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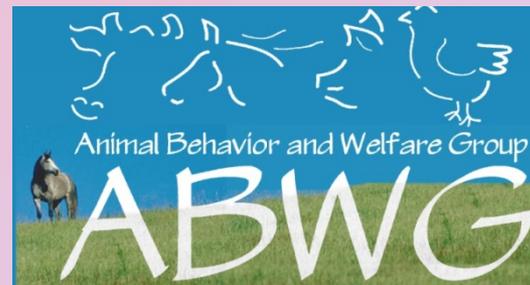


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Swine Scenario

Comparison of Housing Systems for Gestating Sows

Animal Welfare Judging Competition 2008



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Michigan State University

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Producer A: Overview

- Farm is located in Minnesota
- The farm breeds sows and supplies piglets after weaning to finishing operations



Producer B: Overview

- Farm is located in Minnesota
- The farm is part of a complete farrow-finish operation



Producer A: Personnel

- Farm manager
 - MS from the state university
 - 5 years of experience with sows
- Four-full time employees
 - Employees have an average of 4 years of experience
 - Employees turn over every 2-3 years
- Employee training
 - New employees receive an hour of introduction to the facility from the manager and instructional videos to review on their own
 - More experienced employees are given responsibility for instructing new employees in performing their duties

Producer B: Personnel

- Farm manager
 - BS from the state university
 - 15 years of experience with sows
- Six-full time employees
 - Employees have an average of 10 years of experience
 - Employees have been with the producer for an average of 7 years
- Employee training
 - First week on the job is spent shadowing manager and other workers who explain routine and demonstrate procedures
 - Manager and all employees attend local extension workshops 2-3x/year on swine production covering swine handling and managing the gestating sow

Animals

Producer A

- Yorkshire x Landrace
- 500 Bred sows and gilts
- ~200-300 Gilts for replacement animals
- 5 Boars
 - Used estrus detection

Producer B

- Yorkshire x Landrace
- 500 Bred sows and gilts
- ~125-200 Gilts for replacement animals
- 16 Boars
 - Used for estrus detection, semen collection, and limited hand breeding

