenza vaccine (killed)	24.6	(15.3)	7.3	(6.4)
Autogenous influenza vaccine (killed)	79.5	(13.1)	94.6	(5.1)

5. Response to respiratory disease outbreak

Almost half of nursery sites with a respiratory disease outbreak during the previous 12 months treated the whole room (all pigs in shared airspace with ill pigs). Almost one-fifth of sites treated only clinically ill pigs. A low percentage of sites did not treat any pigs with antibiotics.

C.5. Percentage of sites by action that best describes what was done during the most recent respiratory disease outbreak in nursery pigs during the previous 12 months, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Action	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Did not have clinical respiratory disease in nursery pigs in last 12 months	27.0	(5.5)	12.2	(5.1)	12.4	(6.7)	21.1	(4.3)
Did not treat any pigs with antibiotics	7.8	(3.5)	2.6	(2.5)	2.9	(2.2)	5.8	(2.3)
Treated only clinically ill pigs with antibiotics	17.2	(4.3)	21.0	(7.4)	16.4	(8.4)	18.0	(3.9)
Treated all pigs in same pen with clinically ill pigs with antibiotics	1.0	(0.7)	0.0	(0.0)	1.8	(1.5)	0.9	(0.5)
Treated all pigs in same pen and pens adjacent to clinically ill pigs with antibiotics	7.4	(6.7)	0.8	(0.8)	0.0	(0.0)	4.6	(4.1)
Treated all pigs in entire room with clinically ill pigs with antibiotics (all pigs with shared airspace)	39.5	(6.7)	63.3	(10.2)	66.5	(12.6)	49.6	(7.5)
Total	100.0		100.0		100.0		100.0	

6. Medications given by injection, in water, and in feed

Over 80 percent of nursery sites administered injectable antibiotics to one or more nursery pigs during the previous 6 months. Over half of nursery sites used injectable antibiotics to treat nursery pigs for respiratory disease. The two injectable antibiotics used by the highest percentages of sites to treat respiratory disease were ceftiofur (e.g., Excede) and enrofloxacin (e.g., Baytril 100).

C.6.a. For sites with nursery pigs, percentage of sites that gave the following medications by **injection** to one or more nursery pigs during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.
Antimicrobial treatment																
Ampicillin	0.0	(—)	0.3	(0.3)	2.5	(1.2)	0.0	(—)	0.7	(0.5)	0.0	(—)	1.5	(1.5)	5.0	(2.1)
Amoxicillin	0.0	(—)	0.0	(—)	5.5	(4.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	5.5	(4.2)
Ceftiofur	0.0	(—)	6.8	(2.4)	29.2	(4.8)	2.4	(1.6)	10.2	(6.2)	0.0	(—)	0.6	(0.5)	49.1	(7.4)
Enrofloxacin	0.0	(—)	2.5	(1.4)	31.2	(8.9)	2.1	(1.1)	0.6	(0.4)	0.0	(—)	0.1	(0.1)	36.4	(8.4)
Erythromycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Florfenicol	0.0	(—)	0.0	(—)	4.0	(1.7)	0.8	(0.8)	0.0	(—)	0.0	(—)	0.0	(—)	4.8	(1.9)
Gentamycin	0.0	(—)	0.8	(0.6)	1.3	(0.8)	0.6	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	2.7	(1.1)
Lincomycin	0.0	(—)	1.8	(0.9)	0.9	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.5)	3.1	(1.2)
Oxytetracycline	0.0	(—)	0.9	(0.5)	6.1	(2.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	6.9	(2.4)
Penicillin benzathine	0.0	(—)	2.9	(1.7)	1.3	(0.8)	0.0	(—)	3.7	(1.8)	0.0	(—)	0.9	(0.9)	8.8	(2.8)
Penicillin G potassium	0.0	(—)	5.9	(2.2)	11.3	(3.0)	0.6	(0.6)	5.1	(1.8)	0.0	(—)	8.5	(2.7)	31.4	(5.6)
Tulathromycin	0.0	(—)	2.5	(1.8)	10.6	(4.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	13.1	(4.3)
Tylosin	0.0	(—)	3.0	(1.9)	1.8	(1.1)	4.6	(1.7)	0.0	(—)	0.0	(—)	0.0	(—)	9.5	(2.9)
Any of the above antimicrobial treatments	0.0	(—)	16.4	(3.7)	59.9	(6.3)	10.6	(2.9)	18.3	(5.8)	0.0	(—)	12.0	(3.3)	83.4	(3.7)

Table cont'd →

C.6.a. (cont'd) For sites with nursery pigs, percentage of sites that gave the following medications by **injection** to one or more nursery pigs during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.4)	0.0	(—)	0.5	(0.4)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.1	(1.2)	0.0	(—)	3.1	(1.2)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.6	(1.3)	0.0	(—)	3.6	(1.3)
Supportive treatment																
Dexamethasone	0.0	(—)	0.9	(0.5)	2.5	(1.1)	0.0	(—)	1.7	(1.0)	0.0	(—)	1.4	(0.9)	6.5	(1.9)
Flunixin meglumine	0.0	(—)	0.0	(—)	0.1	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.1	(0.1)
Isoflupredone	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.3	(0.9)	0.0	(—)	0.3	(0.3)	1.6	(0.9)
Vitamin A, D, E	2.2	(1.6)	0.0	(—)	0.3	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.5)	3.0	(1.7)
Any of the above supportive treatments	2.2	(1.6)	0.9	(0.5)	2.8	(1.2)	0.0	(—)	3.0	(1.4)	0.0	(—)	2.2	(1.1)	10.6	(2.8)
Other medication	0.0	(—)	0.0	(—)	0.5	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.4)	0.9	(0.7)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

About two-thirds of nursery sites administered water-soluble antibiotics to nursery pigs for 1 or more days during the previous 6 months. Over 40 percent of nursery sites used water-soluble antibiotics to treat nursery pigs for respiratory disease. Chlortetracycline was the antibiotic used by the highest percentage of sites (18.8 percent) to treat respiratory disease. More than one-fifth of nursery sites used water-soluble antibiotics to treat nursery pigs for enteric disease, and almost one-fourth used water-soluble antibiotics for disease control and prevention. One-fourth of nursery sites used salicylic acid as supportive treatment.

C.6.b. For sites with nursery pigs, percentage of sites that gave nursery pigs the following medications in **water** for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Amoxicillin	0.0	(—)	14.0	(4.8)	7.6	(2.5)	0.0	(—)	2.4	(1.1)	0.0	(—)	0.9	(0.6)	24.8	(5.6)
Bacitracin	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.5)
Chlortetracycline	0.0	(—)	1.9	(1.0)	18.8	(7.6)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	20.7	(7.5)
Chlortetracyline/ sulphamethazine	0.0	(—)	0.0	(—)	0.5	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.5)
Florfenicol	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Gentamicin	0.0	(—)	4.0	(1.9)	1.6	(1.5)	7.3	(2.5)	0.0	(—)	0.0	(—)	0.0	(—)	12.8	(3.6)
Lincomycin	0.0	(—)	0.0	(—)	1.2	(0.8)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(0.8)
Lincomycin/ spectinomycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Neomycin	0.0	(—)	2.0	(1.0)	0.5	(0.5)	15.8	(5.2)	0.0	(—)	0.0	(—)	0.0	(—)	18.3	(5.0)
Oxytetracycline	0.0	(—)	0.9	(0.5)	5.2	(2.5)	0.9	(0.9)	0.0	(—)	0.0	(—)	0.0	(—)	7.0	(2.6)
Penicillin G potassium	0.0	(—)	3.2	(1.4)	1.5	(0.9)	0.5	(0.5)	3.4	(2.2)	0.0	(—)	0.0	(—)	8.5	(2.4)
Spectinomycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Sulfachlorpyridazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Sulfadimethoxine	0.0	(—)	0.0	(—)	4.7	(2.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	4.7	(2.4)
Sulfamethazine	0.0	(—)	0.5	(0.5)	8.2	(4.2)	0.4	(0.4)	1.2	(1.1)	0.0	(—)	0.0	(—)	10.3	(4.2)
Tetracycline	0.0	(—)	0.2	(0.2)	7.0	(2.7)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.2	(2.7)
Tiamulin	0.0	(—)	1.5	(0.8)	9.3	(4.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	10.8	(4.1)
Trimethoprim/ sulfadiazine	0.0	(—)	2.8	(1.8)	2.8	(1.3)	0.3	(0.3)	0.2	(0.2)	0.0	(—)	0.0	(—)	6.1	(2.3)
Tylosin	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.5)
Virginiamycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above antimicrobial treatments	0.0	(—)	23.3	(5.4)	41.2	(6.2)	22.7	(4.9)	6.9	(2.4)	0.0	(—)	0.9	(0.6)	66.6	(5.5)

Table cont'd →

C.6.b. (cont'd) For sites with nursery pigs, percentage of sites that gave nursery pigs the following medications in **water** for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Piperazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.3)	0.0	(—)	0.4	(0.3)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.3)	0.0	(—)	0.4	(0.3)
Supportive treatment																
Salicylic acid	0.0	(—)	14.9	(6.2)	5.8	(2.1)	0.0	(—)	0.0	(—)	0.0	(—)	4.4	(2.3)	25.0	(7.3)
Vitamin D	0.4	(0.4)	3.9	(1.9)	0.6	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.2	(0.2)	5.2	(2.0)
Vitamin E	0.0	(—)	2.7	(1.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.5)	3.2	(1.5)
Any of the above supportive treatments	0.4	(0.4)	20.3	(6.0)	6.2	(2.2)	0.0	(—)	0.0	(—)	0.0	(—)	5.1	(2.3)	30.9	(7.0)
Other medication	0.4	(0.4)	2.5	(1.7)	0.6	(0.6)	0.5	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	4.0	(1.9)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

As with most water-soluble medications used in the nursery, chlortetracycline was used in water for about 5 days, on average.

C.6.c. For sites that gave nursery pigs the following medications in **water** during the previous 6 months, site average of number of days medication was given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Amoxicillin	5.4	(0.4)
Chlortetracycline	5.5	(0.5)
Gentamicin	5.9	(0.5)
Neomycin	5.1	(0.3)
Oxytetracycline	5.0	(0.4)
Penicillin G potassium	4.8	(0.3)
Sulfadimethoxine	16.9	(6.3)
Sulfamethazine	6.0	(1.0)
Tetracycline	5.4	(0.5)
Tiamulin	4.8	(0.3)
Trimethoprim/sulfadiazine	5.0	(0.2)
Supportive treatment		
Salicylic acid	4.8	(0.3)
Vitamin D	4.7	(1.2)
Vitamin E	5.4	(1.4)
Other medication	5.6	(1.1)

*Estimates not reported for other medications listed in table C.6.b due to small sample size.

C.6.d. For sites that gave nursery pigs any antimicrobials in **water** during the previous 6 months, site average total number of days given, by primary reason antimicrobial was given:

Average Number of Days											
Primary Reason Given											
Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polyserositis meningitis treatment		Parasite treatment/ deworming	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
NA		5.2	(0.4)	6.4	(1.3)	5.0	(0.3)	7.0	(1.6)	NA	

Almost 90 percent of nursery sites administered feed antibiotics to nursery pigs for 1 or more days during the previous 6 months. Almost 70 percent of nursery sites used feed antibiotics to prevent disease and control disease spread in nursery pigs. The two feed antibiotics used by the highest percentages of sites for disease prevention were chlortetracycline and tiamulin (e.g., Denegard). Over 40 percent of nursery sites used carbadox in feed.

C.6.e. For sites with nursery pigs, percentage of sites that gave the following medications in **feed** to nursery pigs for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease preven-tion/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Bacitracin methylene disalicylate	5.6	(2.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	5.6	(2.1)
Bacitracin zinc	0.4	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.4)
Bambermycins	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Carbadox	6.8	(2.3)	16.6	(3.9)	0.0	(—)	20.8	(9.7)	0.0	(—)	0.0	(—)	0.0	(—)	44.3	(7.7)
Carbadox/ oxytetracycline	0.0	(—)	3.3	(1.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.3	(1.4)
Chlortetracycline	2.3	(1.0)	48.5	(7.5)	7.0	(2.6)	1.1	(0.9)	0.0	(—)	0.0	(—)	0.0	(—)	58.9	(6.4)
Chlortetracycline/ sulfathiazole/ penicillin	0.0	(—)	1.3	(0.9)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.4	(0.9)
Chlortetracycline/ sulfamethazine/ penicillin	0.5	(0.5)	4.6	(1.8)	0.3	(0.3)	0.0	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	5.4	(1.9)
Florfenicol	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Lincomycin	0.1	(0.1)	0.4	(0.3)	1.6	(1.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	2.1	(1.1)
Neomycin/ terramycin	0.0	(—)	5.2	(1.8)	0.0	(—)	1.7	(1.5)	0.0	(—)	0.0	(—)	0.0	(—)	6.9	(2.3)
Oxytetracycline	0.0	(—)	2.6	(1.2)	1.1	(0.8)	0.7	(0.7)	0.0	(—)	0.0	(—)	0.0	(—)	4.4	(1.6)
Tiamulin	1.5	(0.8)	45.1	(7.9)	3.3	(1.4)	7.1	(2.9)	0.0	(—)	0.0	(—)	0.0	(—)	57.0	(6.7)
Tilmicosin	0.0	(—)	1.0	(0.6)	4.9	(4.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	5.9	(4.2)
Tylosin	3.5	(1.7)	5.6	(1.7)	0.0	(—)	2.2	(1.1)	0.0	(—)	0.0	(—)	0.0	(—)	11.4	(2.8)
Tylosin/ sulfamethazine	0.0	(—)	2.0	(1.2)	0.0	(—)	0.4	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	2.4	(1.3)
Tylosin/ ractopamine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Virginiamycin	0.0	(—)	0.0	(—)	0.0	(—)	0.3	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.3	(0.3)
Any of the above antimicrobial treatments	14.1	(3.3)	69.4	(5.5)	15.9	(4.9)	27.4	(9.2)	0.0	(—)	0.0	(—)	0.0	(—)	89.4	(3.0)

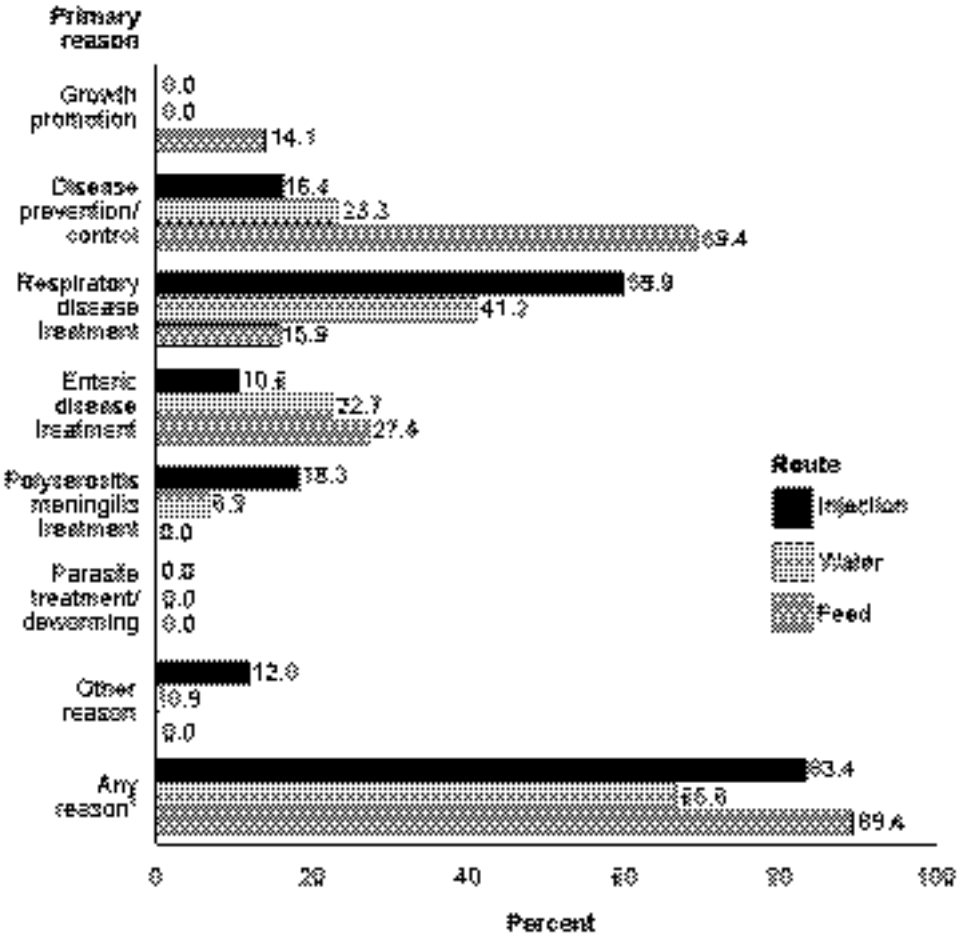
Table cont'd →

C.6.e. (cont'd) For sites with nursery pigs, percentage of sites that gave the following medications in **feed** to nursery pigs for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease preven-tion/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite reatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Dichlorvos	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Fenbendazole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.3	(2.6)	0.0	(—)	7.3	(2.6)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.5)	0.0	(—)	0.5	(0.5)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Pyrantel tartrate	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(0.8)	0.0	(—)	1.2	(0.8)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.8	(2.6)	0.0	(—)	7.8	(2.6)
Other medications																
Ractopamine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Zinc oxide	0.5	(0.4)	1.1	(1.1)	0.0	(—)	1.6	(1.1)	0.0	(—)	0.0	(—)	0.0	(—)	3.2	(1.6)
Other medication	0.0	(—)	1.2	(0.9)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(0.9)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

For sites with nursery pigs, percentage of sites that gave any antimicrobial to nursery pigs during the previous 6 months, by primary reason antimicrobial was given and by route given



[1] It may not sum to "Any reason" antimicrobial use because some of specific treatments by reason

Chlortetracycline and tiamulin were used in nursery feed for 17 days, on average, and carbadox was used in nursery feed for 23 days, on average.

