The Swine Unit consists of approximately 125 sows producing approximately 2,500 pigs per year. Sows are located at New Deal Farm. There are 2 full time staff and a variable number of student workers.

A. Unit Buildings
   1. Temperature ranges in the unit buildings:
      a. Farrowing Barn: Preferred Range 79-90 (85 target) ° F
      b. Nursery Barn: Preferred Range 64-79. Starting temperature of 85 °F can gradually be lowered to 70 ° F (2-3 °F per week after the first week)
      c. Finishing Barn: Preferred Range 50-77 ° F

   2. The breeding/gestation building
      a. Measures 35’ x 100’ and can accommodate 80 sows indoors and 4 boars outdoors.
         1) There are eight 18’ x 14’10” pens with 8’ slatted floors (5’ concrete with lin. slots).
         2) There are five individual feeding stalls per pen.
         3) A breeding pen and feed room are also included within the building.
         4) The 6’ x 14’10” outdoor boar pens provide 3 sided north end coverage for year round housing.
      b. Ventilation
         1) It is ventilated by fans that are thermostatically controlled, according to the air temperature. Preferred Range 50-77 ° F
         2) Four pit exhaust fans operating at 1150 cubic feet per minute (cfm).
         3) There are also four side-wall exhaust fans on each wall operating at 7500 cfm. The fans are accompanied by four manually-operated louvers, on the west wall, and one heater.
      c. Waste disposal system
         1) Two flush tanks at the north end of the pit constitute the waste disposal system.
         2) Water washes the manure from under the slatted floor.

   3. The farrowing-nursery building
      a. Consists of two farrowing wings, a central area, and two nursery wings.
         1) The farrowing wings are identical and have a 16-sow capacity.
         2) Each room is 25’ X 52’ and contains 16 farrowing crates.
a) Each crate is 7’ x 5’ and is equipped with a self-feeder and automatic waterers.

3) The farrowing building is maintained at 70 to 75 degrees Fahrenheit.
4) Zone heating is provided by a heat lamp.

4. The research building
   a. Measures 100’ X 40’ and contains several rooms
      1) The ceiling is 7’ 6” high and has slots down the center for air exchange.
      2) Each is similar in function to the other units.
         a) There are three experimental nursery rooms,
         b) One experimental gestation or farrowing room. There are two different types of flooring in the farrowing wings. The floor in one row is plastic-coated expanded metal and the other row is concrete with seven 16” slats directly behind the sow (these are covered at farrowing).
         c) Two rooms available for specialized studies.
         d) A laboratory and storage rooms are also found in the building.
   b. Ventilation
      1) The evaporative cooler is located on the west end of the farrowing room.
      2) Two summer fans operated at 4000 cfm each and two winter louvers are above the ceiling.
      3) Two winter fans and four summer louvers are below the ceiling.
      4) A pit fan is located below the floor.
      5) Heaters are located at each end of the farrowing wing and an evaporative cooler provides zone cooling.
   c. Waste Disposal
      1) A flush tank is located at each end of the farrowing crates.

5. The growing-finishing building
   a. Measures 30’ x 275’ and consists of two wings and a central section for feed storage and weighing.
      1) Each wing is 30’ x 115’ with a total capacity of 620 pigs at 220 lbs.
      2) Each wing has two rows of 15 pens, 7’ x 12’4”, and 1 pen 4’ x 12’4”.
      3) The maximum capacity of each pen is 10 pigs at market weight of 240 lbs.
      4) The flooring is 5’ wide concrete slats with 1’ slots.
         a) Each pen has one nipple waterer and one 3-hole feeder.
   b. Ventilation
      1) The building has 7’ 6” ceiling, from the floor.
      2) There are adjustable slots down the center of the ceiling for air exchange with the area above and below the ceiling.
3) There is 6” batt insulation above the ceiling, 4” insulation under the roof, and 3” insulation in the inside walls.
4) There are two unit heaters that are suspended from the ceiling in each wing, one at each end.
5) Each wing has six 6,000 cfm summer fans in each wing, and six winter louvers, 28” x 34”, that are above the ceiling.
6) Below the ceiling, there are four 3,000 cfm winter fans and eight summer louvers, 48” x 28”.
7) Air is exhausted by the summer fans, above the ceiling, when the air exceeds a certain point.
8) Below this point, the winter fans exhaust air below the ceiling, and air intake is above the ceiling.
9) Below a set minimum temperature of 65° F, all wall fans are cut off.
10) A 3350 cfm pit fan is located at the end of the plenum under the aisle of each wing.
   a) The fan continuously exhausts air from below the floor.
   b) The fan has a high or low setting.