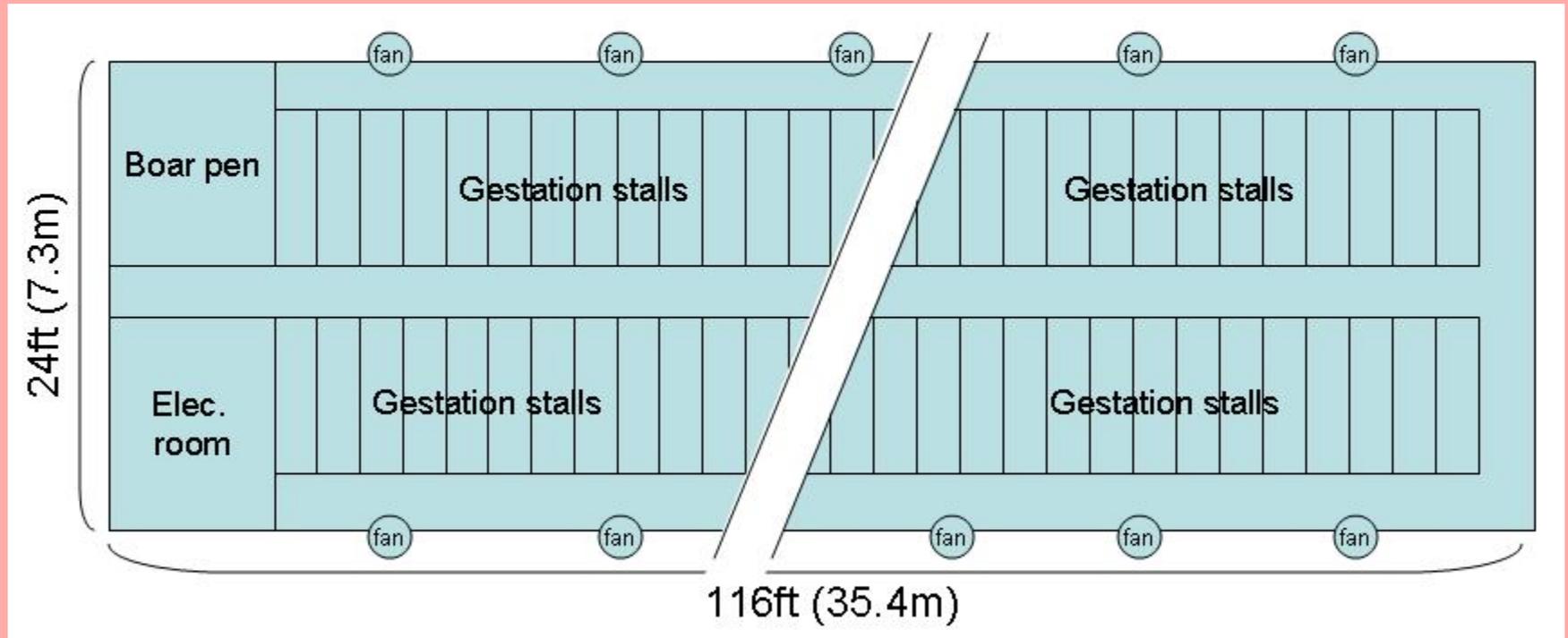
Yorkshire x
Landrace Gilts



Producer A: Stall System

- Five 24 x 116 ft (7.3 x 35.4 m) buildings house gestating sows and gilts
 - 100 stalls/building in 2 rows of 50 stalls
 - 1 boar pen/building = 8 x 8 ft (2.4 x 2.4 m)
- Heating and cooling
 - Buildings are mechanically ventilated (20 cfm/sow) in summer) using fans in the sides of the buildings
 - A sprinkler cooling system has been installed above the stalls
 - Supplemental heat has been installed in the floor beneath the sows