C.6.f. For sites that gave nursery pigs the following medications in **feed** during the previous 6 months, site average of number of days given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Bacitracin methylene disalicylate	21.5	(2.3)
Carbadox	23.4	(3.3)
Carbadox/oxytetracycline	12.1	(1.8)
Chlortetracycline	17.8	(1.5)
Chlortetracycline/sulfamethazine/penicillin	21.8	(6.0)
Lincomycin	20.4	(2.9)
Neomycin/terramycin	13.0	(2.5)
Oxytetracycline	16.8	(2.0)
Tiamulin	17.3	(1.6)
Tylosin	21.9	(2.4)
Tylosin/sulfamethazine	26.2	(7.6)
Parasite treatment		
Fenbendazole	6.6	(0.8)
Supportive treatment		
Zinc oxide	45.8	(7.2)

*Estimates not reported for other medications listed in table C.6.e due to small sample size or no sites gave the medication.

C.6.g. For sites that gave nursery pigs any antimicrobial in **feed** during the previous 6 months, site average number of days given, by primary reason antimicrobial was given:

Average Number of Days													
Primary Reason Given													
Growth promotion		Disease preven-tion/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
23.6	(1.5)	17.4	(1.2)	16.7	(1.5)	25.0	(4.7)	NA		NA		NA	

7. Feed management

More than 40 percent of nursery sites included distiller's dried grain and solubles (DDGS) in at least one nursery pig diet. This percentage was similar across all size groups. Spray-dried plasma and blood meal, serum albumin, or other blood products were used in nursery pig diets on more than 70 percent of large nursery sites. Soybean meal or other vegetable protein sources were used on nearly 90 percent of nursery sites.

C.7.a. Percentage of sites that used the following ingredients in any nursery diet, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ingredient	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Tallow	7.3	(2.5)	6.9	(4.3)	13.2	(7.1)	8.1	(2.2)
Lard or choice white grease	29.9	(7.4)	36.1	(13.9)	53.4	(16.9)	35.0	(8.9)
Other animal fat	17.2	(5.3)	27.1	(14.9)	49.6	(16.9)	24.6	(9.2)
Soybean oil	24.8	(6.0)	30.6	(14.8)	36.0	(21.6)	27.9	(9.3)
Corn oil	1.3	(1.2)	0.0	(0.0)	5.2	(4.1)	1.6	(1.0)
Other vegetable fat	11.3	(4.9)	21.4	(16.2)	44.3	(19.2)	18.8	(9.9)
Molasses	0.0	(0.0)	2.1	(2.0)	0.4	(0.4)	0.6	(0.5)
Spray dried plasma	22.3	(5.5)	58.4	(11.0)	72.0	(11.2)	38.8	(8.1)
Blood meal, serum albumin, or other blood products	16.8	(5.4)	37.6	(13.9)	70.7	(11.8)	30.1	(8.8)
Mucosal products such as dried porcine soluble, PEP products	1.9	(1.9)	0.0	(0.0)	6.9	(4.5)	2.2	(1.3)
Fish meal	21.0	(4.7)	29.7	(8.8)	38.7	(14.4)	25.8	(4.7)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	7.8	(3.2)	7.9	(4.6)	14.4	(7.4)	8.8	(2.6)
Soybean meal or other vegetable protein source	87.2	(4.5)	88.6	(6.8)	90.9	(6.1)	88.1	(3.8)
Other protein sources	14.5	(4.8)	29.5	(14.8)	42.3	(19.7)	22.4	(9.5)
Bakery/food manufacture byproducts	13.1	(4.9)	33.7	(14.7)	35.7	(21.7)	21.6	(9.8)
Distiller's dried grain and solubles (DDGS)	41.3	(7.1)	48.9	(12.2)	44.4	(16.4)	43.6	(7.0)

Distiller's dried grain and solubles were used on almost 60 percent of nursery sites in the Midwest region compared with only 12.4 percent of nursery sites in the South region. Spray-dried plasma was used on more than 70 percent of nursery sites in the South region compared with 32.3 and 18.9 percent in the Midwest and East regions, respectively.

C.7.b. Percentage of sites that used the following ingredients in any nursery diet, by region:

	Percent Sites					
	Region					
	Midwest		East		South	
Ingredient	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Tallow	7.7	(2.5)	9.6	(5.3)	7.5	(5.5)
Lard or choice white grease (pork fat)	30.5	(7.2)	18.1	(7.9)	61.7	(20.8)
Other animal fat	9.5	(3.2)	12.0	(6.9)	71.0	(15.4)
Soybean oil	10.5	(3.1)	27.6	(9.0)	67.5	(18.3)
Corn oil	2.9	(1.8)	0.0	(0.0)	0.0	(0.0)
Other vegetable fat	4.0	(2.1)	8.2	(5.1)	61.9	(20.7)
Molasses	0.0	(0.0)	2.4	(2.2)	0.0	(0.0)
Spray dried plasma	32.3	(5.7)	18.9	(6.1)	72.6	(14.9)
Blood meal, serum albumin, or other blood products	15.2	(3.9)	26.0	(8.6)	67.3	(17.2)
Mucosal products such as dried porcine soluble, PEP products	3.6	(2.4)	0.0	(0.0)	1.4	(1.6)
Fish meal	27.6	(5.1)	35.5	(8.8)	12.4	(7.6)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	12.7	(4.0)	4.1	(2.5)	4.7	(4.2)
Soybean meal or other vegetable protein source	88.7	(4.6)	81.1	(9.5)	93.7	(5.6)
Other protein sources	13.3	(3.6)	2.2	(1.9)	62.6	(19.9)
Bakery/food manufacture byproducts	10.1	(3.4)	12.9	(6.2)	55.9	(23.6)
Distiller's dried grain and solubles (DDGS)	59.4	(6.3)	39.5	(9.8)	12.4	(9.1)

On average, DDGS made up 13.4 percent of the nursery diet on nursery sites that used DDGS.

C.7.c. For sites that used DDGS in any nursery diet, average percentage of DDGS in feed, by size of site:

Average Percent							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
13.3	(1.8)	13.8	(1.6)	12.9	(1.5)	13.4	(1.1)

Roughly half of nursery sites that included DDGS in nursery diets did so at a concentration of 1 to 10 percent. Slightly fewer sites included DDGS at 11 to 20 percent of the diet.

C.7.d. For sites that used DDGS in any nursery diet, percentage of sites by percentage of DDGS in feed, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Percent DDGS	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–10	48.2	(13.8)	50.9	(11.9)	51.5	(14.4)	49.5	(9.0)
11–20	50.6	(14.0)	40.7	(11.6)	48.5	(14.4)	47.5	(9.1)
21–30	1.2	(1.2)	8.4	(7.9)	0.0	(0.0)	3.0	(2.4)
Total	100.0		100.0		100.0		100.0	

C.7.e. For sites that used DDGS in any nursery diet, percentage of sites by percentage of DDGS in feed, and by region:

	Percent Sites					
	Region					
	Midwest		East		South	
Percent DDGS	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
1 to 10	54.5	(11.7)	36.1	(17.8)	46.7	(26.5)
11 to 20	42.0	(11.9)	61.1	(17.6)	53.3	(26.5)
21 to 30	3.4	(3.4)	2.8	(2.8)	0.0	(0.0)
Total	100.0		100.0		100.0	

Overall, sites fed more than three different rations to nursery pigs.

C.7.f. Average number of different rations fed to nursery pigs, by size of site:

Average Number of Rations							
Size of Site (total inventory)							
Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
3.2	(0.1)	3.8	(0.2)	3.7	(0.3)	3.4	(0.1)

More than three-fourths of medium and large nursery sites used three to four different rations for nursery pigs. A higher percentage of small nursery sites used one to two rations than did medium or large nursery sites. Over 15 percent of nursery sites used five to six different rations. On average, nursery sites administered 3.4 different rations for nursery pigs.

C.7.g. Percentage of sites by number of different rations fed to nursery pigs, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Number of different rations	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	26.6	(5.5)	2.2	(2.1)	0.0	(0.0)	16.3	(3.8)
3–4	59.6	(6.6)	77.8	(8.0)	84.8	(7.3)	68.1	(5.7)
5–6	13.7	(4.0)	20.0	(7.6)	14.5	(7.1)	15.5	(3.6)
7 or more	0.0	(0.0)	0.0	(0.0)	0.7	(0.7)	0.1	(0.1)
Total	100.0		100.0		100.0		100.0	

More than three-fourths of nursery sites used at least one pelleted diet. While three-fourths of all nursery sites used at least one meal/mash diet, less than half of large nursery sites did.

C.7.h. Percentage of sites that fed at least one ration of the following type to nursery pigs, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ration	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Meal/mash	84.8	(5.7)	70.8	(15.1)	47.7	(16.9)	75.5	(9.9)
Pellet	73.7	(6.1)	86.7	(6.3)	84.7	(7.8)	78.7	(4.8)
Liquid	0.0	(0.0)	0.0	(0.0)	0.7	(0.7)	0.1	(0.1)
Other	9.1	(3.7)	4.6	(3.2)	0.0	(0.0)	6.6	(2.5)

Overall, more than half of nursery sites fed meal and pelleted diets. More than half of large sites fed only pellet diets to nursery pigs compared with only 7.6 percent of small sites.

C.7.i. Percentage of sites that fed different rations of the following type to nursery pigs, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ration	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Meal/mash only	23.7	(5.8)	13.3	(6.3)	14.7	(7.6)	19.7	(4.7)
Pellet only	7.6	(4.8)	24.5	(15.7)	52.3	(16.9)	18.7	(10.2)
Meal and pellets	59.7	(7.1)	57.5	(13.3)	32.0	(12.6)	54.9	(8.1)
Other	9.1	(3.7)	4.6	(3.2)	1.0	(0.8)	6.7	(2.5)
Total	100.0		100.0		100.0		100.0	

Over two-thirds of small and medium nursery sites mixed the last nursery ration on-site compared with 27.5 percent of large nursery sites.

C.7.j. Percentage of sites by source of last ration fed in the nursery phase, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Mixed by the farm on-site	67.7	(7.7)	67.8	(8.0)	27.5	(9.4)	61.8	(5.5)
Mixed by the farm/ company but off site	1.1	(0.8)	17.8	(7.4)	46.9	(13.0)	11.5	(3.4)
Custom-mixed off farm	21.3	(7.7)	12.3	(4.7)	12.9	(5.9)	18.1	(5.2)
Purchased as a commercial diet	7.9	(3.9)	2.1	(2.1)	12.8	(8.7)	7.4	(3.2)
Other source	2.0	(1.9)	0.0	(0.0)	0.0	(0.0)	1.3	(1.2)
Total	100.0		100.0		100.0		100.0	

On average, a nursery pig ate almost 60 pounds of feed during the nursery phase.

C.7.k. Average total amount of feed (lb/pig on an as-fed basis) nursery pig consumed while in the nursery, by size of site:

Average Total Feed (lb/pig)							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
67.5	(4.3)	56.4	(2.3)	58.6	(3.0)	59.3	(2.5)

On average, bulk feed bins on nursery sites contained 12 days of feed when full, which implies that feed-delivery trucks came approximately every 12 days.

C.7.l. Average number of days until bulk feed bins containing nursery feed would run empty after being filled, by size of site:

Average Number of Days							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
11.2	(1.1)	12.5	(1.8)	14.5	(3.2)	12.1	(1.5)

8. Outshipments

Small nursery sites had shipped pigs to a grower/finisher site an average 3.6 times during the previous 6 months, which equates to about one shipment every 7 weeks. Large nursery sites shipped pigs to a grower/finisher site an average 21.1 times during the previous 6 months, or about once a week.

C.8.a. Average number of shipments of pigs that left the nursery during the previous 6 months, by destination and by size of site:

	Average Number of Shipments							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
Grower/finisher site	3.6	(0.6)	15.5	(5.3)	21.1	(2.2)	9.7	(1.7)
Slaughter plant as culled pigs	0.4	(0.4)	0.1	(0.1)	0.6	(0.6)	0.4	(0.2)
Auction/ livestock market	0.0	(0.0)	0.1	(0.1)	0.0	(—)	0.0	(0.0)
Other	1.2	(0.8)	0.2	(0.2)	0.3	(0.2)	0.8	(0.5)

C.8.b. Average distance (miles) to the **closest** destination of pig shipments that left the nursery during the previous 6 months, by destination:

Destination	**Average distance** (mi)	**Std. error**
Grower/finisher site	17.5	(6.6)
Slaughter plant as culled pigs	64.2	(40.4)
Auction/livestock market	*	
Other	47.1	(18.2)

*Too few observations to report.

C.8.c. Average distance (miles) to the **farthest** destination of pig shipments that left the nursery during the previous 6 months, by destination:

Destination	**Average distance** (mi)	**Std. error**
Grower/finisher site	43.6	(15.1)
Slaughter plant as culled pigs	74.3	(44.7)
Auction/livestock market	*	
Other	129.2	(31.0)

*Too few observations to report.

C.8.d. Percentage of sites that had any shipments of nursery aged pigs during the previous 6 months, by destination and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Grower/finisher site	76.6	(6.1)	86.7	(5.2)	94.9	(2.8)	82.3	(4.3)
Slaughter plant as culled pig	1.6	(1.5)	2.5	(2.0)	2.3	(2.3)	1.9	(1.1)
Auction/ livestock market	0.7	(0.7)	0.6	(0.6)	0.0	(----)	0.6	(0.4)
Other	5.9	(2.5)	4.2	(3.0)	0.9	(0.6)	4.6	(1.7)

C.8.e. For sites that had any shipments of nursery age pigs during the previous 6 months, percentage of sites that had at least one shipment leave the nursery and cross State lines, by destination:

Destination	Percent sites	Std. error
Grower/finisher site	8.1	(3.4)
Slaughter plant as culled pigs	20.2	(19.2)
Auction/livestock market	*	
Other	36.0	(20.5)

*Too few observations to report.

D. Grower/ Finisher Phase

Note: All tables in section D refer to sites with grower/finisher pigs. Herd sizes are based on total inventory.

1. Disease problems

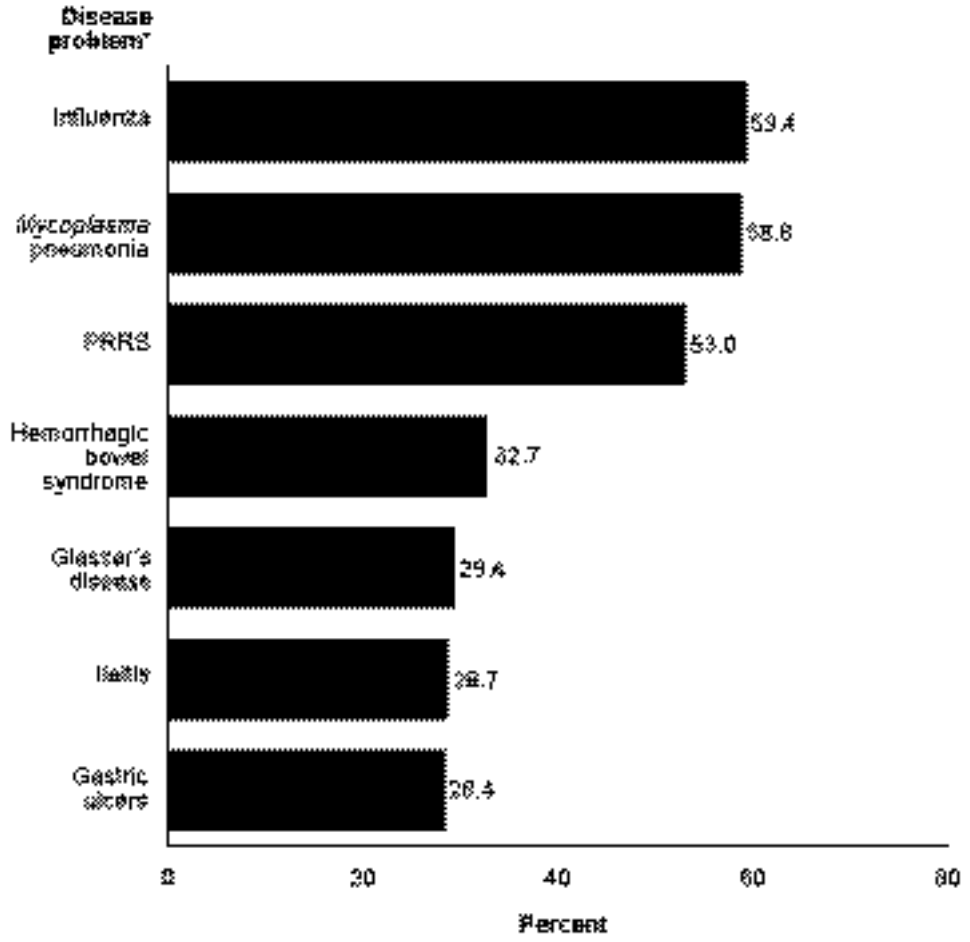
More than half of grower/finisher sites reported problems with influenza, PRRS, and *Mycoplasma* pneumonia in grower/finisher pigs. Over one-fourth of grower/finisher sites reported problems with hemorrhagic bowel syndrome, ileitis, and gastric ulcers. Over one-tenth of small sites with grower/finisher pigs reported a problem with mange.