c. Waste Disposal
   1) There are two flushes at the end of each row or pens that wash manure from under the slats.

d. Facility Maintenance
   1) The maintenance crews from the main campus are responsible for repairs on all the original buildings including repairs on heater, air conditioning, and louver vents.
   2) Other repairs are done by the swine unit staff. If the heaters fail, the swine herd manager or staff will repair or Texas Tech crew will be called.
   3) The swine herd manager is available at the swine unit through the work week, and student workers from Texas Tech on the weekend.
   4) The swine herd staff will be available to come in on the weekends to check on the livestock.

B. Management/Production Procedures
   1. The New Deal Swine Breeding Unit operates as an all-in, all-out six week rotational system.

   2. Approximately 125 sows and 4 to 12 boars are maintained in the breeding herd.
      a. Gilt Management
         1) Replacement breeding gilts are purchased from a commercial breeder.
         2) Gilts are dewormed in their feed and vaccinated with a combination vaccine containing Parvo, Erysipeles, and Lepto,
         3) Gilts will be group housed for 21 days on full feed.
         4) They will be housed next to a boar so they will cycle.
            a) Any gilts remaining open after their second heat will be culled.
b. Sow Management

1) Most females originate from a commercial seed stock source.
2) Each sow is expected to produce at least 2.2-2.5 litters per year.
3) Gilts and sows are vaccinated with a combination vaccine containing Swine Influenza and Mycoplasm 2 weeks prior to farrowing.
4) Sows are brought into the farrowing building five days before their expected farrowing date (date is determined from the date of breeding and the gestation time is 114 days).
5) Sows are washed, weighed, and dewormed before they are put into the farrowing crates.
   a) Two days after entry to the farrowing unit, crates are cleaned to remove any internal parasites which may have been expelled due to the previous deworming procedures.
6) Around farrowing, sows are checked often and made to stand and drink water as soon after farrowing as possible.
   a) If the sow does not eat right away, she is feed wet feed or forage to stimulate her appetite.
   b) Sows are routinely checked twice daily for mastitis and are treated with Penicillin G at the first sign of symptoms.
   c) All treatments and observations are recorded on daily observation sheets.
7) At 18-30 days post farrowing,
   a) Sows are weighed and their total feed consumption measured.
   b) Sows are retagged if necessary and moved to the breeding-gestation building.
8) Breeding
   a) Sows are moved into the breeding-gestation and checked for heat.
   b) Prior to breeding, sows and gilts are vaccinated with a combination vaccine Parvo, Erysipeles, Lepto.
   c) Sows remaining inside are housed individually or 5 per pen.
   d) Each sow is hand mated.
      • At this point, sows may be sorted by size rather than by group.
      • Sorting by size allows all sows to have an equal chance to get feed.
9) Feeding
   a) Breeding stock females are fed 4-5 lbs. of feed daily in individual stalls.
   b) If a sow is too thin, based on body condition score, she is given 5 to 6 lbs. of feed until she reaches desired condition.

c. Piglet Management

1) Piglets may be transferred to another sow for up to three days post farrowing to equalize litter size if needed.
2) Litters are processed at 1-10 days of age (3 days preferably).
a) Piglets are also given Penicillin G and Iron by injection.
b) Needle-teeth trimming-
   • The eight needle teeth are trimmed (top 1/3 removed) with side cutting pliers.
   • The needle teeth are clipped to prevent injury to the sow caused by nursing and injury to the piglets themselves when fighting.
c) Ear notching-
   • All piglet ears are notched, using the Universal Ear Notch System as a way to permanently identify them.
   • The right ear is notched with the litter number.
   • The left ear is notched with individual pig number.
d) Tail docking-
   • All piglet tails are docked to help prevent tail biting which often leads to cannibalism.
   • The tails are amputated 1" to 3" from the base of the tail; the tail is then sprayed with iodine.
e) Naval Cord Dipping-
   • If the herdsman observes parturition and if the procedure does not interfere with a research or teaching protocol, each piglet’s naval cord may be sprayed with iodine to prevent bacteria from entering and causing disease.
f) Castration-
   • Male piglets are castrated at 10 days of age or less.
   • The skin is cut from the top of the testicle to the underside of the testicle to allow for drainage.
   • The cord is pulled or cut until it breaks.
   • The skin between their hind legs is disinfected with iodine

3) At weaning (18-30 days of age), all piglets are vaccinated with combination vaccine containing Bordetella, Pasturella, Erysipeles and Circovirus and boostered 21 days later.