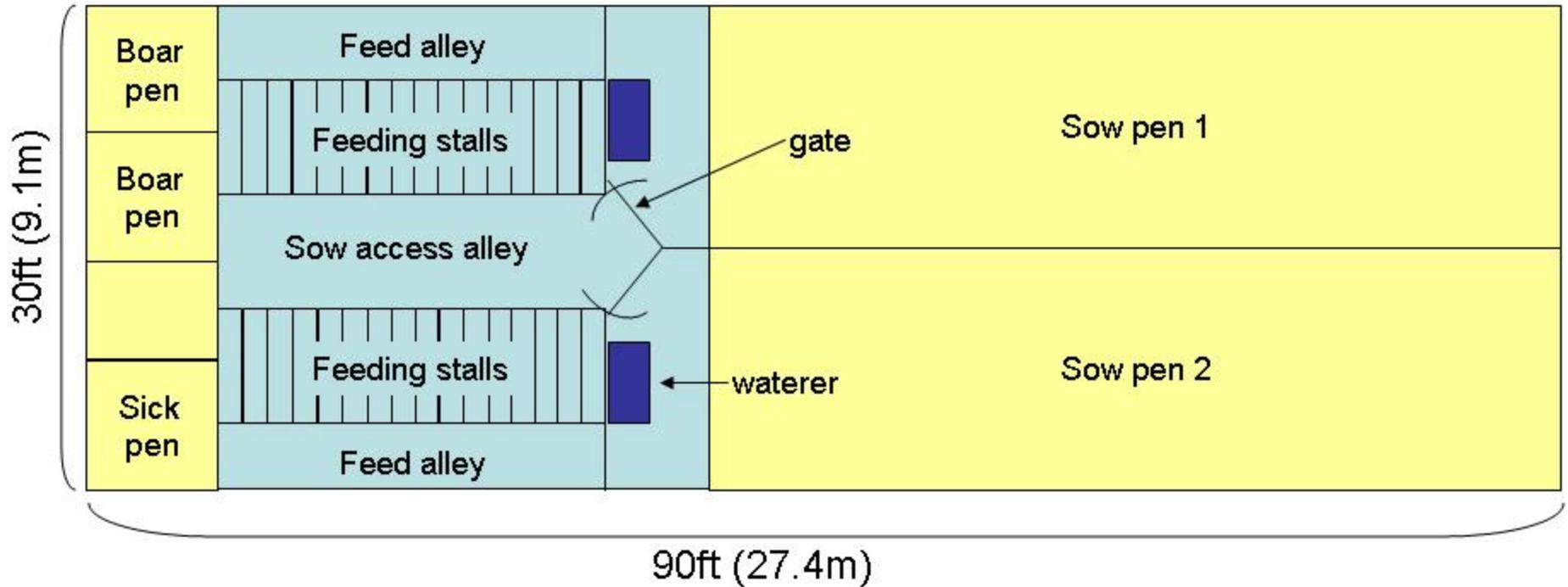
Producer A: Building Layout



Producer B: Hoop System

- Eight 30 x 90 ft (9.1 x 27.4 m) hoop barns house gestating sows and gilts
 - 2 pens/building for sows, each pen houses 32 sows
 - 2 pens/building for boars = 8 x 8 ft (2.4 x 2.4 m)
 - 1 sick pen/building = 8 x 8 ft (2.4 x 2.4 m)
- Heating and cooling
 - Hoop building is oriented north-south to catch breezes and is naturally ventilated (0-30 cfm/sow) by opening both ends of the building in summer
 - The north ends are closed in winter with a fabric curtain and the south ends can be partially closed
 - A drip cooling system has been installed over feeding stalls

Producer B: Building Layout



Yellow = deep-bedded areas. Blue = raised concrete.

Producer A: Stall System

- Gestation crates = 2 x 6.5 ft (0.6 x 2 m)
- Concrete slat flooring under all stalls, solid concrete in alleyways
- Each sow has a nipple waterer in her stall



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Producer B: Hoop System

- Gestation pens = 15 x 54 ft (4.6 x 16.5 m)
- Pens have a concrete base and are deep-bedded ~12 in (0.3 m)
 - Cornstalk or straw round bales are added when sows are first introduced, sows spread bedding themselves
 - Pens are cleaned out following each group of sows
- One insulated waterer/pen



Grouping & Breeding

Producer A

- Sows
 - Sows are individually moved into gestation stalls immediately after weaning piglets
- Gilts
 - Replacement gilts are moved from group pens to gestation stalls at 22 wks of age
- Animals are heat checked and artificially inseminated in gestation stalls

Producer B

- Sows
 - All sows in a pen are introduced to the pen at once after the last sow has weaned her litter
 - Group is static through gestation
- Gilts
 - Gilts are designated as replacement animals and housed together starting at 12 wks of age
 - Gilts are moved to the gestation hoop houses at 25 wks of age
- Animals are heat checked and artificially inseminated while locked in feed stalls
- Hand breeding occurs in boar pens

Producer A: Feeding

- Each sow has an individual feeder
- Sows are drop fed once per day (8:00am)
- Sows are fed individually based on body weight, body condition score (BCS), and stage of gestation
- Average BCS is 3-4, with ~3 sows/building near 2



Producer B: Feeding

- Sows are fed in locking feeding stalls located on a raised concrete platform adjacent to their pens
- Sows are fed once a day (8:00am)
- Sows are fed based on average weight and stage of gestation for the group
- Sows given 0.8 lb (360 g) extra feed for every 10°F (5.5°C) the ambient temperature drops below 55°F (12.8°C)
- Sows with BCS<3 given extra feed
- Average BCS is 3 with ~4 sows/pen below 3



Feed

Producer A

- Sows are fed a dry commercial diet formulated for gestating SOWS
- Sows receive no forage

Producer B

- Sows are fed a dry commercial diet formulated for gestating SOWS
- Sows consume bedding material between feedings
 - Provides roughage
 - Allows expression of rooting and foraging behaviors

Biosecurity

Producer A

- Shower-in/shower-out facility
 - Employees change into complete sets of farm clothing and boots
- Employees must not visit other swine farms within 48 h of coming to the farm
- No birds or cats are allowed in buildings
- Rodents are controlled using mechanical traps in all buildings
- No new animals have been introduced to the facility since the original animals were purchased

Producer B

- Showers are available but not mandatory
 - Employees change into farm coveralls and boots
- Employees must not visit other swine farms within 24 h of coming to the farm
- Birds nest in hoop buildings in summer
- Farm cats are sometimes present hunting rodents
- Mechanical traps are occasionally set out in feed alleys when a problem has been reported
- Several new boars have been brought in over the last 4 years