D.1.a. Percentage of sites in which the following disease problems were present in grower/finisher pigs during the previous 12 months, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Disease problem*	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Influenza	53.1	(5.8)	61.4	(7.9)	71.9	(9.2)	59.4	(5.3)
Mycoplasma pneumonia	38.1	(5.6)	78.0	(6.8)	57.4	(12.3)	58.8	(6.6)
PRRS	30.6	(5.9)	71.7	(7.6)	58.7	(16.3)	53.0	(6.6)
Hemorrhagic bowel syndrome	31.5	(5.0)	36.0	(12.4)	24.8	(14.7)	32.7	(7.8)
Glasser's disease	12.7	(3.9)	45.8	(11.3)	25.4	(10.4)	29.4	(7.1)
Ileitis	33.2	(5.1)	25.9	(6.6)	24.3	(9.3)	28.7	(5.0)
Gastric ulcers	22.9	(5.4)	34.2	(7.5)	25.8	(9.1)	28.4	(5.5)
PCVAD	14.1	(4.5)	12.2	(4.8)	17.2	(9.6)	13.7	(3.5)
Roundworms	18.3	(3.7)	2.4	(1.2)	0.8	(0.7)	8.8	(2.1)
Atrophic rhinitis	5.7	(2.1)	3.4	(2.2)	14.8	(10.8)	5.9	(2.5)
Salmonella	3.1	(1.3)	4.0	(2.1)	18.8	(10.2)	5.6	(2.1)
Mange	10.4	(2.9)	0.2	(0.2)	0.0	(0.0)	4.4	(1.4)
Swine dysentery	4.3	(1.7)	5.1	(2.5)	1.7	(1.6)	4.3	(1.5)
APP	4.4	(2.4)	5.1	(3.9)	1.4	(0.9)	4.3	(2.7)
Lice	7.2	(2.6)	0.2	(0.2)	0.0	(0.0)	3.1	(1.2)
Erysipelas	0.9	(0.8)	3.7	(2.6)	5.0	(3.7)	2.7	(1.3)
PDNS	0.0	(0.0)	3.9	(2.8)	2.4	(1.8)	2.1	(1.4)
Other	3.2	(1.2)	5.6	(2.8)	1.5	(0.8)	4.0	(1.4)

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

Percentage of sites in which the following disease problems were present in grower/finisher pigs during the previous 12 months



*This graph includes problems observed, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

Morbidity rate, in this case measured as the percentage of grower/finisher pigs affected in a group, was above 40 percent for influenza and PRRS. Disease problems with low morbidity (<10 percent) included Glasser's disease, *Salmonella*, swine dysentery, hemorrhagic bowel syndrome, ileitis, gastric ulcers, erysipelas, PCVAD, PDNS, mange, and lice.

D.1.b. For sites in which the following disease problems were present in grower/finisher pigs during the previous 12 months, percentage grower/finisher pigs affected during the most recent occurrence of disease, by disease problem and by size of site:

	Percent pigs							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Disease problem[1]	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Influenza	29.7	(6.2)	46.5	(12.3)	42.4	(9.3)	43.0	(9.2)
Mycoplasma pneumonia	22.5	(4.2)	19.1	(6.1)	32.0	(12.2)	27.8	(10.2)
PRRS	30.2	(2.7)	44.0	(9.0)	50.5	(7.2)	47.6	(5.9)
Hemorrhagic bowel syndrome	4.9	(1.7)	4.3	(0.7)	4.5	(0.5)	4.5	(0.5)
Glasser's disease	8.9	(2.3)	7.8	(1.3)	7.7	(2.1)	7.8	(1.5)
Ileitis	7.3	(1.7)	9.2	(2.5)	5.1	(1.0)	6.0	(1.1)
Gastric ulcers	3.9	(0.7)	2.7	(0.7)	1.2	(0.2)	2.1	(0.6)
PCVAD	33.0	(2.2)	11.8	(7.1)	3.2	(1.0)	7.1	(3.4)
Roundworms	40.6	(12.6)	5.1	(5.4)	[2]		10.2	(6.4)
Atrophic rhinitis	3.0	(0.7)	13.6	(7.5)	[2]		27.3	(2.7)
Salmonella	4.4	(0.7)	5.1	(3.7)	5.3	(1.1)	5.2	(1.3)
Mange	28.0	(9.2)	[2]		[2]		2.7	(2.9)
Swine dysentery	[2]		4.3	(3.4)	[2]		5.5	(4.2)
APP	[2]		35.0	(29.4)	[2]		32.3	(25.2)
Lice	26.3	(14.9)	[2]		[2]		1.2	(1.5)
Erysipelas	[2]		0.9	(0.8)	[2]		0.9	(0.6)
PDNS	[2]		2.3	(1.2)	[2]		2.8	(1.2)
Other	[2]		1.0	(0.7)	[2]		2.5	(1.4)

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

2. Swine dysentery

For the 4.3 percent of sites that reported problems with swine dysentery, the case fatality rate for swine dysentery in the grower/finisher phase was 1.5 percent, although the percentage was substantially higher for small sites than large sites.

D.2. For sites in which swine dysentery was present in grower/finisher pigs during the previous 12 months, site average percentage of pigs treated and percentage that died, by size of site:

	Average Percent							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Treated	77.7	(13.4)	97.1	(3.2)	100.0	(0.0)	89.2	(6.7)
Died	2.2	(0.8)	1.1	(1.0)	0.0	(0.0)	1.5	(0.7)

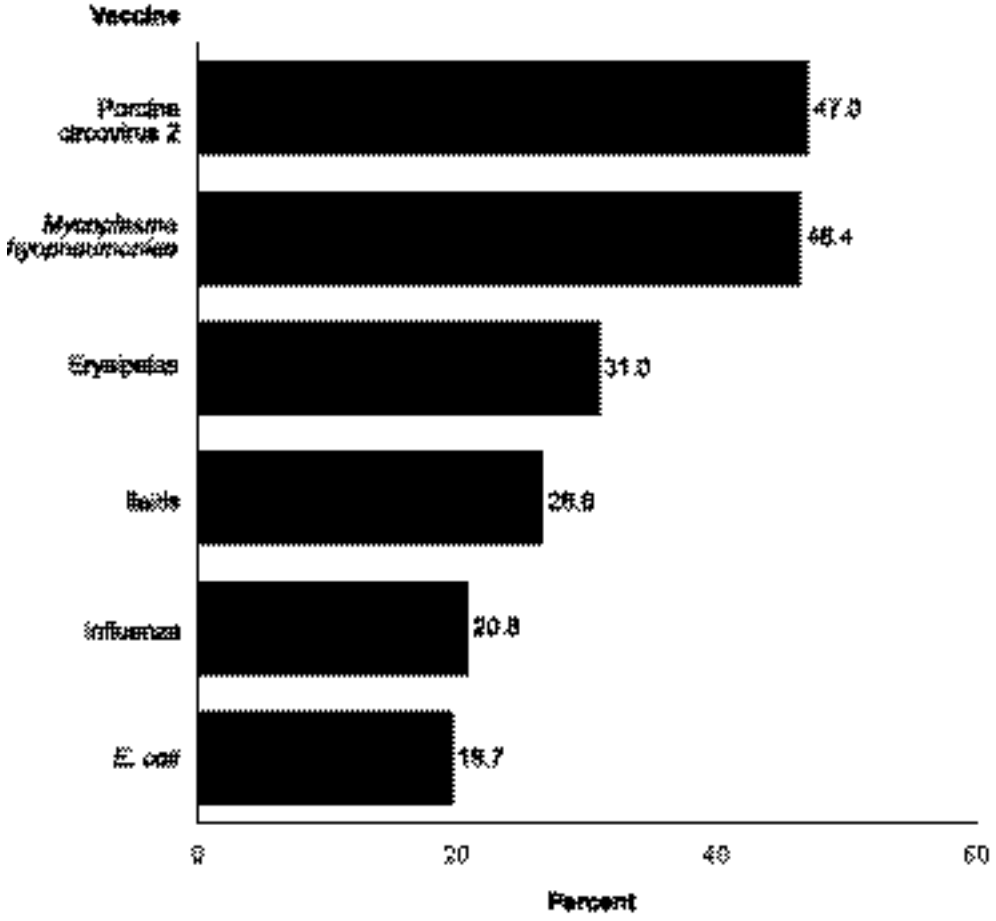
3. Vaccination practices

Almost half of grower/finisher sites vaccinated pigs for PCV2 and *Mycoplasma hyopneumoniae*.

D.3. Percentage of sites that vaccinated grower/finisher pigs against the following diseases at any time during the previous 12 months:

Vaccine	Percent sites	Std. error
APP	1.4	(0.6)
Actinobacillus suis	0.6	(0.3)
Atrophic rhinitis	3.7	(1.2)
C. difficile	11.1	(8.5)
C. perfringens type A	11.3	(8.5)
C. perfringens types C and D	1.2	(0.7)
Erysipelas	31.0	(8.0)
E. coli (K88, K99, 987P, F41)	19.7	(8.4)
Glasser's disease	5.3	(2.5)
Ileitis/proliferative enteritis	26.6	(8.2)
Influenza	20.8	(8.3)
Leptospirosis	1.6	(0.7)
Mycoplasma hyopneumoniae	46.4	(7.9)
Porcine circovirus 2	47.0	(7.8)
PRRS	8.5	(2.3)
Salmonella	6.2	(2.5)
TGE	0.0	(—)
Other	0.3	(0.3)

Percentage of sites that vaccinated grower/finisher pigs against the following diseases at any time during the previous 12 months



4. Influenza vaccination

Only 4.4 percent of grower/finisher sites vaccinated pigs against influenza with two or more doses. The average age of pigs receiving the first dose of influenza vaccine was 7.9 weeks.

D.4.a. Percentage of sites that gave pigs second and third doses of influenza vaccine, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Dose	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Second	1.6	(1.3)	2.6	(2.0)	11.4	(8.9)	3.4	(2.3)
Third	0.0	(0.0)	1.6	(1.5)	2.1	(2.0)	1.0	(0.9)

D.4.b. Site average age of pigs (in weeks) when receiving first, second, and third dose of influenza vaccine:

Dose	Average age of pigs (wk)	Std. error
First	7.9	(0.6)
Second	12.0	(0.0)
Third	15.0	(0.0)

On the 20.8 percent of grower/finisher sites that vaccinated pigs against influenza, almost 100 percent of grower/finisher pigs received an autogenous influenza vaccine.

D.4.c. For sites that usually vaccinated pigs against influenza during the grower/finisher phase, percentage of sites by influenza vaccine used in grower/finisher pigs during the previous 12 months and percentage of all grower/finisher pigs on those sites:

Influenza vaccine	Percent sites	Std. error	Percent grower/ finisher pigs	Std. error
Commercial influenza vaccine (killed)	21.1	(11.0)	15.0	(9.5)
Autogenous influenza vaccine (killed)	91.8	(6.6)	98.8	(1.3)

5. Response to respiratory disease outbreak

Almost two-thirds of grower/finisher sites that had a respiratory disease outbreak during the previous 12 months treated the whole room (all pigs in shared airspace with ill pigs). Over one-fifth of sites treated only ill pigs, and just 2.4 percent did not treat any pigs with antibiotics.

D.5. Percentage of sites by action that best describes what was done during the most recent respiratory disease outbreak in grower/finisher pigs during the previous 12 months, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Action	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Did not have clinical respiratory disease in nursery pigs in last 12 months	13.2	(3.1)	4.5	(1.9)	8.5	(3.8)	8.6	(2.0)
Did not treat any pigs with antibiotics	4.9	(2.3)	0.6	(0.4)	1.2	(1.2)	2.4	(1.1)
Treated only clinically ill pigs with antibiotics	21.9	(4.6)	26.0	(8.6)	17.3	(9.7)	23.1	(5.4)
Treated all pigs in same pen with clinically ill pigs with antibiotics	3.5	(1.5)	0.0	(0.0)	0.0	(0.0)	1.4	(0.7)
Treated all pigs in same pen and pens adjacent to clinically ill pigs with antibiotics	1.7	(1.2)	0.9	(0.9)	0.0	(0.0)	1.1	(0.7)
Treated all pigs in entire room with clinically ill pigs with antibiotics (all pigs with shared airspace)	54.9	(5.7)	68.1	(8.6)	73.0	(11.3)	63.3	(6.3)
Total	100.0		100.0		100.0		100.0	

6. Medications given by injection, in water, and in feed

Over 80 percent of grower/finisher sites had administered injectable antibiotics to one or more pigs during the previous 6 months. Over 70 percent of grower/finisher sites used injectable antibiotics to treat respiratory disease. The highest percentages of sites used ceftiofur (e.g., Excede) and enrofloxacin (e.g., Baytril 100) to treat respiratory disease.

D.6.a. For sites with grower/finisher pigs, percentage of sites that gave the following medications by **injection** to one or more pigs during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.
Antimicrobial treatment																
Ampicillin	0.0	(—)	0.1	(0.1)	1.3	(0.6)	0.0	(—)	0.2	(0.2)	0.0	(—)	0.7	(0.5)	2.3	(0.8)
Amoxicillin	0.0	(—)	0.0	(—)	0.3	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.3	(0.3)
Ceftiofur	0.1	(0.1)	1.4	(0.8)	34.6	(8.5)	1.0	(1.0)	0.9	(0.5)	0.0	(—)	0.0	(—)	38.0	(8.4)
Enrofloxacin	0.0	(0.0)	2.2	(1.7)	34.7	(9.0)	0.3	(0.2)	0.1	(0.1)	0.0	(—)	1.0	(1.0)	38.4	(8.8)
Erythromycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Florfenicol	0.0	(—)	0.0	(—)	4.0	(1.6)	0.0	(0.0)	0.4	(0.4)	0.0	(—)	0.0	(—)	4.4	(1.7)
Gentamycin	0.0	(—)	0.0	(—)	0.0	(—)	0.1	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.1	(0.1)
Lincomycin	0.0	(—)	2.0	(1.8)	4.7	(2.3)	1.0	(0.7)	0.2	(0.1)	0.0	(—)	3.4	(2.3)	11.2	(3.9)
Oxytetracycline	0.0	(—)	0.7	(0.5)	15.3	(8.1)	0.4	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	16.5	(8.1)
Penicillin benzathine	0.0	(—)	0.2	(0.1)	3.5	(1.7)	0.0	(—)	0.3	(0.2)	0.0	(—)	0.5	(0.4)	4.4	(1.8)
Penicillin G potassium	0.3	(0.3)	5.4	(1.7)	16.1	(4.0)	1.0	(1.0)	4.7	(1.9)	0.0	(—)	5.9	(2.0)	33.5	(6.0)
Tulathromycin	0.0	(—)	1.4	(0.9)	2.5	(1.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.3	(0.3)	4.1	(1.6)
Tylosin	0.0	(—)	1.4	(0.9)	3.2	(1.3)	3.7	(1.1)	0.0	(—)	0.0	(—)	0.3	(0.3)	8.6	(2.4)
Any of the above antimicrobials	0.5	(0.3)	8.9	(3.2)	72.8	(5.2)	6.2	(1.8)	6.5	(2.0)	0.0	(—)	10.8	(3.3)	82.2	(4.6)

Table cont'd →

D.6.a. (cont'd) For sites with grower/finisher pigs, percentage of sites that gave the following medications by **injection** to one or more pigs during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.5	(0.9)	0.0	(—)	1.5	(0.9)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.3	(0.3)	0.0	(—)	0.3	(0.3)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.7)	0.0	(—)	0.7	(0.7)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	2.5	(1.2)	0.0	(—)	2.5	(1.2)
Supportive treatment																
Dexamethasone	0.0	(—)	0.4	(0.3)	2.0	(0.8)	0.0	(—)	1.3	(0.7)	0.0	(—)	4.3	(2.2)	8.0	(2.6)
Flunixin meglumine	0.0	(—)	0.1	(0.1)	0.3	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.4)	1.1	(0.5)
Isoflupredone	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.7	(1.3)	1.7	(1.3)
Vitamin A, D, E	0.0	(—)	0.0	(—)	0.2	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.2	(0.1)
Any of the above supportive treatments	0.0	(—)	0.5	(0.4)	2.4	(0.9)	0.0	(—)	1.3	(0.7)	0.0	(—)	6.3	(2.5)	10.2	(2.7)
Other medication	0.0	(—)	0.0	(—)	0.2	(0.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.2	(0.2)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

About 75 percent of grower/finisher sites had administered water-soluble antibiotics to pigs for 1 or more days during the previous 6 months. Almost two-thirds of grower/finisher sites (32.2 percent) used water-soluble antibiotics to treat respiratory disease. Chlortetracycline was used by the highest percentage of sites to treat respiratory disease. More than 15 percent of grower/finisher sites used water-soluble antibiotics to treat pigs for enteric disease, and less than 12 percent used water-soluble antibiotics for disease control and prevention.