4) New piglets are weaned and moved to a clean nursery.
   a) The farrowing house is emptied and cleaned.
   b) The feeders and waterers are checked to make sure they are working properly.
   c) The feeders are filled every other day or as needed to insure that the pigs always have feed.
   d) The alleys are washed and cleaned as needed.
   e) The building is cleaned with a high pressure hose before a new group from the nursery arrives.

5) Pigs may be weighed every few weeks for progress.
6) Pigs from the nursery, weighing around 50 lbs. and that are 7-10 weeks old, enter the growing-finishing building.
a) The nursery is cleaned soon after the piglets are removed to allow for the longest possible down time (this is thought to reduce disease incidence).

d. Grower Finisher Management
   1) These pigs remain in the building for 112 days or until they reach market weight (220 to 250 lbs. body weight).
   2) Every week, pigs of appropriate weight are shipped to market.
   3) Pigs may be sold to private buyers or TTU researchers before they reach market weight.
   4) Pigs may additionally be shipped to the Texas Tech University Meat Lab for classroom and judging purposes.

e. Boar Management
   1) Boars are housed on the concrete slabs outside the breeding-gestation building.
   2) Boars are fed 4 lbs. of feed daily, although some thin boars may require more.
      a) Boars are limit-fed to limit body size and to maintain libido.
   3) Boars are vaccinated semi-annually with a combination vaccine containing Erysipeles, Lepto, and Parvo.

3. Measures of Herd Performance
   a. Data may be collected on herd performance while under the different management practices.
   b. All of these types of data are completely non-invasive and they should give some descriptive information to farmers who have similar production choices in equipment or management practices.
      1) Examples of these include collecting records of:
      2) Indoor sows
      3) Pigs that are in standard housing systems (ex., different floor types)
      4) Reproductive success
      5) Effects of different semen preparation methods
      6) Effects of different floor types on pig growth, health and mortality
      7) Growth of pigs
      8) Growth of pigs while under different available bedding sources

C. Herd observation and health
   1. Daily observation-
      a. All pigs are observed twice daily for illness or injury.
      b. The swine herd manager or staff makes the decision to treat sick, diseased, injured, etc. pigs or to call the veterinarians for further diagnosis or treatment regimen.
      c. Pigs that are sick are treated according to their size and how many days until they are to be shipped to market.
1) This is due to withdrawal periods specified by the antibiotics, since the pigs are usually treated with antibiotics for two to five days.

d. All treatments are recorded in the treatment records and observed on veterinarian rounds.

e. Pigs may be treated within their home pen or moved to a separate treatment pen at the discretion of the swine staff or veterinarians based on the illness/injury and treatment regimen.

f. Veterinary staff (technician or University Veterinarians) observes all stages of pigs at least once per month.

2. Emergency Contact

   a. The emergency/disaster plan located in the unit manager office should be consulted for specific details.

   b. During instances of natural weather elements that may cause power outages, disruption in water supply etc. contact:

      Stanley Harris
      Cell: 806-786-1624

      Edward Carrasco
      Cell: 806-543-6785

      Anoosh Rakhshandeh
      Cell: 806-300-3800

3. Dystocia-

   a. Sows exhibiting signs of dystocia are given 2-3 ml of oxytocin every 20 to 30 minutes.

   b. If a sow does not respond to oxytocin, the offending piglet(s) will be pulled. A lubricated glove is used over the hand when pigs are removed from the uterus.

   c. If a sow shows signs of milking complications she is given Oxytocin, B-12, and Penicillin G.

4. Diseases

   a. Scouring piglets are treated on an individual basis with Neomycin (one dose orally per day).

   b. Severe scours may require two doses daily for three to four days.

   c. Most enteric diseases are treated with Tylan 200 in water.

   d. Respiratory problems are initially treated with Tetracycline.

   e. If any of the common diseases do not respond in a predictable time, then the advice of the University Veterinarians will be sought.