Veterinary Care

Producer A

- Producer has a vet/client/patient relationship with a local large animal practice (4 vets)
 - One regular visit/year
 - Vets are on call other times and occasionally drop by
- Sentinel animals in the herd are tested 1x/year for:
 - Porcine Reproductive and Respiratory Syndrome (PRRS)
 - Brucellosis
 - Pseudo-rabies
 - Tests so far have been negative
- Sows are wormed as needed

Producer B

- Producer has a vet/client/patient relationship with a local swine vet
 - Two regular visits/year
 - Vet is on call at other times
- Prior to being brought in, Incoming animals were tested and found negative for:
 - PRRS
 - Brucellosis
 - Pseudo-rabies
- Wormer (Hygromycin B) is given daily in feed
- Sows and gilts are dewormed with Fenbendazole (Safe-guard) 2 weeks before entering gestation pens

Vaccinations

Producer A

- Pre-breeding
 - Leptospirosis, Parvovirus, Erysipelas
 - Gilts are vaccinated 2x
 - Sows are vaccinated prior to weaning
- Pre-farrowing
 - *E. coli*, *Clostridium perfringens*, Atrophic Rhinitis, Rotavirus, PRRS, *Salmonella*, *Swine influenza virus*
 - Gilts are vaccinated 3 and 1 weeks before farrowing
 - Sows are vaccinated 1 week before farrowing

Producer B

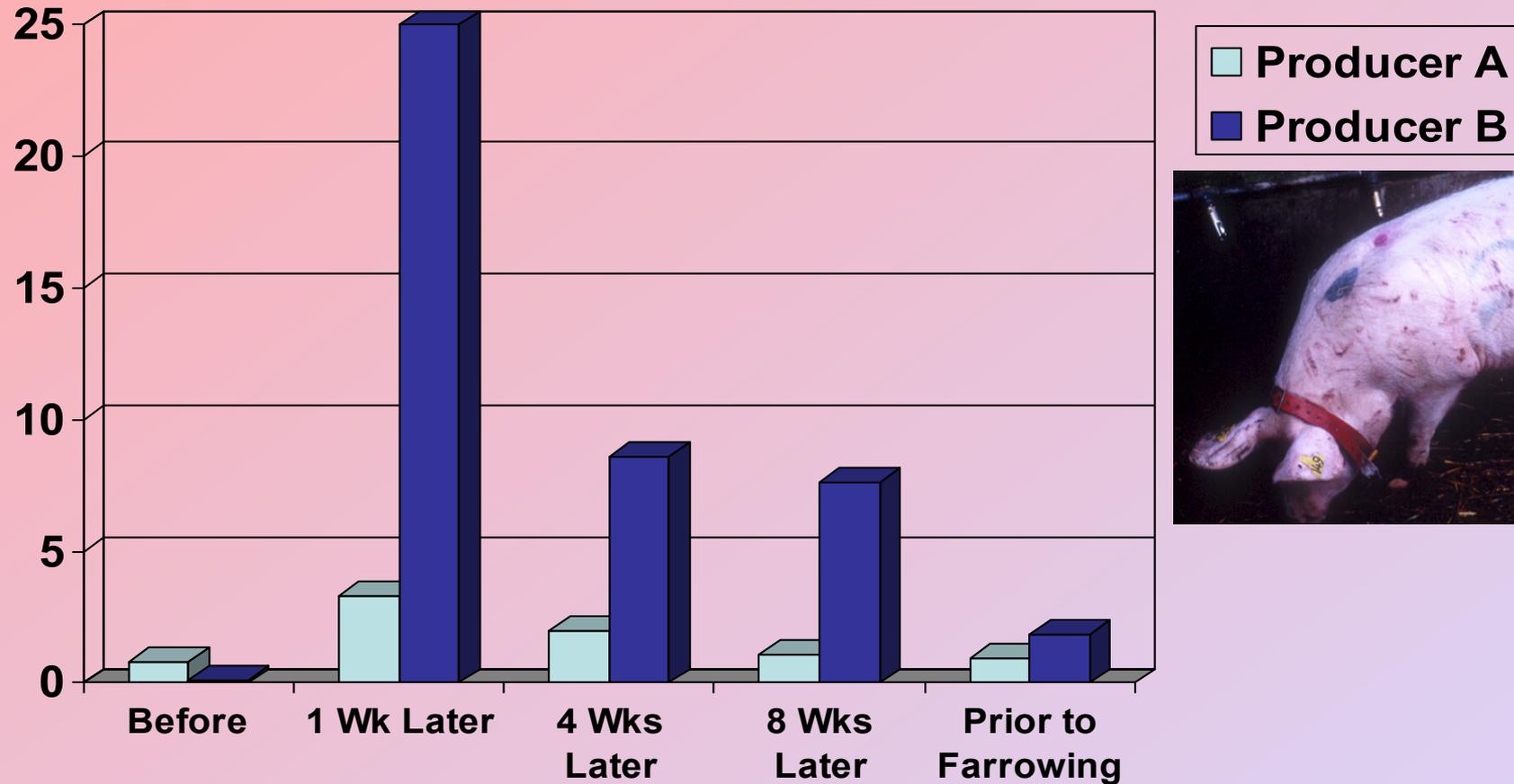
- Pre-breeding
 - Leptospirosis, Parvovirus, Erysipelas
 - Gilts are vaccinated 2x
 - Sows are vaccinated at weaning
- Pre-farrowing
 - *E. coli*, *Clostridium perfringens*, Atrophic Rhinitis
 - Gilts are vaccinated 5 and 2 weeks before farrowing
 - Sows are vaccinated 2 weeks before farrowing