D.6.b. For sites with grower/finisher pigs, percentage of sites that gave grower/finisher pigs the following medications in **water** for 1 or more days during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Amoxicillin	0.2	(0.2)	4.2	(1.7)	11.0	(6.0)	0.0	(—)	0.7	(0.4)	0.0	(—)	0.0	(0.0)	16.1	(6.1)
Bacitracin	0.1	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.1	(0.1)
Chlortetracycline	0.0	(—)	2.3	(1.2)	32.2	(7.4)	0.0	(—)	0.4	(0.4)	0.0	(—)	0.0	(—)	34.9	(7.4)
Chlortetracyline/sul-phamethazine	0.0	(—)	0.2	(0.2)	0.8	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.0	(0.6)
Florfenicol	0.0	(—)	0.0	(—)	0.6	(0.4)	0.0	(—)	0.1	(0.1)	0.0	(—)	0.0	(—)	0.7	(0.4)
Gentamicin	0.0	(—)	1.5	(1.0)	1.0	(0.6)	1.5	(1.0)	0.0	(—)	0.0	(—)	0.0	(—)	3.9	(1.6)
Lincomycin	0.0	(—)	1.1	(0.9)	5.5	(1.9)	0.4	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	7.0	(2.4)
Lincomycin/ spectinomycin	0.0	(—)	0.0	(—)	0.4	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.4)
Neomycin	0.0	(—)	0.4	(0.3)	0.1	(0.1)	4.4	(1.6)	0.0	(—)	0.0	(—)	0.0	(—)	4.8	(1.6)
Oxytetracycline	0.0	(—)	1.7	(1.0)	15.1	(8.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	16.8	(8.3)
Penicillin G potassium	0.0	(—)	1.1	(1.0)	2.5	(1.2)	0.0	(—)	0.1	(0.1)	0.0	(—)	0.0	(—)	3.7	(2.0)
Spectinomycin	0.0	(—)	0.0	(—)	0.6	(0.6)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.6)
Sulfachlorpyridazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Sulfadimethoxine	0.0	(—)	0.1	(0.1)	8.7	(3.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	8.9	(3.3)
Sulfamethazine	0.0	(—)	1.3	(1.2)	4.9	(3.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	6.2	(4.4)
Tetracycline	0.0	(—)	0.7	(0.3)	5.4	(2.1)	0.0	(—)	0.3	(0.2)	0.0	(—)	0.0	(—)	6.4	(2.1)
Tiamulin	0.0	(—)	3.5	(1.5)	20.5	(7.9)	10.1	(7.1)	0.2	(0.2)	0.0	(—)	0.0	(—)	34.3	(8.2)
Trimethoprim/ sulfadiazine	0.0	(—)	1.5	(1.0)	0.0	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.5	(1.0)
Tylosin	0.0	(—)	0.3	(0.2)	0.0	(—)	1.7	(0.7)	0.0	(—)	0.0	(—)	0.0	(—)	2.0	(0.8)
Virginiamycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above antimicrobials	0.3	(0.2)	11.8	(3.1)	64.2	(6.2)	17.1	(6.7)	1.5	(0.7)	0.0	(—)	0.0	(0.0)	74.3	(4.8)

Table cont'd →

D.6.b. (cont'd) For sites with grower/finisher pigs, percentage of sites that gave grower/finisher pigs the following medications in **water** for 1 or more days during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Piperazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.4	(1.3)	0.0	(—)	3.4	(1.3)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.4	(1.3)	0.0	(—)	3.4	(1.3)
Supportive treatment																
Salicylic acid	0.0	(—)	10.0	(4.4)	27.7	(7.7)	0.0	(—)	0.0	(—)	0.0	(—)	3.3	(2.1)	41.0	(8.7)
Vitamin D	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Vitamin E	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above supportive treatments	0.0	(—)	10.0	(4.4)	27.7	(7.7)	0.0	(—)	0.0	(—)	0.0	(—)	3.3	(2.1)	41.0	(8.7)
Other medication	0.0	(—)	0.3	(0.3)	0.1	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.3)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

Most water-soluble antibiotics were given an average of 5 to 6 days. Chlortetracycline was given in water for almost 6 days, on average.

D.6.c. For sites that gave grower/finisher pigs the following medications in **water** during the previous 6 months, site average number of days given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Amoxicillin	5.7	(0.6)
Chlortetracycline	5.9	(0.4)
Gentamicin	5.0	(0.6)
Lincomycin	5.4	(0.3)
Neomycin	5.6	(0.3)
Oxytetracycline	5.2	(0.2)
Penicillin G potassium	5.0	(0.5)
Sulfadimethoxine	8.5	(3.1)
Sulfamethazine	4.8	(0.2)
Tetracycline	5.2	(0.3)
Tiamulin	5.4	(0.3)
Tylosin	4.6	(0.4)
Parasite treatment		
Piperazine	1.7	(0.3)
Supportive treatment		
Salicylic acid	5.8	(0.6)

*Estimates not reported for other medications listed in table D.6.b due to small sample size or no sites gave the medication.

D.6.d. For sites that gave grower/finisher pigs any antimicrobial in **water** during the previous 6 months, site average of the number of days given, by primary reason given:

Average Number of Days													
Primary Reason Given													
Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
*		5.2	(0.3)	5.9	(0.5)	5.1	(0.3)	6.4	(0.7)	NA		*	

*Too few to report.

Over 90 percent of grower/finisher sites had administered antimicrobials to pigs in feed for 1 or more days during the previous 6 months. Over 60 percent of sites used feed antibiotics to prevent disease, control disease spread, and for growth promotion. The two feed antibiotics used for disease control and prevention by the highest percentages of sites were chlortetracycline and tiamulin (e.g., Denegard). Overall, half of grower/finisher sites used antibiotics in feed for growth promotion. The two feed antibiotics used for growth promotion by the highest percentages of sites were virginiamycin and bacitracin methylene disalicylate. Just over one-fourth of sites used ractopamine for growth promotion.

D.6.e. For sites with grower/finisher pigs, percentage of sites that gave pigs the following medications in **feed** for 1 or more days during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Bacitracin methylene disalicylate	20.5	(7.0)	2.1	(0.8)	0.0	(—)	0.6	(0.5)	0.0	(—)	0.0	(—)	0.0	(—)	23.2	(6.9)
Bacitracin zinc	9.7	(8.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	9.7	(8.3)
Bambermycins	1.8	(1.2)	5.2	(4.5)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.0	(5.5)
Carbadox	1.3	(1.0)	1.5	(0.6)	0.0	(—)	0.9	(0.7)	0.0	(—)	0.0	(—)	0.0	(—)	3.8	(1.5)
Carbadox/ oxytetracycline	0.0	(—)	0.0	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(0.0)
Chlortetracycline	1.3	(0.7)	31.4	(7.5)	8.6	(2.3)	0.1	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	41.4	(7.9)
Chlortetracycline/ sulfathiazole/ penicillin	0.1	(0.1)	0.4	(0.3)	0.2	(0.2)	0.0	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.4)
Chlortetracycline/ sulfamethazine/ penicillin	0.0	(—)	1.7	(0.9)	1.4	(1.1)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.1	(1.4)
Florfenicol	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Lincomycin	0.1	(0.1)	11.6	(4.6)	1.4	(0.7)	0.0	(—)	0.0	(0.0)	0.0	(—)	0.2	(0.2)	13.4	(4.7)
Neomycin/ terramycin	0.0	(—)	0.7	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.7	(0.4)
Oxytetracycline	0.3	(0.3)	1.8	(0.7)	1.5	(0.9)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.5	(1.2)
Tiamulin	0.1	(0.1)	28.3	(8.6)	1.4	(1.3)	1.2	(0.6)	0.0	(—)	0.3	(0.2)	0.0	(—)	31.2	(8.4)
Tilmicosin	0.0	(—)	0.5	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.5	(0.4)
Tylosin	7.0	(2.1)	9.1	(2.2)	0.2	(0.2)	6.2	(1.9)	0.0	(—)	0.0	(—)	0.0	(—)	22.5	(4.4)
Tylosin/ sulfamethazine	0.6	(0.5)	3.8	(2.1)	0.0	(—)	0.1	(0.1)	0.0	(—)	0.0	(—)	0.0	(—)	4.6	(2.1)
Tylosin/ ractopamine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Virginiamycin	22.6	(8.2)	7.0	(4.5)	0.8	(0.5)	0.4	(0.3)	0.0	(—)	0.0	(—)	0.8	(0.6)	31.5	(8.2)
Any of the above antimicrobials	50.8	(7.2)	62.2	(7.5)	12.0	(2.8)	8.6	(2.2)	0.0	(0.0)	0.3	(0.2)	1.0	(0.6)	91.2	(2.0)

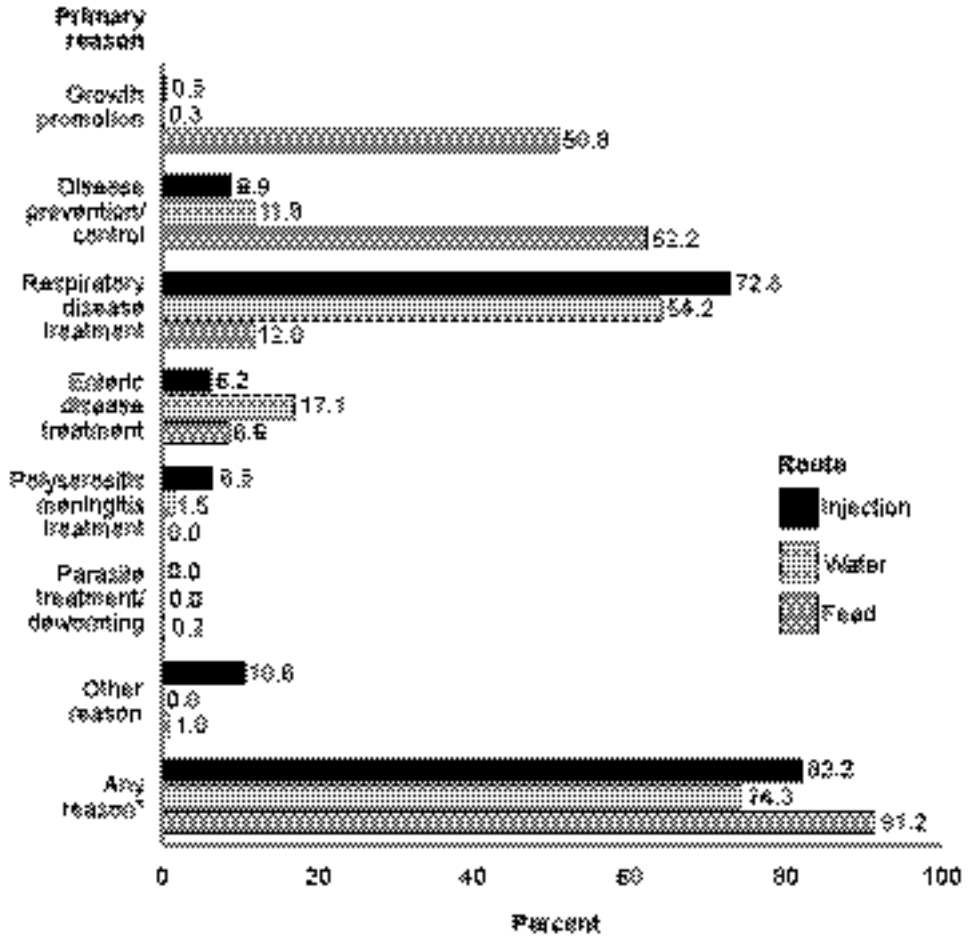
Table cont'd →

D.6.e. (cont'd) For sites with grower/finisher pigs, percentage of sites that gave pigs the following medications in **feed** for 1 or more days during the previous 6 months, by primary reason given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Dichlorvos	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Fenbendazole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	10.1	(2.5)	0.0	(—)	10.1	(2.5)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.9	(0.5)	0.0	(—)	0.9	(0.5)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Pyrantel tartrate	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.3	(0.6)	0.0	(—)	1.3	(0.6)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	11.8	(2.8)	0.0	(—)	11.8	(2.8)
Other treatment																
Ractopamine	28.7	(6.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	28.7	(6.2)
Zinc oxide	0.0	(—)	0.0	(—)	0.0	(—)	1.1	(0.8)	0.0	(—)	0.0	(—)	0.0	(—)	1.1	(0.8)
Other medication	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

*Total may not sum to "Any Reason" estimate due to rounding of specific treatments by reason.

For sites with grower/finisher pigs, percentage of sites that gave any antimicrobial to pigs during the previous 6 months, by primary reason given and by route given



*Total may not equal "any reason" estimate due to rounding of separately reported by reason.

Chlortetracycline and tiamulin were used for disease prevention in grower/finisher feed for an average of 16.8 and 19.2 days, respectively. Virginiamycin and bacitracin methylene disalicylate were used in grower/finisher feed for an average of 70.7 and 65.3 days, respectively.

D.6.f. For sites that gave grower/finisher pigs the following medications in **feed** during the previous 6 months, site average number of days given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Bacitracin methylene disalicylate	65.3	(13.6)
Bacitracin zinc	109.0	(1.3)
Bambermycins	35.8	(5.9)
Carbadox	21.9	(2.9)
Chlortetracycline	16.8	(1.6)
Chlortetracycline/sulfathiazole/penicillin	5.9	(2.4)
Chlortetracycline/sulfamethazine/penicillin	17.2	(5.8)
Lincomycin	12.7	(1.9)
Oxytetracycline	13.4	(3.9)
Tiamulin	19.2	(2.4)
Tylosin	43.4	(4.5)
Tylosin/sulfamethazine	61.3	(21.3)
Virginiamycin	70.7	(17.9)
Parasite treatment		
Fenbendazole	8.8	(1.9)
Supportive treatment		
Ractopamine	23.8	(1.3)

*Estimates not reported for other medications listed in table D.6.e due to small sample size or no sites gave the medication.

D.6.g. For sites that gave grower/finisher pigs any antimicrobial in **feed** during the previous 6 months, site average number of days given, by primary reason given:

Site Average Number of Days															
Primary Reason Given															
Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
74.0	(9.7)	22.8	(2.6)	19.5	(4.8)	24.4	(5.1)	*		*		*	

*Too few to report.

7. Feed management

Almost 80 percent of grower/finisher sites used dried grain and solubles (DDGS) in at least one diet. This percentage was similar across all size groups. Spray-dried plasma and blood meal, serum albumin, or other blood products were used in grower/finisher diets on almost 12 percent of large sites.

D.7.a. Percentage of sites that used the following ingredients in any grower/finisher diet, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ingredient	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Tallow	9.0	(4.1)	16.5	(10.1)	33.7	(18.0)	15.7	(8.6)
Lard or choice white grease	15.6	(4.4)	35.3	(12.0)	27.8	(14.0)	26.2	(7.1)
Other animal fat	7.0	(3.0)	41.7	(13.1)	35.5	(16.2)	26.5	(9.0)
Soybean oil	4.1	(1.9)	3.5	(1.9)	0.3	(0.2)	3.3	(1.2)
Corn oil	2.3	(1.3)	0.5	(0.4)	0.7	(0.4)	1.3	(0.6)
Other vegetable fat	4.8	(2.7)	35.3	(13.0)	22.5	(15.0)	21.0	(8.9)
Molasses	0.0	(0.0)	2.3	(2.3)	0.0	(0.0)	1.0	(1.0)
Spray dried plasma	1.6	(1.3)	2.6	(2.0)	11.5	(9.0)	3.4	(2.4)
Blood meal, serum albumin, or other blood products	2.6	(1.5)	3.9	(2.3)	11.8	(9.1)	4.5	(2.4)
Mucosal products such as dried porcine soluble, PEP products	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Fish meal	2.1	(1.1)	1.3	(0.8)	0.7	(0.7)	1.6	(0.6)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	7.0	(2.3)	7.7	(3.6)	2.1	(1.6)	6.7	(2.2)
Soybean meal or other vegetable protein source	91.5	(2.9)	96.3	(2.3)	86.1	(9.5)	92.9	(2.9)
Other protein sources	4.7	(1.9)	2.7	(2.1)	16.6	(9.9)	5.4	(2.6)
Bakery/food manufacture byproducts	10.9	(4.5)	37.2	(13.3)	24.8	(18.8)	24.7	(9.6)
Distiller's dried grain and solubles (DDGS)	65.6	(4.7)	89.5	(3.2)	80.5	(10.1)	78.4	(4.1)

A higher percentage of sites in the South region than in the Midwest and East regions used lard or choice white grease and other animal fat in any grower/finisher diet.

D.7.b. Percentage of sites that used the following ingredients in any grower/finisher diet, by region:

	Percent Sites					
	Region					
	Midwest		East		South	
Ingredient	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Tallow	3.0	(1.3)	44.0	(22.0)	16.1	(13.5)
Lard or choice white grease	21.7	(6.5)	13.9	(10.1)	57.0	(15.6)
Other animal fat	21.0	(13.3)	8.4	(8.1)	69.0	(8.7)
Soybean oil	3.0	(1.2)	6.5	(4.4)	0.0	(0.0)
Corn oil	1.7	(0.9)	0.0	(0.0)	2.0	(2.1)
Other vegetable fat	21.2	(13.3)	0.0	(0.0)	49.5	(12.9)
Molasses	1.8	(1.8)	0.0	(0.0)	0.0	(0.0)
Spray dried plasma	0.0	(0.0)	8.4	(8.1)	7.0	(7.4)
Blood meal, serum albumin, or other blood products	1.9	(0.9)	8.4	(8.1)	7.0	(7.4)
Mucosal products such as dried porcine soluble, PEP products	0.0	(—)	0.0	(—)	0.0	(—)
Fish meal	1.5	(0.7)	1.4	(1.2)	1.9	(2.0)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	9.3	(3.3)	5.6	(4.7)	0.1	(0.1)
Soybean meal or other vegetable protein source	94.5	(2.5)	91.1	(8.2)	90.8	(8.2)
Other protein sources	2.6	(1.2)	9.9	(8.4)	8.0	(7.8)
Bakery/food manufacture byproducts	8.7	(4.8)	47.0	(21.1)	43.5	(22.3)
Distiller's dried grain and solubles (DDGS)	85.9	(3.3)	71.7	(13.4)	64.7	(12.5)

On average, DDGS made up 21.8 percent of the grower/finisher diet on sites using DDGS.