General Health*

	Producer A	Producer B
Shoulder lesions %	9.2	0.8
Lame sows % (>2 on a 1-5 scale)	13.6	2.2
Inflamed eyes %	5.8	3
Coughing %	20.4	4.2
Internal parasites % (ascarids)	0.8	5
Requiring treatment %	18	10

*Reflects percent of gestating sows and gilts affected/treated in the previous 12 months

Number of Physical Injuries*



*Number of scratches, abrasions and cuts (other than shoulder lesions) before and after introduction to gestation system

Temperature Stress

	Producer A		Producer B	
Outdoor Temp	Temp at Floor	Respiration Rate	Temp at Bedding	Respiration rate
10°F (-12.2°C)	55°F (12.8°C)	32	45°F (7.2°C)	36
60°F (15.6°C)	64°F (17.8°C)	33	70°F (21.1°C)	33
95°F (35°C)	80°F (26.7°C)	52	86°F (30°C)	65

*Thermoneutral zone for sows > 220 lbs (100 kg) is 50-77°F (10-25°C)

Reproductive Measures

	Producer A	Producer B
Weaning to breeding interval (days)	4.3	6.0
Return to estrus (%)	7.4	13.2
# Piglets born alive/litter	10	10.2
# Stillborn/mummified	1.6	1.4
Average litter weight	35.9 lbs (16.3 kg)	35.5 lbs (16.1 kg)
Average # parities before culling sow	2.5	4.25

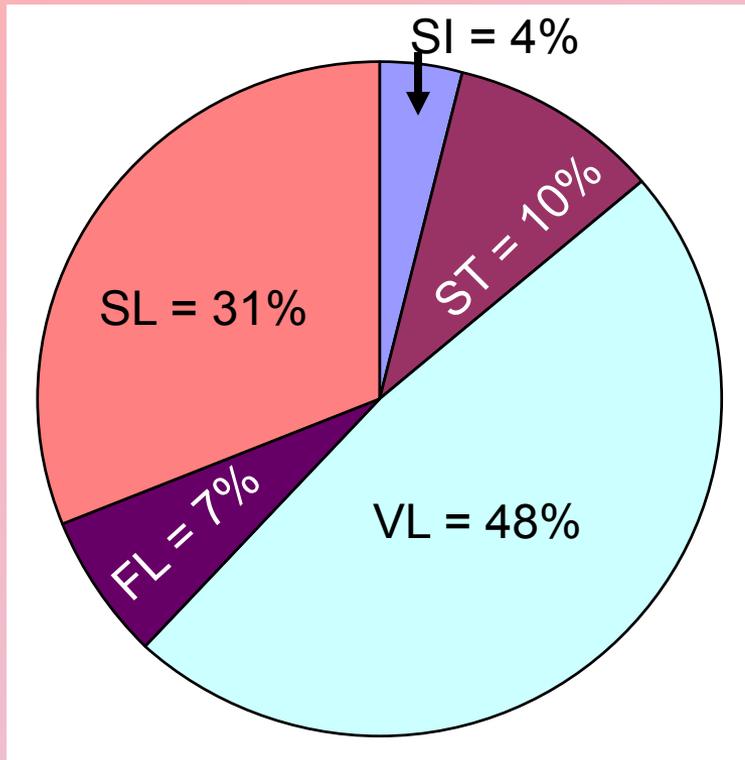
Human-Animal Interactions

- Sows' response to caretaker approaching within 3 ft (1 m) and reaching out a hand to within 2 in (5 cm) of the sow's head for 30 s while she is feeding

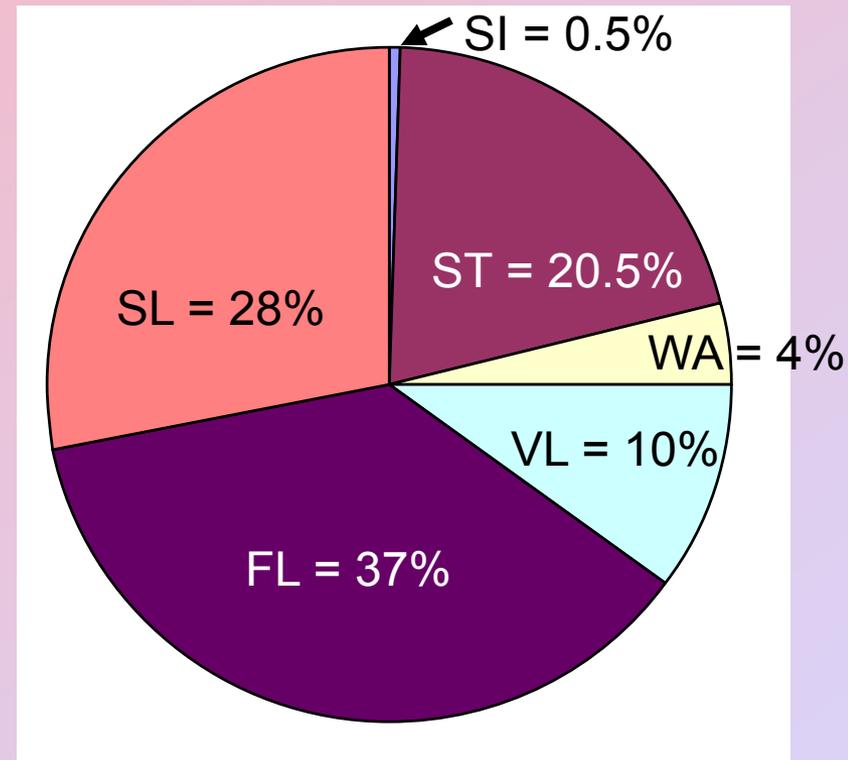
	Producer A	Producer B
Sows initially feeding (%)	75	80
Withdrawal from feed (%)	66	24
Return to feed after withdrawal (s)	13.4	1.6
Total feed time (s)	16.6	25.2
Heart rate during test (bpm)	115.5	95.5