D.7.c. For sites that used DDGS in grower/finisher diets, average percentage of DDGS in feed, by size of site:

Average Percent							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
18.5	(1.6)	22.7	(3.7)	26.0	(2.6)	21.8	(2.5)

For small sites with a grower/finisher phase, 30.7 percent included DDGS in a diet at a concentration of 1 to 10 percent compared with 2.8 percent of large sites. About 30 percent of grower/finisher sites included DDGS at an 11- to 20-percent concentration, and about 30 percent included it at 21 to 30 percent concentration. More than one-fifth of medium and large sites included DDGS at a concentration exceeding 30 percent of the diet.

D.7.d. For sites that used DDGS in grower/finisher diets, percentage of sites by percentage of DDGS in feed, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Percent DDGS	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–10	30.7	(6.8)	26.1	(15.4)	2.8	(1.5)	24.2	(9.3)
11–20	40.1	(7.3)	19.8	(7.5)	35.3	(18.1)	28.8	(7.7)
21–30	25.3	(8.0)	31.2	(12.5)	40.6	(21.1)	30.6	(10.8)
More than 30	3.9	(3.8)	22.9	(15.1)	21.3	(18.3)	16.4	(11.1)
Total	100.0		100.0		100.0		100.0	

Medium and large sites, on average, fed more than six different rations to grower/finisher pigs.

D.7.e. Average number of different rations fed to grower/finisher pigs, by size of site:

Average Number of Rations							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
5.2	(0.3)	6.2	(0.3)	6.0	(0.3)	5.7	(0.2)

Almost half of grower/finisher sites used five to six different rations for pigs, and about one-third of medium and large sites used seven or more rations. More than one-third of small grower/finisher sites used three to four different rations.

D.7.f. Percentage of sites by number of different rations fed to grower/finisher pigs, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Number of different rations	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	7.1	(2.3)	1.1	(0.8)	2.1	(2.0)	3.6	(1.2)
3–4	35.4	(5.4)	13.0	(4.3)	14.3	(6.9)	22.1	(4.7)
5–6	41.2	(5.7)	51.1	(12.4)	51.6	(17.2)	47.2	(8.6)
7 or more	16.4	(4.5)	34.8	(13.1)	32.0	(15.5)	27.1	(8.5)
Total	100.0		100.0		100.0		100.0	

More than 70 percent of grower/finisher sites used at least one meal/mash ration for grower/finishers pigs. While almost half of medium and large grower/finisher sites used at least one pelleted ration, less than 10 percent of small sites did.

D.7.g. Percentage of sites that fed at least one ration of the following type to grower/finisher pigs, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ration	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Meal/mash	88.8	(4.4)	59.1	(13.9)	55.3	(16.1)	70.6	(9.5)
Pellet	8.0	(4.2)	49.4	(11.0)	49.5	(13.9)	32.7	(8.7)
Liquid	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	4.1	(2.0)	0.0	(0.0)	0.0	(0.0)	1.6	(0.8)

Almost 90 percent of small grower/finisher sites fed only meal/mash rations. More than 40 percent of medium and large grower/finisher sites fed only pellet rations.

D.7.h. Percentage of sites by type of ration fed to grower/finisher pigs, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ration	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Meal/mash only	88.0	(4.5)	50.6	(11.0)	50.5	(13.9)	65.6	(8.6)
Pellet only	7.2	(4.1)	40.9	(13.9)	44.2	(16.0)	27.7	(9.6)
Meal and pellets	0.8	(0.7)	8.6	(5.8)	4.3	(3.5)	4.8	(3.3)
Other	4.1	(2.0)	0.0	(0.0)	1.0	(1.1)	1.8	(0.9)
Total	100.0		100.0		100.0		100.0	

More than half of small grower/finisher sites mixed the last grower/finisher ration on-site compared with less than 20 percent of medium and large grower/finisher sites. Over 60 percent of large grower/finisher sites used custom-mixed feed for the last ration.

D.7.i. Percentage of sites by source of last ration fed in the grower/finisher phase, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Mixed by the farm on-site	53.6	(5.3)	19.4	(5.8)	12.4	(5.3)	32.9	(5.6)
Mixed by the farm/ company but off site	13.7	(3.9)	31.8	(12.6)	22.3	(10.9)	22.9	(6.6)
Custom-mixed off farm	23.8	(4.9)	39.6	(13.6)	61.4	(14.2)	35.9	(9.5)
Purchased as a commercial diet	8.2	(3.4)	9.1	(5.0)	3.9	(3.1)	8.1	(3.3)
Other source	0.6	(0.6)	0.0	(0.0)	0.0	(0.0)	0.3	(0.2)
Total	100.0		100.0		100.0		100.0	

On average, a grower/finisher pig ate roughly 575 pounds of feed during the grower/finisher phase.

D.7.j. Average total amount of feed (lb/pig on an as-fed basis) a pig consumed while in the grower/finisher phase, by size of site:

Average Total Feed (lb/pig)							
Size of Site (total inventory)							
Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
564.2	(11.6)	577.2	(11.8)	579.8	(8.8)	576.4	(8.0)

D.7.k. Average total amount of feed (lb/pig on an as-fed basis) a pig consumed while in the grower/finisher phase, by weeks in grower/finisher phase and by size of site:

	Average Total Feed (lb/pig)							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Weeks	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
15 or less	552.2	(24.8)	574.5	(18.5)	563.4	(22.4)	565.7	(13.9)
16–17	601.7	(17.1)	577.1	(18.4)	576.6	(12.0)	579.3	(12.1)
18 or more	598.4	(51.6)	581.2	(12.1)	604.8	(6.6)	580.2	(7.4)
Total	570.4	(12.5)	577.1	(11.5)	581.7	(8.4)	577.9	(7.7)

On average, bulk-feed bins on grower/finisher sites contained 7.5 days of feed when full, which implies that feed delivery trucks came about once a week.

D.7.l. Average number of days until bulk feed bins containing grower/finisher feed would run empty after being filled, by size of site:

Average Number of Days							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
7.2	(0.3)	8.0	(0.4)	7.0	(0.5)	7.5	(0.3)

8. Outshipments

Small grower/finisher sites had shipped pigs to slaughter an average 13.8 times during the previous 6 months, which equates to about 1 shipment every 2 weeks. Large grower/finisher sites shipped 40 loads on average, or almost twice a week.

D.8.a. Average number of pig shipments that left the grower/finisher site during the previous 6 months, by destination and by size of site:

	Average Number of Shipments							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
Slaughter as market hogs	13.8	(1.2)	26.7	(2.8)	39.8	(7.8)	22.8	(1.7)
Slaughter plant as culled pig	1.4	(0.3)	4.3	(1.9)	3.2	(0.9)	2.9	(1.0)
Breeding herd at another site	0.1	(0.0)	4.1	(3.3)	0.3	(0.2)	1.9	(1.6)
Auction/ livestock market	0.4	(0.2)	0.3	(0.2)	0.9	(0.4)	0.4	(0.1)
Other	0.2	(0.1)	0.1	(0.1)	0.1	(0.0)	0.1	(0.0)

D.8.b. Average distance (miles) to the **closest** destination of pig shipments that left the grower/finisher site during the previous 6 months, by destination and by size of site:

	Average Distance (mi)							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
Slaughter as market hogs	86.7	(8.1)	77.1	(11.6)	86.1	(6.6)	82.3	(6.7)
Slaughter plant as culled pig	57.0	(22.4)	40.3	(7.4)	99.2	(57.9)	55.7	(20.3)
Breeding herd at another site	16.8	(8.7)	*		*		31.5	(9.1)
Auction/ livestock market	30.6	(9.2)	19.7	(2.5)	26.8	(4.5)	26.1	(4.5)
Other	21.0	(2.3)	*		*		19.3	(2.3)

*Too few to report

D.8.c. Average distance (miles) to the **farthest** destination for pig shipments that left the grower/finisher site during the previous 6 months, by destination and by size of site:

	Average Distance (mi)							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
Slaughter as market hogs	133.4	(12.4)	143.2	(21.4)	198.1	(40.8)	146.1	(15.2)
Slaughter plant as culled pig	59.9	(22.5)	42.6	(8.0)	100.7	(58.1)	58.0	(20.25)
Breeding herd at another site	34.6	(16.9)	*		*		44.3	(10.0)
Auction/ livestock market	30.8	(9.2)	19.7	(2.5)	26.8	(4.5)	26.2	(4.5)
Other	21.4	(2.2)	*		*		22.6	(2.1)

D.8.d. Percentage of sites that had any shipments of grower/finisher aged pigs during the previous 6 months, by destination and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Slaughter as market hogs	95.4	(1.6)	99.4	(0.5)	97.6	(1.4)	97.4	(0.8)
Slaughter plant as culled pig	31.7	(5.9)	66.8	(10.2)	78.2	(9.5)	53.6	(8.4)
Breeding herd at another site	1.6	(1.0)	4.3	(3.0)	1.7	(1.5)	2.8	(1.5)
Auction/ livestock market	5.7	(2.0)	4.0	(2.9)	10.8	(6.2)	5.6	(2.5)
Other	5.2	(2.3)	1.8	(1.3)	1.1	(0.8)	3.1	(1.3)

D.8.e. For sites that had any shipments of grower/finisher aged pigs during the previous 6 months (table D.8.d), percentage of sites in which at least one shipment left the grower/finisher site and crossed State lines, by destination and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Destination	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Slaughter as market hogs	49.8	(6.3)	55.7	(12.6)	63.3	(10.3)	54.1	(6.8)
Slaughter plant as culled pig	16.3	(7.7)	7.3	(4.0)	15.9	(10.4)	11.2	(4.9)
Breeding herd at another site	0.0	(—)	*		14.5	(16.0)	2.7	(2.6)
Auction/ livestock market	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	0.0	(—)	*		*		*	

E. Wean-to-Finish Phase

1. Disease problems

Overall, the highest percentages of sites with a wean-to-finish phase reported problems with influenza (61.5 percent) and PRRS (39.8 percent).

E.1.a. Percentage of sites in which the following disease problems were present in wean-to-finish pigs during the previous 12 months:

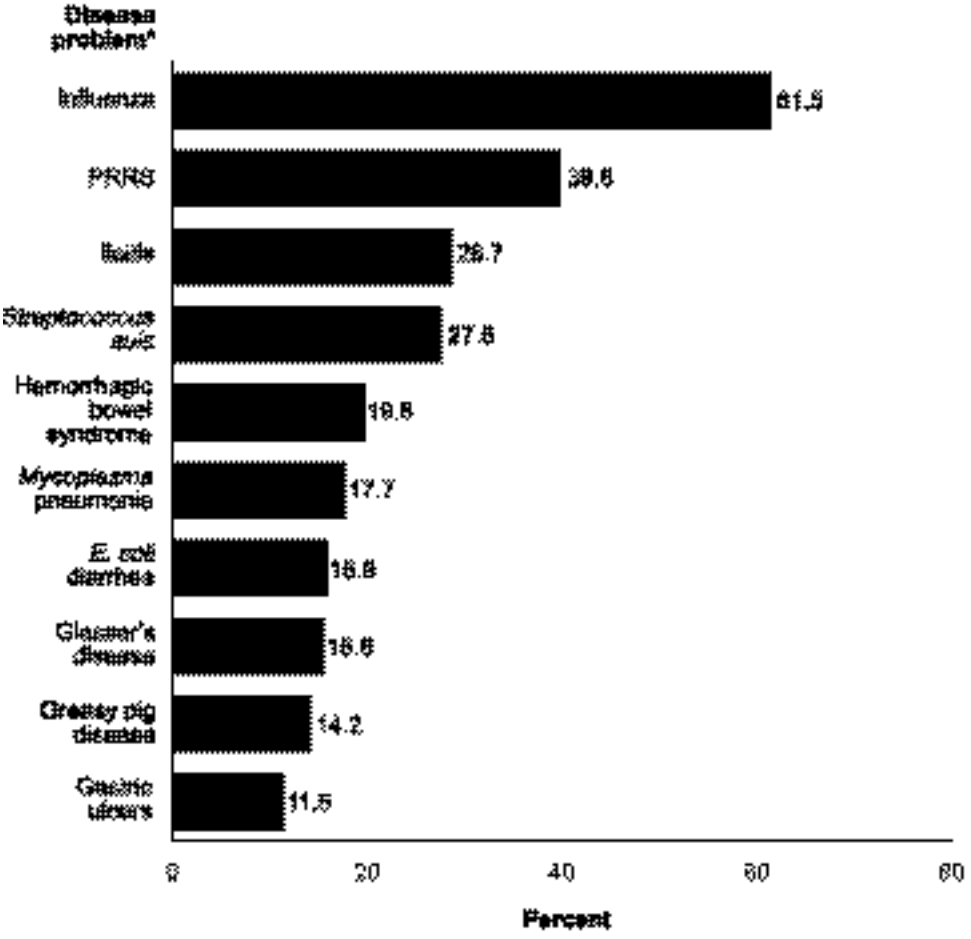
Disease problem*	Percent sites	Std. error
Influenza	61.5	(14.7)
PRRS	39.8	(12.9)
Ileitis	28.7	(11.2)
Streptococcus suis	27.6	(11.7)
Hemorrhagic bowel syndrome	19.8	(8.4)
Mycoplasma pneumonia	17.7	(9.1)
E. coli diarrhea	15.9	(5.1)
Glasser's disease	15.6	(8.5)
Greasy pig disease	14.2	(6.9)
Gastric ulcers	11.5	(5.8)

Table cont'd →

Swine dysentery	9.2	(4.6)
PCVAD	8.6	(6.5)
Other diarrhea	5.5	(3.8)
APP	4.1	(2.3)
Salmonella	3.9	(2.7)
Roundworms	2.3	(1.9)
Atrophic rhinitis	1.7	(1.7)
Lice	1.7	(1.7)
Edema disease	1.0	(1.1)
Erysipelas	0.3	(0.3)
TGE	0.1	(0.0)
Mange	0.0	(—)
PDNS	0.0	(—)
Other	7.4	(5.1)

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

Percentage of sites in which the following disease problems were present in wean-to-finish pigs during the previous 12 months



*This graph reflects producer opinion, which may or may not have been confirmed by a veterinarian or laboratory diagnosis.

Morbidity rate, in this case measured as the percentage of wean-to-finish pigs affected in a group, was above 30 percent for influenza, PRRS, and ileitis. Disease problems with low morbidity (<10 percent) included APP, *Salmonella*, edema disease, atrophic rhinitis, gastric ulcers, erysipelas, PCVAD, roundworms, and lice.

E.1.b. For sites in which the following disease problems were present in wean-to-finish pigs during the previous 12 months, average percentage of wean-to-finish pigs affected in a group, by disease problem:

Disease problem[1]	Average Percent affected	Std. error
Influenza	85.3	(11.4)
PRRS	93.4	(5.9
Ileitis	4.1	(1.7)
Streptococcus suis	23.0	(10.8)
Hemorrhagic bowel syndrome	1.6	(0.4)
Mycoplasma pneumonia	41.8	(8.9)
E. coli diarrhea	47.7	(8.1)
Glasser's disease	43.0	(8.8)
Greasy pig disease	1.7	(0.7)
Gastric ulcers	4.7	(1.2)
Swine dysentery	[2]	
PCVAD	5.1	(1.4)
Other diarrhea	11.1	(6.9)
APP	6.3	(3.2)
Salmonella	19.0	(15.2)
Roundworms	[2]	
Atrophic rhinitis	[2]	
Lice	[2]	
Edema disease	[2]	
Erysipelas	[2]	
TGE	[2]	
Mange	[2]	
PDNS	[2]	
Other	6.0	(3.5)

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

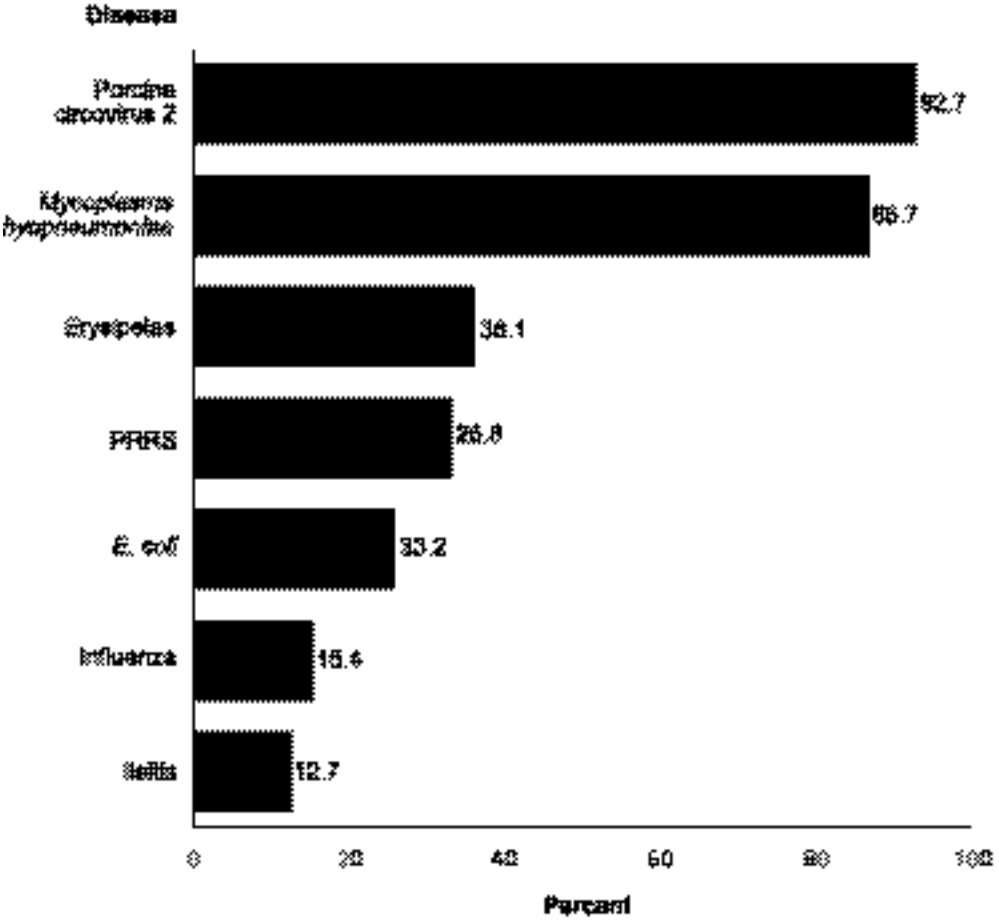
2. Vaccination practices

More than 85 percent of wean-to-finish sites vaccinated pigs for PCV2 and *Mycoplasma hyopneumoniae*. About one-third of wean-to-finish sites vaccinated pigs for erysipelas and *E. coli*.

E.2. Percentage of sites that vaccinated wean-to-finish pigs against the following diseases at any time during the previous 12 months, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Disease	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
APP	6.3	(6.3)	0.0	(0.0)	13.1	(7.5)	4.0	(2.1)
Actinobacillus suis	0.0	(0.0)	2.1	(2.2)	0.0	(0.0)	1.2	(1.2)
Atrophic rhinitis	14.3	(8.9)	0.0	(0.0)	0.0	(0.0)	3.8	(2.5)
C. difficile	0.0	(0.0)	2.1	(2.2)	1.4	(1.6)	1.4	(1.2)
C. perfringens type A	0.0	(0.0)	1.0	(1.1)	0.0	(0.0)	0.6	(0.6)
C. perfringens types C and D	0.0	(0.0)	1.0	(1.1)	0.0	(0.0)	0.6	(0.6)
Erysipelas	10.2	(6.5)	44.8	(24.8)	47.3	(15.7)	36.1	(18.9)
E. coli (K88, K99, 987P, F41)	6.4	(6.5)	45.1	(24.7)	35.7	(19.4)	33.2	(19.4)
Glasser's disease	0.0	(0.0)	0.0	(0.0)	7.5	(6.7)	1.3	(1.1)
Ileitis/proliferative enteritis	0.0	(0.0)	20.2	(11.3)	7.5	(6.7)	12.7	(6.1)
Influenza	4.1	(3.9)	21.8	(18.1)	12.0	(11.9)	15.4	(12.5)
Leptospirosis	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Mycoplasma hyopneumoniae	79.8	(12.9)	95.3	(3.1)	69.6	(10.9)	86.7	(5.0)
Porcine circovirus 2 (PCVAD)	91.9	(5.8)	96.6	(2.7)	81.2	(7.4)	92.7	(2.5)
PRRS	10.4	(7.8)	28.3	(18.5)	41.1	(13.4)	25.8	(12.0)
Rotavirus	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Salmonella	6.4	(6.5)	5.5	(3.9)	0.0	(0.0)	4.7	(3.4)
Streptococcus suis	10.4	(7.8)	2.1	(2.3)	1.4	(1.6)	4.2	(3.3)
TGE	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

Percentage of sites that vaccinated wean-to-finish pigs against the following diseases at any time during the previous 12 months



3.Influenza vaccination

E.3.a. Percentage of wean-to-finish sites that gave pigs second and third doses of influenza vaccine, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Dose	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Second	4.1	(3.9)	0.0	(0.0)	0.0	(0.0)	1.1	(1.0)
Third	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

Only 1.1 percent of wean-to-finish sites administered two doses of influenza vaccine to pigs. On average, pigs were 6.0 weeks of age when receiving the first dose of influenza vaccine.

E.3.b. Site average age of pigs (weeks) when receiving the first, second, and third dose of influenza vaccine:

Dose	**Average age of wean-to-finish pigs** (wk)	**Std. error**
First	6.0	(0.0)
Second	8.0	(0.0)
Third	NA	(—)

On the 15.4 percent of wean-to-finish sites that vaccinated pigs against influenza, almost 100 percent of wean-to-finish pigs received an autogenous influenza vaccine.

E.3.c. For sites that usually vaccinated against influenza during the wean-to-finish phase, percentage of sites by type of influenza vaccine used in wean-to-finish pigs during the previous 12 months and percentage of all wean-to-finish pigs on those sites:

Influenza vaccine type	Percent sites	Std. error	Percent wean-to-finish pigs	Std. error
Commercial influenza vaccine (killed)	7.0	(8.6)	1.1	(1.4)
Autogenous influenza vaccine (killed)	93.0	(8.6)	98.9	(1.4)
Total	100.0		100.0	

4. Response to respiratory disease outbreak

About two-thirds of wean-to-finish sites with a respiratory disease outbreak during the previous 12 months treated the whole room (all pigs in shared airspace with ill pigs); 17.0 percent of did not treat any pigs with antibiotics. No wean-to-finish sites treated pigs at the pen level.

E.4. E.4. Percentage of sites by action that best describes what was done during the most recent respiratory disease outbreak in wean-to-finish pigs during the previous 12 months, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Action	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Had not had clinical respiratory disease in wean-to-finish pigs in last 12 months	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Did not treat any pigs with antibiotics	8.1	(5.8)	22.6	(15.1)	12.3	(12.2)	17.0	(9.3)
Treated only clinically ill pigs with antibiotics	29.2	(12.9)	4.8	(4.1)	18.3	(14.1)	13.6	(6.5)
Treated all pigs in same pen with clinically ill pigs with antibiotics	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Treated all pigs in same pen and pens adjacent to clinically ill pigs with antibiotics	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Treated all pigs in entire room with clinically ill pigs with antibiotics (all pigs with shared airspace)	62.7	(12.3)	72.6	(19.0)	69.4	(19.0)	69.4	(13.2)
Total	100.0		100.0		100.0		100.0	

5. Medications given by injection, in water, and in feed

Over 90 percent of wean-to-finish sites administered injectable antibiotics to one or more pigs during the previous 6 months. Over 50 percent of wean-to-finish sites used injectable antibiotics to treat respiratory disease. Ceftiofur (e.g., Excede) was used by 38.2 percent of sites to treat respiratory disease. One-third of wean-to-finish sites used injectable antibiotics to prevent disease and control disease spread.

E.5.a. For sites with wean-to-finish pigs, percentage of sites that gave the following medications by **injection** to one or more pigs during the previous 6 months, by primary reason given medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Ampicillin	0.0	(—)	0.0	(—)	1.9	(2.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.9	(2.0)
Amoxicillin	0.0	(—)	0.6	(0.6)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.6)
Ceftiofur	0.0	(—)	15.8	(4.8)	38.2	(10.5)	0.5	(0.5)	0.5	(0.5)	0.0	(—)	1.5	(1.4)	56.5	(11.5)
Enrofloxacin	0.0	(—)	10.9	(7.8)	8.5	(3.6)	3.3	(3.0)	4.5	(2.9)	0.0	(—)	0.1	(0.1)	27.3	(12.4)
Erythromycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Florfenicol	0.0	(—)	0.0	(—)	1.9	(1.3)	0.6	(0.7)	0.0	(—)	0.0	(—)	0.0	(—)	2.6	(1.5)
Gentamycin	0.0	(—)	0.0	(—)	0.0	(—)	1.0	(0.8)	0.0	(—)	0.0	(—)	0.0	(—)	1.0	(0.8)
Lincomycin	0.0	(—)	5.4	(4.1)	0.2	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	3.6	(2.9)	9.2	(5.4)
Oxytetracycline	0.0	(—)	0.0	(—)	2.3	(1.8)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(1.2)	3.4	(2.3)
Penicillin benzathine	0.0	(—)	0.0	(—)	4.2	(3.4)	0.0	(—)	0.3	(0.3)	0.0	(—)	0.0	(—)	4.5	(3.5)
Penicillin G potassium	0.0	(—)	7.2	(4.2)	9.8	(5.0)	2.4	(2.5)	2.8	(1.5)	0.0	(—)	2.9	(2.4)	26.3	(9.9)
Tulathromycin	0.0	(—)	0.0	(—)	1.7	(1.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.7	(1.3)
Tylosin	0.0	(—)	4.2	(3.5)	5.5	(3.9)	4.9	(2.9)	0.0	(—)	0.0	(—)	2.2	(1.6)	16.8	(7.1)
Any of the above antimicrobials	0.0	(—)	33.8	(7.6)	51.6	(9.6)	11.1	(5.2)	7.1	(2.4)	0.0	(—)	9.1	(4.2)	90.7	(3.3)

Table cont'd →

E.5.a. (cont'd) For sites with wean-to-finish pigs, percentage of sites that gave the following medications by **injection** to one or more pigs during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Supportive treatment																
Dexamethasone	0.0	(—)	1.3	(1.2)	12.9	(6.7)	0.0	(—)	6.9	(4.5)	0.0	(—)	1.7	(1.4)	22.9	(9.4)
Flunixin meglumine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Isoflupredone	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Vitamin A, D, E	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(1.2)	1.2	(1.2)
Any of the above supportive treatments	0.0	(—)	1.3	(1.2)	12.9	(6.7)	0.0	(—)	6.9	(4.5)	0.0	(—)	1.7	(1.4)	22.9	(9.4)
Other medication	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

Over 85 percent of wean-to-finish sites administered water-soluble antibiotics to pigs for 1 or more days during the previous 6 months. Almost half of wean-to-finish sites used water-soluble antibiotics to treat respiratory disease. The highest percentages of sites used chlortetracycline (24.7 percent) and tiamulin (23.9 percent) to treat respiratory disease. Almost one-third of wean-to-finish sites used water-soluble antibiotics to control and prevent disease. Salicylic acid was used for supportive care on about half the sites.

E.5.b. For sites with wean-to-finish pigs, percentage of sites that gave the following medications in **water** for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Antimicrobial treatment																
Amoxicillin	0.0	(—)	5.8	(3.7)	1.9	(2.0)	0.0	(—)	1.0	(0.7)	0.0	(—)	2.9	(2.6)	11.6	(6.4)
Bacitracin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Chlortetracycline	0.0	(—)	12.9	(6.0)	24.7	(9.5)	0.0	(—)	2.2	(2.3)	0.0	(—)	0.0	(—)	39.8	(14.1)
Chlortetracyline/ sulphamethazine	0.0	(—)	0.0	(—)	7.0	(5.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.0	(5.0)
Florfenicol	0.0	(—)	2.9	(3.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	2.9	(3.0)
Gentamicin	0.0	(—)	4.2	(3.7)	0.0	(—)	20.4	(8.7)	0.0	(—)	0.0	(—)	0.0	(—)	24.5	(11.3)
Lincomycin	0.0	(—)	0.0	(—)	0.2	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(1.2)	1.4	(1.2)
Lincomycin/ spectinomycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Neomycin	0.0	(—)	2.3	(2.3)	0.0	(—)	4.3	(3.3)	0.0	(—)	0.0	(—)	0.0	(—)	6.6	(4.2)
Oxytetracycline	0.0	(—)	0.0	(—)	5.9	(5.8)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	5.9	(5.8)
Penicillin G potassium	0.0	(—)	2.0	(1.4)	0.4	(0.4)	0.0	(—)	1.8	(1.3)	0.0	(—)	0.0	(—)	4.2	(2.0)
Spectinomycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Sulfachlorpyridazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Sulfadimethoxine	0.0	(—)	0.0	(—)	4.0	(2.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	4.0	(2.4)
Sulfamethazine	0.0	(—)	0.0	(—)	0.4	(0.4)	0.6	(0.7)	0.0	(—)	0.0	(—)	0.0	(—)	1.1	(0.8)
Tetracycline	0.0	(—)	0.0	(—)	0.4	(0.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.4	(0.4)
Tiamulin	0.0	(—)	9.4	(6.1)	23.9	(15.6)	1.3	(1.2)	0.0	(—)	0.0	(—)	1.2	(1.2)	35.8	(20.7)
Trimethoprim/ sulfadiazine	0.0	(—)	6.3	(4.6)	5.1	(4.5)	0.5	(0.5)	0.5	(0.5)	0.0	(—)	0.0	(—)	12.4	(6.7)
Tylosin	0.0	(—)	2.6	(2.6)	1.0	(1.1)	0.2	(0.3)	0.0	(—)	0.0	(—)	0.0	(—)	3.9	(3.0)
Virginiamycin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above antimicrobials	0.0	(—)	30.5	(5.6)	47.5	(10.1)	21.8	(8.9)	5.0	(2.8)	0.0	(—)	4.1	(3.0)	86.3	(5.9)

Table cont'd →

E.5.b. (cont'd) For sites with wean-to-finish pigs, percentage of sites that gave the following medications in **water** for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respira-tory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**	**Pct.**	**Std. err.**
Parasite treatment																
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Piperazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.6)	0.0	(—)	0.6	(0.6)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.6)	0.0	(—)	0.6	(0.6)
Supportive treatment																
Salicylic acid	0.0	(—)	0.0	(—)	33.7	(19.4)	0.0	(—)	0.0	(—)	0.0	(—)	16.6	(12.4)	50.3	(15.8)
Vitamin D	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(1.2)	1.2	(1.2)
Vitamin E	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other medication	0.0	(—)	0.6	(0.6)	0.6	(0.6)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	1.2	(0.9)

*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

Chlortetracycline and tiamulin were administered in water to wean-to-finish pigs for an average of 6 to 7 days.

E.5.c. For sites that gave wean-to-finish pigs the following medications in **water** during the previous 6 months, site average of number of days water was given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Amoxicillin	4.8	(0.6)
Chlortetracycline	6.4	(0.5)
Gentamicin	3.3	(0.3)
Neomycin	9.3	(2.2)
Tiamulin	6.9	(0.1)
Trimethoprim/sulfadiazine	5.5	(0.4)
Parasite treatment		
Piperazine	5.0	(0.0)
Supportive treatment		
Salicylic acid	8.0	(1.4)
Vitamin D	7.0	(0.0)
Other medication	12.3	(6.0)

*Estimates not reported for some medications listed in table E.5.b due to small sample size.

E.5.d. For sites that gave wean-to-finish pigs any antimicrobials in **water** during the previous 6 months, site average of number of days given, by primary reason given:

Average Number of Days															
Primary Reason Given															
Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
NA		9.5	(1.7)	10.4	(2.1)	5.8	(2.0)	7.6	(1.3)	NA		*	

*Too few to report.

Almost all wean-to-finish sites had administered feed antibiotics to pigs for 1 or more days during the previous 6 months. Over 80 percent of wean-to-finish sites used feed antibiotics to prevent disease and control disease spread. Chlortetracycline and carbadox were used for disease control and prevention by the highest percentages of sites. About 40 percent of wean-to-finish sites used antibiotics in feed for growth promotion. Virginiamycin was used in feed by 32.3 percent of wean-to-finish sites for growth promotion. Just over one-fifth of wean-to-finish sites used ractopamine. No sites administered parasite treatment in the feed of wean-to-finish pigs.