Behavior: Postures

Producer A



Producer B



■ Sitting

■ Standing

■ Walking

■ Ventral Lying

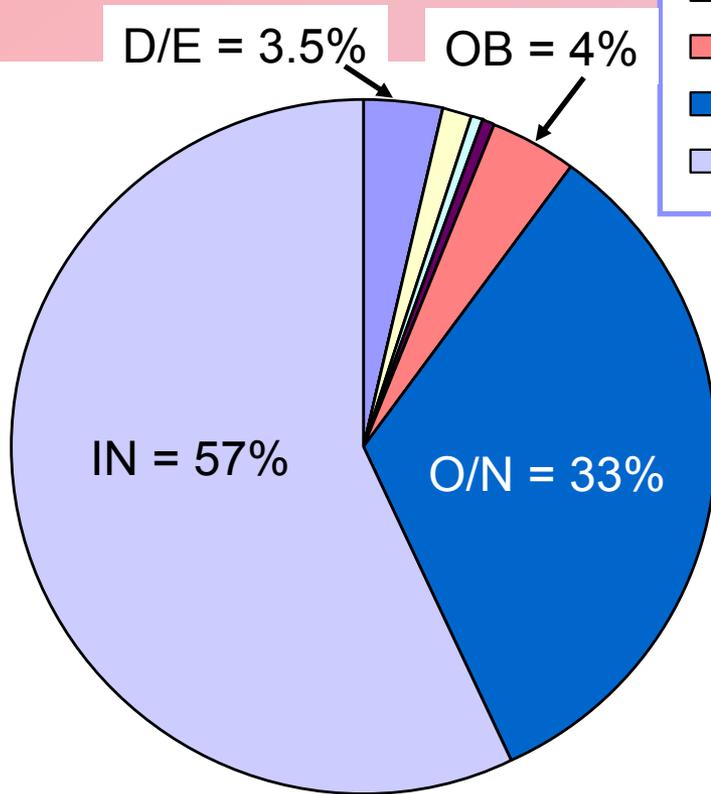
■ Full Lateral Lying

■ Semi-Lateral Lying

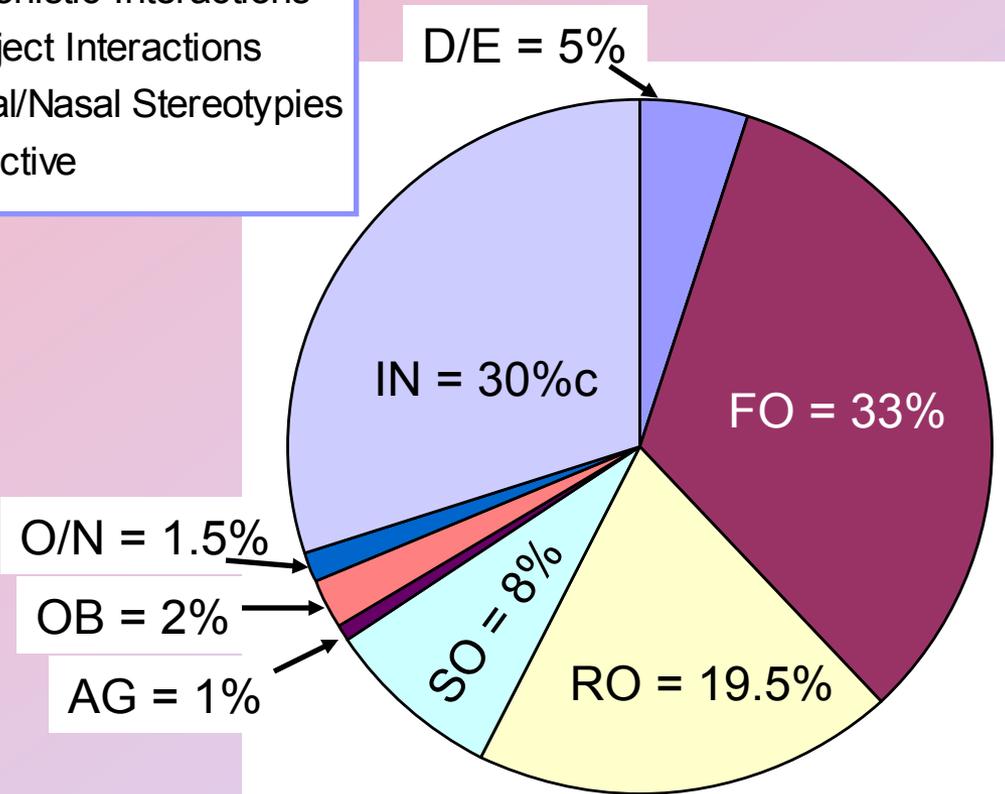
Behaviors: Activities*

- Drinking/Eating
- Foraging
- Rooting
- Social Interactions
- Agonistic Interactions
- Object Interactions
- Oral/Nasal Stereotypes
- Inactive

Producer A



Producer B



*Activities are performed while pig is active (i.e., sitting, standing, walking or lying but not sleeping).