E.5.e. For sites with wean-to-finish pigs, percentage of sites that gave the following medications in feed for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.
Antimicrobial treatment																
Bacitracin methylene disalicylate	7.6	(4.4)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	7.6	(4.4)
Bacitracin zinc	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Bambermycins	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Carbadox	0.0	(—)	35.1	(19.1)	0.0	(—)	4.4	(2.7)	0.0	(—)	0.0	(—)	0.3	(0.3)	39.7	(18.3)
Carbadox/ oxytetracycline	0.0	(—)	19.4	(8.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	19.4	(8.2)
Chlortetracycline	1.7	(1.4)	49.5	(7.7)	13.5	(6.5)	1.9	(2.0)	0.0	(—)	0.0	(—)	0.0	(—)	66.7	(8.7)
Chlortetracycline/ sulfathiazole/ penicillin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Chlortetracycline/ sulfamethazine/ penicillin	0.0	(—)	3.9	(3.0)	0.1	(0.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	3.9	(3.0)
Florfenicol	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Lincomycin	0.1	(0.1)	12.2	(5.2)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	12.3	(5.3)
Neomycin/ terramycin	0.0	(—)	0.0	(—)	0.0	(—)	2.9	(3.0)	0.0	(—)	0.0	(—)	0.0	(—)	2.9	(3.0)
Oxytetracycline	0.0	(—)	0.6	(0.6)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.6	(0.6)
Tiamulin	0.0	(—)	23.3	(7.0)	3.5	(2.8)	18.5	(12.3)	0.0	(—)	0.0	(—)	0.0	(—)	45.3	(10.4)
Tilmicosin	0.0	(—)	4.2	(3.0)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	4.2	(3.0)
Tylosin	0.3	(0.3)	13.5	(7.9)	0.0	(—)	6.9	(3.9)	0.0	(—)	0.0	(—)	0.0	(—)	20.7	(9.8)
Tylosin/ sulfamethazine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Tylosin/ ractopamine	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Virginiamycin	32.3	(19.5)	2.4	(1.7)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	34.7	(21.1)
Any of the above antimicrobials	39.9	(18.1)	83.4	(7.0)	13.6	(6.5)	26.9	(13.3)	0.0	(—)	0.0	(—)	0.3	(0.3)	97.9	(1.6)

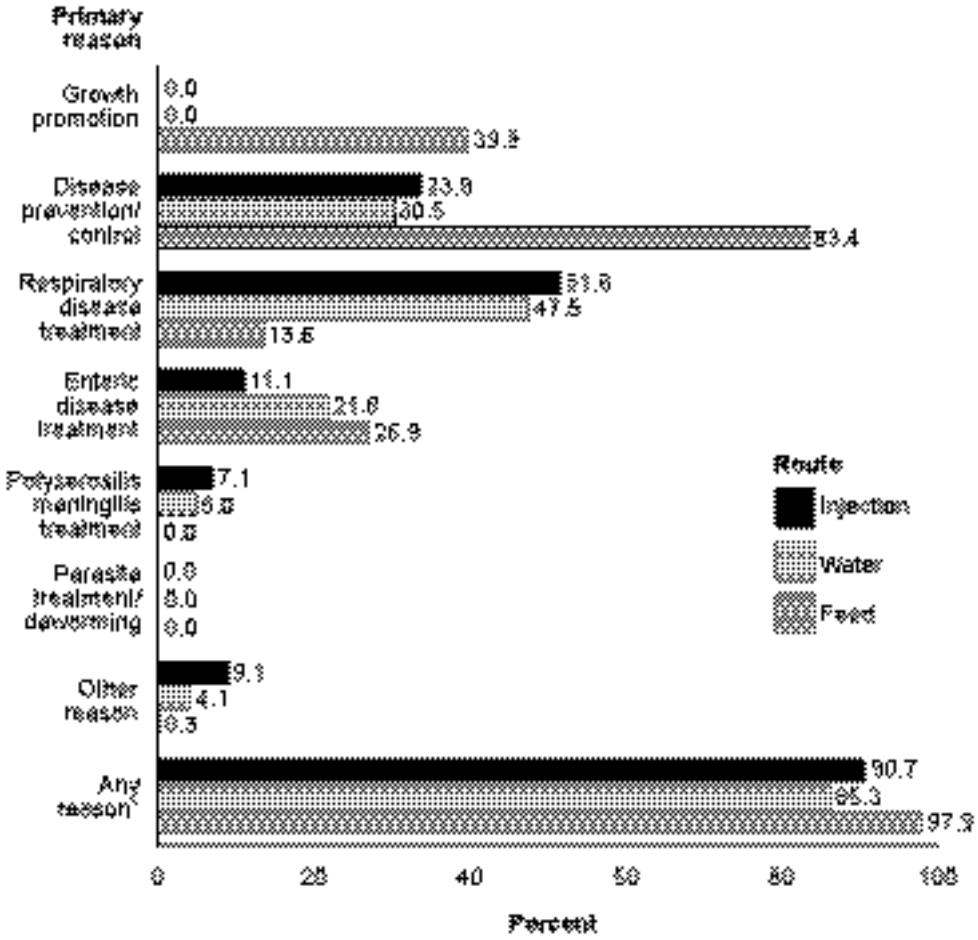
Table cont'd →

E.5.e. (cont'd) For sites with wean-to-finish pigs, percentage of sites that gave the following medications in feed for 1 or more days during the previous 6 months, by primary reason medication was given:

	Percent Sites															
	Primary Reason Given															
	Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason		Any reason*	
Medication	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.	Pct.	Std. err.
Parasite treatment																
Dichlorvos	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Doramectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Fenbendazole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Ivermectin	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Levamisole	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Pyrantel tartrate	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Any of the above parasite treatments	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Supportive treatment																
Ractopamine	19.0	(9.4)	2.3	(2.3)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	21.3	(10.1)
Zinc oxide	0.0	(—)	0.0	(—)	0.0	(—)	1.9	(2.0)	0.0	(—)	0.0	(—)	0.0	(—)	1.9	(2.0)
Any of the above supportive treatments	19.0	(9.4)	2.3	(2.3)	0.0	(—)	1.9	(2.0)	0.0	(—)	0.0	(—)	0.0	(—)	23.2	(10.6)
Other medication	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

*Total may not sum to "Any Reason" estimate due to rounding of specific treatments by reason.

For sites with wean-to-finish pigs, percentage of sites that gave any antimicrobial to wean-to-finish pigs during the previous 6 months, by primary reason antimicrobial was given and by route given



*Total may not sum to "Any reason" estimate due to rounding of specific treatments by reason.

Chlortetracycline and carbadox were used in the feed of wean-to-finish pigs for disease prevention for an average of 17.7 and 14.3 days, respectively. Virginiamycin was in wean-to-finish feed for growth promotion for an average of 21.2 days.

E.5.f. For sites that gave wean-to-finish pigs the following medications in **feed** during the previous 6 months, site average of number of days medication given:

Medication*	Average number of days	Std. error
Antimicrobial treatment		
Bacitracin methylene disalicylate	70.1	(11.5)
Carbadox	14.3	(1.3)
Carbadox/oxytetracycline	10.8	(1.2)
Chlortetracycline	17.7	(3.8)
Lincomycin	27.4	(8.7)
Tiamulin	21.7	(5.3)
Tylosin	22.5	(7.5)
Virginiamycin	21.2	(6.3)
Other treatment		
Ractopamine	21.6	(1.5)
Zinc oxide	35.0	(0.0)

*Estimates not reported for other medications in table E.5.e due to small sample size or no sites gave the medication.

E.5.g. For sites that gave wean-to-finish pigs any antimicrobial in **feed** during the previous 6 months, site average number of days antimicrobials were given, by primary reason given:

Site Average Number of Days													
Primary Reason Given													
Growth promotion		Disease prevention/ control		Respiratory disease treatment		Enteric disease treatment		Polysero-sitis meningitis treatment		Parasite treatment/ deworming		Other reason	
Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.	Avg.	Std. err.
33.0	(14.6)	32.2	(4.4)	23.7	(3.7)	30.5	(4.0)	NA		NA		*	

*Too few to report.

6. Feed management

Over 80 percent of medium and 100 percent of large wean-to-finish sites included DDGS in at least one diet fed to pigs before the split. Less than 30 percent of small wean-to-finish sites did so. Almost 90 percent of wean-to-finish sites included DDGS in at least one diet fed to pigs after the split, if there was one. More than one-third of wean-to-finish sites included spray dried plasma in at least one diet fed to pigs after the split, if there was one.

E.6.a. Percentage of sites that used the following ingredients in any wean-to-finish diet before the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ingredient	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Tallow	0.0	(0.0)	57.5	(21.3)	34.4	(22.7)	38.0	(21.6)
Lard or choice	33.1	(21.6)	70.8	(15.1)	59.3	(23.1)	58.8	(15.7)
Other animal fat	6.0	(6.2)	0.0	(0.0)	24.5	(21.4)	6.4	(5.6)
Soybean oil	16.7	(15.9)	5.6	(6.4)	13.0	(12.3)	9.9	(8.0)
Corn oil	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other vegetable fat	0.0	(0.0)	68.0	(15.7)	50.8	(23.3)	46.9	(18.8)
Molasses	16.7	(15.9)	5.6	(6.4)	8.1	(8.1)	9.0	(7.7)
Spray dried plasma	39.1	(22.9)	7.8	(7.4)	35.9	(22.4)	21.5	(12.2)
Blood meal, serum albumin, or other blood products	22.7	(17.4)	5.6	(6.4)	33.0	(22.4)	15.5	(10.2)
Mucosal products such as dried porcine soluble, PEP products	0.0	(0.0)	0.0	(0.0)	8.1	(8.1)	1.6	(1.7)
Fish meal	16.7	(15.9)	65.3	(17.6)	83.8	(13.1)	56.3	(15.9)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	0.0	(0.0)	2.2	(2.5)	0.0	(0.0)	1.2	(1.2)
Soybean meal or vegetable protein source	100.0	(0.0)	81.3	(9.8)	100.0	(0.0)	89.9	(5.4)
Other protein sources	0.0	(0.0)	16.2	(14.2)	24.5	(21.4)	13.6	(9.2)
Bakery/food manufacture byproducts	10.6	(10.2)	0.0	(0.0)	0.0	(0.0)	2.7	(2.7)
Distiller's dried grain and solubles (DDGS)	28.4	(18.9)	81.3	(9.8)	100.0	(0.0)	71.2	(12.4)

E.6.b. Percentage of sites that used the following ingredients in any wean-to-finish diet after the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Ingredient	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Tallow	0.0	(0.0)	24.9	(20.7)	17.8	(15.2)	17.0	(14.3)
Lard or choice white grease	16.3	(12.5)	85.5	(8.7)	74.0	(18.7)	64.9	(14.6)
Other animal fat	14.4	(11.7)	1.9	(2.0)	0.0	(0.0)	5.0	(3.7)
Soybean oil	0.0	(0.0)	0.0	(0.0)	7.5	(7.5)	1.2	(1.1)
Corn oil	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other vegetable fat	12.0	(11.2)	4.0	(4.2)	0.0	(0.0)	5.5	(4.2)
Molasses	0.0	(0.0)	0.0	(0.0)	0.8	(0.9)	0.1	(0.1)
Spray dried plasma	12.4	(11.8)	47.4	(24.2)	33.3	(11.0)	35.7	(17.3)
Blood meal, serum albumin, or other blood products	12.4	(11.8)	12.8	(8.6)	0.4	(0.3)	10.7	(7.2)
Mucosal products such as dried porcine soluble, PEP products	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Fish meal	12.4	(11.8)	49.8	(23.9)	25.4	(12.8)	35.8	(17.4)
Feather meal	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Meat meal or meat and bone meal	0.0	(0.0)	0.0	(0.0)	0.4	(0.3)	0.1	(0.0)
Soybean meal or other vegetable protein source	93.8	(4.7)	100.0	(0.0)	87.6	(13.0)	96.4	(2.6)
Other protein sources	3.9	(3.9)	0.0	(0.0)	22.0	(7.8)	4.5	(2.0)
Bakery/food manufacture byproducts	2.3	(2.4)	27.9	(20.8)	35.2	(12.3)	22.1	(13.5)
Distiller's dried grain and solubles (DDGS)	73.5	(14.6)	95.4	(4.3)	81.0	(15.7)	87.2	(6.5)

Overall, DDGS made up 9.1 percent of wean-to-finish diets fed to pigs before the split and 20.6 percent of diets fed after the split, if there was one.

E.6.c. For sites that used DDGS in any wean-to-finish diet before the split, average percentage of DDGS in feed, by size of site:

Average Percent							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
6.1	(1.2)	5.6	(0.7)	12.9	(2.7)	9.1	(2.7)

E.6.d. For sites that used DDGS in wean-to-finish diets after the split, average percentage of DDGS in feed, by size of site:

Average Percent							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
15.7	(4.9)	21.7	(3.0)	20.1	(1.8)	20.6	(2.4)

Over 90 percent of small and medium wean-to-finish sites included DDGS in any diet fed to weaned-to-finish pigs before the split at a concentration of 1 to 10 percent, compared with 37.6 percent of large sites. Over 60 percent of large wean-to-finish sites included DDGS in feed at an 11- to 20-percent concentration level before the split. More than half of wean-to-finish sites included DDGS at a concentration of 11 to 20 percent of diets fed after the split, if there was one.

E.6.e. For sites that used DDGS in any wean-to-finish diet before the split, percentage of sites by percentage of DDGS in feed, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Percent DDGS	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–10	100.0	(0.0)	93.2	(7.7)	37.6	(22.9)	78.0	(15.0)
11–20	0.0	(0.0)	6.8	(7.7)	62.4	(22.9)	22.0	(15.0)
21–30	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
More than 30	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

E.6.f. For sites that used DDGS in any wean-to-finish diet after the split, percentage of sites by percentage of DDGS in feed, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Percent DDGS	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
1–10	52.1	(25.3)	12.3	(9.0)	14.8	(13.1)	22.1	(13.0)
11–20	28.5	(19.1)	56.9	(24.7)	68.8	(24.6)	52.0	(21.4)
21–30	16.3	(15.5)	30.8	(23.1)	16.4	(17.4)	25.2	(17.3)
More than 30	3.1	(3.3)	0.0	(0.0)	0.0	(0.0)	0.7	(0.8)
Total	100.0		100.0		100.0		100.0	

Overall, an average of 4.7 different rations were fed to wean-to-finish pigs before the split and an average of 7.9 different rations were fed after the split, if there was one.

E.6.g. Average number of different rations fed to wean-to-finish pigs before the split, by size of site:

Average Number of Rations							
Size of Site (total inventory)							
Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Avg.	Std. error	Avg.	Std. error	Avg	Std. error	Avg	Std. error
4.0	(0.3)	3.4	(0.3)	6.3	(1.8)	4.7	(1.1)

E.6.h. Average number of different rations fed to wean-to-finish pigs after the split, by size of site:

Average Number of Rations							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg**	**Std. error**	**Avg**	**Std. error**
6.6	(0.7)	8.3	(0.7)	7.7	(0.7)	7.9	(0.5)

Almost 70 percent of wean-to-finish sites used three to four different rations before the split. More than 80 percent of medium and large wean-to-finish sites used seven or more different rations after the split, if there was one.

E.6.i. Percentage of sites by number of different rations fed to wean-to-finish pigs before the split, and by size of site:

Percent Sites								
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Number of different rations	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**ct.**	**Std. error**
1–2	16.5	(15.5)	0.0	(0.0)	0.0	(0.0)	4.5	(4.5)
3–4	61.2	(22.1)	86.0	(13.1)	37.6	(22.9)	69.3	(14.9)
5–6	22.3	(14.7)	14.0	(13.1)	24.5	(21.4)	18.4	(10.4)
7 or more	0.0	(0.0)	0.0	(0.0)	37.9	(23.1)	7.8	(6.4)
Total	100.0		100.0		100.0		100.0	

E.6.j. Percentage of sites by number of different rations fed to wean-to-finish pigs after the split, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Number of different rations	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
1–2	0.0	(0.0)	0.5	(0.5)	0.0	(0.0)	0.3	(0.3)
3–4	14.6	(9.9)	2.9	(2.6)	0.0	(0.0)	5.3	(3.7)
5–6	52.0	(12.3)	4.7	(4.4)	19.1	(7.2)	18.6	(7.0)
7 or more	33.4	(13.5)	91.9	(5.7)	80.9	(7.2)	75.7	(8.6)
Total	100.0		100.0		100.0		100.0	

All wean-to-finish sites used at least one meal/mash ration before the split, and more than 80 percent used a pelleted ration in the same period. Less than 40 percent of large wean-to-finish sites used a meal/mash ration after the split. More than half of wean-to-finish sites used at least one pelleted ration after the split.

E.6.k. Percentage of sites that fed at least one ration of the following type to the wean-to-finish pigs before the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Ration	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Meal/mash	100.0	(0.0)	100.0	(0.0)	100.0	(0.0)	100.0	(0.0)
Pellet	60.9	(22.9)	91.5	(7.9)	88.6	(9.3)	82.6	(10.2)
Liquid	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)

E.6.l. Percentage of sites that fed at least one ration of the following types to the wean-to-finish pigs after the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Ration	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Meal/mash	79.6	(13.4)	91.6	(5.6)	37.2	(23.5)	79.9	(8.9)
Pellet	60.2	(20.3)	50.6	(17.6)	63.6	(23.2)	55.0	(14.8)
Liquid	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Other	0.0	(0.0)	0.0	(0.0)	6.7	(7.2)	1.1	(1.1)

Over 80 percent of wean-to-finish sites fed meal and pellet rations before the split. More than 55 percent of large wean-to-finish sites fed pellet-only rations after the split (if there was one) and no sites fed only pelleted rations before the split. About 40 percent of small and medium wean-to-finish sites fed meal and pellets after the split, if there was one.

E.6.m. Percentage of sites that fed different rations of the following type to wean-to-finish pigs before the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Ration	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Meal/mash only	39.1	(22.9)	8.5	(7.9)	11.4	(9.3)	17.4	(10.2)
Pellet only	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Meal and pellets	60.9	(22.9)	91.5	(7.9)	88.6	(9.3)	82.6	(10.2)
Other	0.0	(—)	0.0	(—)	0.0	(—)	0.0	(—)
Total	100.0		100.0		100.0		100.0	

E.6.n. Percentage of sites that fed different rations of the following type to wean-to-finish pigs after the split, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Ration	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Meal/mash only	39.8	(20.3)	49.4	(17.6)	36.4	(23.2)	45.0	(14.8)
Pellet only	20.4	(13.4)	8.4	(5.6)	56.1	(26.3)	19.0	(9.1)
Meal and pellets	39.8	(13.3)	42.3	(13.5)	0.8	(0.9)	34.9	(8.6)
Other	0.0	(0.0)	0.0	(0.0)	6.7	(7.2)	1.1	(1.1)
Total	100.0		100.0		100.0		100.0	

On average, a wean-to-finish pig ate roughly 615 pounds of feed during the wean-to-finish phase.

E.6.o. Average total amount of feed (lb/pig on an as-fed basis) a pig consumed while in the wean-to-finish phase after the split, if there was one, by size of site:

Average Total Feed (lb/pig)							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
631.9	(19.5)	600.6	(28.6)	631.3	(10.8)	614.9	(17.9)

On average, bulk feed bins on wean-to-finish sites contained 8 to 9 days of feed when full, which implies that feed delivery trucks came about once a week.

E.6.p. Average number of days until bulk feed bins containing wean-to-finish feed would run empty after being filled before the split, by size of site:

Average Number of Days							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
9.3	(0.5)	10.8	(2.6)	7.2	(0.9)	9.1	(1.1)

E.6.q. Average number of days until bulk feed bins containing wean-to-finish feed would run empty after being filled after the split, by size of site:

Average Number of Days							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Avg.	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**	**Avg.**	**Std. error**
8.3	(1.0)	9.1	(2.0)	6.6	(1.5)	8.1	(1.8)

7. Outshipments

E.7. Average number of pig shipments that left the wean-to-finish phase during the previous 6 months, by destination and by size of site:

	Average Number Pigs							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		Medium (2,000–4,999)		Large (5,000 or more)		All sites	
Destination	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Another grower/ finisher site	1.2	(0.8)	2.2	(1.3)	11.2	(4.1)	3.3	(1.1)
Slaughter as market hogs	10.4	(2.1)	14.3	(1.4)	26.6	(2.5)	15.4	(1.4)
Slaughter plant as culled pig	1.6	(1.4)	0.8	(0.1)	2.5	(1.4)	1.3	(0.5)
Breeding herd at another site	0.0	(0.0)	0.0	(0.0)	2.9	(2.6)	0.5	(0.4)
Auction/livestock market	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Other	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)

F. Feed Management and Other Site-level Practices

1. Source of nutritional expertise

About half of sites, regardless of size, rated a veterinarian as a very or extremely important source of nutritional expertise. A higher percentage of large sites than small sites rated company/staff nutritionist very or extremely important as a source of nutritional expertise. Conversely, a higher percentage of small sites than large sites rated a genetic supplier very or extremely important as a source of nutritional expertise.

F.1.a. Percentage of sites that rated the following sources of swine nutritional expertise as very or extremely important, by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Information source	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Company/staff nutritionist	48.4	(5.5)	73.5	(7.5)	85.3	(5.1)	65.1	(6.3)
Feed company	62.0	(5.1)	54.5	(11.9)	44.1	(13.3)	55.8	(8.1)
Consulting nutritionist	47.5	(5.5)	47.6	(12.3)	44.8	(13.9)	47.1	(8.2)
Veterinarian	54.8	(5.5)	41.1	(11.7)	59.1	(12.0)	49.6	(7.0)
Genetic supplier	25.0	(4.3)	15.4	(4.4)	7.5	(2.9)	18.0	(3.5)
Other producers	9.7	(2.7)	2.9	(1.2)	3.4	(1.7)	5.7	(1.5)
Trade journals/ Internet	12.8	(4.0)	1.4	(0.7)	4.5	(2.5)	6.5	(2.0)
Other sources	1.9	(1.0)	1.4	(0.8)	0.4	(0.3)	1.5	(0.6)

F.1.b. Percentage of sites that rated the following sources of swine nutritional expertise as very or extremely important, by region:

	Percent Sites					
	Region					
	Midwest		East		South	
Information source	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Company/staff nutritionist	58.0	(8.5)	58.2	(12.8)	92.5	(4.9)
Feed company	75.1	(6.2)	52.6	(13.8)	8.1	(4.6)
Consulting nutritionist	53.5	(9.7)	68.2	(10.6)	4.8	(3.4)
Veterinarian	65.0	(7.8)	39.5	(11.8)	21.4	(4.5)
Genetic supplier	26.8	(5.8)	12.2	(4.3)	2.2	(2.2)
Other producers	6.5	(2.1)	6.3	(2.9)	2.8	(2.1)
Trade journals/ Internet	5.3	(1.7)	12.3	(6.1)	1.8	(1.6)
Other sources	1.9	(0.9)	1.4	(1.0)	0.3	(0.3)

2. Diet manipulations

Over one-fourth of sites were currently using mycotoxin binders, and almost half of sites had tried them but were not currently using them. One-third of small sites had never used mycotoxin binders.

F.2.a. Percentage of sites by use of mycotoxin binders, and by size of site:

	Percent Sites							
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Use of binders	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Currently using	25.5	(4.7)	21.0	(7.0)	36.5	(11.5)	25.4	(5.9)
Tried but not currently using	27.4	(5.3)	63.5	(8.8)	54.9	(12.2)	47.5	(7.6)
Never used	33.2	(4.7)	11.8	(3.6)	6.3	(2.6)	19.5	(3.7)
Don’t know	13.9	(4.2)	3.7	(1.7)	2.3	(1.6)	7.6	(2.2)
Total	100.0		100.0		100.0		100.0	

Over three-fourths of all sites were using DDGS, although over one-fourth of small sites had never used DDGS.

F.2.b. Percentage of sites by use of DDGS, and by size of site:

Percent Sites								
	Size of Site (total inventory)							
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Use of DDGS	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
Currently using	61.4	(4.8)	89.3	(3.0)	83.2	(7.1)	77.1	(4.0)
Tried but not currently using	10.5	(2.4)	7.7	(2.6)	11.1	(5.9)	9.4	(2.4)
Never used	26.7	(4.3)	3.0	(1.3)	5.7	(3.1)	13.0	(2.7)
Don't know	1.3	(0.6)	0.0	(0.0)	0.0	(0.0)	0.5	(0.2)
Total	100.0		100.0		100.0		100.0	

3. Split-sex feeding

Split-sex feeding is the practice of separating market pigs by sex and feeding them different diets. About 15 percent of sites used split-sex feeding. On average, split-sex feeding began when pigs were about 8 weeks of age.

F.3.a. Percentage of sites that fed different rations to weaned male and female market pigs, by size of site:

Percent Sites								
	Size of Site (total inventory)							
Small (fewer than 2,000)			**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Pct.	**Std. error**		**Pct.**	**Std. error**	**Pct.**	**Std. error**	**Pct.**	**Std. error**
14.6	(3.6)		15.8	(5.2)	14.9	(6.6)	15.2	(3.7)

F.3.b. Percentage of sites that fed different rations to weaned male and female market pigs, by region:

Percent Sites					
Region					
Midwest		East		South	
Percent	Std. error	Percent	Std. error	Percent	Std. error
15.2	(4.1)	20.6	(8.6)	7.5	(7.6)

F.3.c. For sites that used split-sex feeding, average age (in weeks) of pigs when split-sex feeding was started, by size of site:

Average Age (wk)							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
7.7	(1.0)	7.8	(0.8)	8.5	(0.6)	7.9	(0.7)

4. Transport and hauling

F.4.a. Percentage of sites that shipped swine from the site, by truck ownership and by size of site:

Percent Sites								
Size of Site (total inventory)								
	Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Truck ownership	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
This operation	59.1	(5.5)	73.5	(8.4)	76.8	(11.4)	68.3	(6.7)
Commercial hauler	62.8	(4.9)	78.2	(4.6)	61.3	(12.5)	69.2	(4.5)

A higher percentage of sites in the South region than in the Midwest region shipped swine using their own trucks.

F.4.b. Percentage of sites that shipped swine from this site using trucks owned and operated by the operation, by region:

Percent Sites					
Region					
Midwest		East		South	
Percent	Std. error	Percent	Std. error	Percent	Std. error
67.1	(7.3)	50.0	(13.7)	95.7	(2.8)

F.3.c. For sites that shipped swine using commercial trucks hired by the operation, percentage of sites that used only commercial truckers that were Transport Quality Assurance certified, by size of site:

Percent Sites							
Size of Site (total inventory)							
Small (fewer than 2,000)		**Medium** (2,000–4,999)		**Large** (5,000 or more)		**All sites**	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
92.9	(2.6)	86.7	(11.8)	85.5	(13.2)	88.8	(7.8)

Section II: Methodology

A. Needs Assessment and Study Objectives

NAHMS develops study objectives by exploring existing literature and contacting stakeholders about their informational needs and priorities during a needs assessment phase. Stakeholders for NAHMS studies include industry members, allied industry representatives, government agencies, animal health officials, and many others. The purpose of the needs assessment was to collect information about the most important swine health and production management issues facing the U.S. swine industry. A driving force for the needs assessment was for NAHMS to receive input from a variety of producers, as well as from industry experts and representatives; Federal, State, and private veterinarians; extension specialists; universities; and swine organizations. Information was collected via interviews and through a needs assessment survey.

Once the most important issues were identified, the study objectives were created by prioritizing the needs garnered throughout the needs assessment phase.

The study objectives for the NAHMS Swine 2012 study follow:

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, grower/finisher, and wean-to-finish.

2. Describe trends in swine health and management practices.

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

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

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

6. Update estimates of the economic costs of select respiratory, neurologic, gastrointestinal, systemic, and foodborne pathogens found in commercial swine herds and create estimates of the costs of different treatment approaches.

B. Sampling and Estimation

1. State selection

The preliminary selection of States to be included in the study was done using the NASS 2007 Census of Agriculture and the December 1, 2010, quarterly “Hogs and Pigs” report. A goal for NAHMS national studies is to include States that account for at least 70 percent of the animal and producer populations in the United States. Factors that influenced State selection were a high proportion of U.S. farms or animals, demographic trends, and regional representation. The 13 States recommended for inclusion in the study were Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Carolina, Ohio, Oklahoma, Pennsylvania, South Dakota, and Texas. The selection criteria for operations in these States were 100 or more pigs.

2. Operation selection

The sample design was a multistage design in which the operation was the primary sampling unit and the site was the analysis unit. (See Terms Used in this Report for a definition of operation and site.)

The list frame used for sampling operations was provided by NASS. Within each State, a stratified random sample was selected in which the size stratum was based on operation inventory on the NASS list frame. Size strata were 100 to 999 head, 1,000 to 1,999 head, 2,000 to 4,999 head, and 5,000 or more head in total inventory. The sample of 4,600 operations was drawn in 5 replicates to facilitate mixed- mode data collection, with 2,000 operations receiving a computer-assisted telephone interview (CATI) and 2,600 operations getting an on-farm personal interview. The CATI sample was chosen from operations with fewer than 1,000 pigs (according to the list frame) to minimize the number of operations with multiple sites in the CATI sample.

The State-level allocation was based on a weighted percentage of the number of operations in the State and the pig inventory relative to the U.S. levels for swine farms with 100 or more pigs. The percentage of the 13-State total for the population of 100-plus swine farms in the State was given a 0.4 weighting and the percentage of pigs was given a 0.6 weighting. For example, Iowa has 31.6 percent of pigs and 34.2 percent of the the farms in the United States. Iowa was initially assigned 32.6 percent (31.6*0.6+34.2*0.4=32.6) of the sample of 4,600 operations drawn in replicates. The allocation was adjusted to move some of the sample from States with a large number of operations to other States with fewer operations. Within States, the number of operations was allocated to each size stratum using the same strategy as for the State-level allocation.

3. Site selection

Some producers on the NASS list frame represented swine operations in which pigs were raised on multiple sites. A subsample of sites was selected for operations with multiple sites in a State. The number of sites selected depended on the size of the operation. If the operation had fewer than 20 sites, 1 sow site and 2 nonsow sites were randomly selected. If the operation had 20 to 49 sites, 2 sow sites and 6 nonsow sites were randomly selected. If the operation had 50 or more sites, 3 sow sites and 12 nonsow sites were randomly selected.

4. Population inferences

Data collected from sampled producers were used to generate national estimates. All respondent data were statistically weighted to reflect the population from which they were selected. The inverse of the probability of selection for each operation was the initial selection weight. This selection weight was adjusted for nonresponse within each State and size group. Site-level weights were then calculated for sow sites and nonsow sites, so that sow sites only represented other sites with sows, and non-sow sites only represented other sites without sows. The site-level weights were also adjusted for nonresponse.

Inferences are to the population of swine operations with 100 or more pigs in the 13 participating States. According to the 2007 Census of Agriculture, these States accounted for 88.9 percent of U.S. swine operations with 100 or more swine, and 90.8 percent of swine on operations with 100 or more swine.

C. Data Collection

Two methods were used to collect data for the Swine 2012 study. For the 2,600 producers selected to complete the survey via face-to-face interview, producers were contacted by a NASS enumerator to set up a convenient time for an on-farm visit. The NASS enumerator administered the general swine farm questionnaire (GSFQ) via face-to-face interviews conducted from July 16 through August 15, 2012. For the 2,000 producers selected to complete the survey via CATI, a shorter version of the GSFQ was completed during the same time period.

Upon completion of the interviews (CATI and on-farm), respondents with 100 or more pigs were asked to sign a consent form allowing NASS to turn their names over to APHIS for further consideration in the study, which completed phase I of the study. NASS provided the list of producers willing to participate in the study's second phase to NAHMS coordinators in each State. NASS sent a dataset to NAHMS along with completed questionnaires via mail.

State and Federal veterinary medical officers (VMOs) contacted producers to solicit participation in phase II. A producer agreement that explained data confidentiality and indicated producer intentions for biological sampling was signed by respondents. VMOs administered the VS questionnaire via face-to-face interviews conducted from September 10, 2012, through January 31, 2013.

D. Data Analysis

Initial data entry and validation were performed in individual NASS State offices for the on-farm questionnaire and in a centralized NASS call center for the CATI questionnaire. Data were entered into a SAS dataset. NAHMS staff performed additional data validation after data from all States were combined.

After completing VS questionnaires, data collectors sent them to the State NAHMS coordinators; the questionnaires were manually reviewed for errors and accuracy and forwarded to CEAH. Data entry and validation were performed by NAHMS staff. Data were entered into a SAS data set and the data entry edit and validation programs were executed. As with GSFQ data, NAHMS staff performed additional data validation on the entire VS visit data set after data from all States were combined.

Data analysis was performed using SAS and SUDAAN software. Responses were weighted to make inference back to the population from which the sample was selected. Sites were nested within operations and strata to account for clustering. SUDAAN uses a Taylor series expansion to estimate appropriate variances for the data that are stratified, clustered, and weighted.

E. Sample Evaluation

The purpose of this section is to provide various performance measurement parameters. Historically, the term "response rate" was used as a catch-all parameter, but there are many ways to define and calculate response rates. Therefore, the following table presents an evaluation based upon a number of measurement parameters, which are defined with an "x" in categories that contribute to the measurement.

Phase I: General Swine Farm Questionnaire

Response category	Number sites	Percent sites	Contacts	Usable[1]	Complete[2]
Survey complete and VMO consent	944	18.0	x	x	x
Survey complete, refused VMO consent	1,175	22.4	x	x	x
No hogs on June 1, 2012	915	17.5	x	x	
Out of business	33	0.6	x	x	
Out of scope	17	0.3			
Refusal of GSFQ	908	17.3	x		
Office hold (NASS elected not to contact)	151	2.9			
Inaccessible	1,094	20.9			
Total	5,237	100.0	3,975	3,067	2,119
Percent of total sites			75.9	58.6	40.5
Percent of total sites weighted[3]			71.2	55.5	32.4

[1]Usable sites—respondent provided answers to inventory questions for the site (either zero or positive number on hand).
[2]Survey complete site—respondent provided answers to all or nearly all questions.
[3]Weighted response—the rate was calculated using the initial selection weights.

Appendix I: Sample Profile

A. Responding Sites

1a. Total inventory

	Phase I: General Swine Farm Questionnaire	Phase II: VS Visit
Size of site (total Inventory)	**Number responding sites**	**Number responding sites**
Fewer than 2,000	1,230	187
2,000 to 4,999	617	182
5,000 or more	272	105
Total	2,119	474

1b. Sow inventory

	Phase I: General Swine Farm Questionnaire	Phase II: VS Visit
Size of site (total sows and gilts)	**Number responding sites**	**Number responding sites**
No sows and gilts	1,273	316
1 to 249	502	59
250 to 499	66	20
500 or more	278	79
Total	2,119	474

2. Regions

	Phase I: General Swine Farm Questionnaire	Phase II: VS Visit
Region	**Number responding sites**	**Number responding sites**
Midwest	1,308	285
East	574	100
South	237	89
Total	2,119	474

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

Appendi

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

Source: NASS 2007 Census of Agriculture.

ix III: 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, January 2015
- **Part II: Reference of Swine Health and Health Management in the United States, 2012, January 2016**
- Reference of Management Practices on Small-enterprise Swine Operations in the United States, 2012, February 2014
- Porcine Reproductive and Respiratory Syndrome (PRRS) Control in Breeding Herds, info sheet, expected fall 2016
- Feed Management, info sheet, expected fall 2016

2. Describe trends in swine health and management practices.

- Part III: Changes in the U.S. Pork Industry, 1995–2012, expected fall 2015

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

- Toxoplasma, info sheet, expected fall 2016
- Trichinae, info sheet, expected fall 2016
- Porcine Reproductive and Respiratory Syndrome (PRRS) Prevalence, info sheet, expected fall 2016
- *Salmonella*, info sheet, expected spring 2016
- *Enterococcus*, info sheet, expected spring 2016
- Generic *E. coli*, info sheet, expected spring 2016

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, January 2016

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

- Toxoplasma, info sheet, expected fall 2016
- Trichinae, info sheet, expected fall 2016
- Porcine Reproductive and Respiratory Syndrome (PRRS) Prevalence, info sheet, expected fall 2016
- *Salmonella*, info sheet, expected spring 2016
- *Enterococcus*, info sheet, expected spring 2016
- Generic *E. coli*, info sheet, expected spring 2016

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, January 2015
- **Part II: Reference of Swine Health and Health Management in the United States, 2012, January 2016**

Introduction
Terms Us

Section I: P
A. Site C

B. Breed
1. Dis
2. Dis
3. Vac
4. Infl
5. Por
syn
6. PR
7. Use

C. Nurse
1. Dis
2. Sw
3. Vac
4. Infl
5. Res
32
6. Me
fee
7. Fee
8. Ou

D. Growe
1. Dis
2. Sw
3. Vac
4. Infl
5. Res
62
6. Me
fee
7. Fee
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