5. Quarterly bleeds are performed

   a. 25% of breeding stock and 5% of offspring, SOP014, to maintain status as a Brucellosis and Pseudorabies-free herd.

   b. Additionally blood from a percentage of these sows and/or nursery pigs will be collected at that time for PRRS and PEDV surveillance.
6. Quarantine
   a. All pigs from an outside source must be quarantined prior to entering the TTU herd including:
      1) Replacement breed stock (gilts and boars)
      2) Pigs brought in specifically for research projects
   b. Pigs will be housed in the outside dirt pens behind the TTU dairy barn or in a location approved by the veterinarian staff prior to bringing the pigs in.
   c. Quarantine must last a minimum of 30 days
   d. Pigs will be bled and tested negative for Brucellosis, PRRS, and PEDv at the expense of the investigator.
   e. Specific personnel must be designated to observe and feed/water quarantine pigs and must not enter TTU swine facilities or the feed mill
      1) If separate personnel cannot be designated as the case with the swine staff then:
         a) special attire and equipment must be designated for the quarantine area
         b) quarantine pigs should be taken care of at the end of the day to avoid re-entering the herd

7. Biosecurity
   a. All swine unit personnel must wait a minimum of 72 hours to enter TTU swine facilities if they have been in contact with pigs not housed at the TTU swine farm including:
      1) Entering other swine facilities but not handling pigs
      2) Going to stock shows, judging contests, etc.
      3) Owning pigs yourself
   b. All swine unit personnel must change into TTU owned coveralls and boots to enter the facilities
      1) Personnel are required to shower out of the facilities and may be required to shower in
      2) Persons other than swine unit personnel shall follow the requirements set out in IACUC Policy 01: Biosecurity at the New Deal Swine Unit and IACUC SOP063
   c. If equipment has been used at another swine farm and then to be used in the TTU Swine farm then it must be sanitized with a bactericidal agent prior to being taken into the facilities

D. Veterinarian-Client-Patient Relationship
   1. The farm staff agrees to receive advice and implement herd health programs recommended by the University Veterinarian
2. A routinely updated list of Animal Health Products approved by the Veterinary Staff will be kept onsite, in the unit manager’s office.
   a. Vaccinations
      1) Gilts: 6 Months to pre-breeding
         a) Leptospirosis, parvovirus and Erysipelas. (5 and 2 weeks prior to breeding)
         b) *Mycoplasma hyopneumoniae/PCV2* (5 and 2 weeks prior to breeding)
         c) *Clostridium perfringes Type C and E.Coli* (5 and 2 weeks prior to farrowing)
      2) Replacement Gilts
         a) Same as above
         b) Ileitis
      3) Sows:
         a) Swine Influenza Virus (SIV)
         b) Leptospirosis, parvovirus and erysipelas (At weaning)
         c) *Clostridium perfringes Type C and E.Col* (5 and 2 weeks prior to farrowing)
         d) Optional vaccinations: Mycoplasmal pneumonia, Transmissible Gastroenteritis (TGE)
      4) Nursery
         a) Bordetella, Pasturella and erysipelas (At weaning)
         b) *Mycoplasma hyopneumoniae/PCV2* (At weaning and again 3 weeks post weaning)
      5) Boars
         a) Leptospirosis, parvovirus and Erysipelas (2 times yearly)
   b. Deworming
      1) Routine Treatment of Adult Pigs
         a) Routine treatment of adult pigs should be carried out every six months, and if possible either moved to clean pen or the pen steam cleaned
      2) Growing Pigs
         a) Growing pigs should be treated at 8 wks then every 2 months until maturity.
      3) Sows and gilts
         a) Should be treated 14 - 21 days before farrowing.
         b) Gilts should also be treated 7-14 days before going to the boar.

E. Euthanasia
   1. When properly conducted using the appropriate firearm, euthanasia by gunshot produces immediate loss of consciousness and rapid death.
a. Gunshot is an effective, low-cost method of euthanasia when properly performed. Firearms are readily available in most areas. Human safety is the primary concern with the use of gunshot for euthanasia.
b. Proper training on firearm safety and use is imperative and gunshot should only be performed by personnel who have had appropriate training.
c. This form of euthanasia is intended for larger pigs such as the grower pigs, finishing pigs, sows and boars that weigh more than 12 lb

2. There are three possible sites for conducting euthanasia in swine by gunshot or captive bolt:
d. Frontal, temporal, and from behind the ear toward the opposite eye.
e. The frontal site is in the center of the forehead slightly above a line drawn between the eyes. The projectile should be directed toward the spinal canal.
f. The temporal site is slightly anterior and below the ear.
g. Specific sites may vary slightly according to breed.
h. When the alternate site behind the ear is chosen, a .22 caliber firearm loaded with a solid-point bullet may be used.

3. Carbon Dioxide Gas
   a. Piglets and nursery pigs less than 10 weeks of age or less than 70 lb can be euthanized by placing the pigs in a chamber filled with CO2 gas.
   b. Pigs will be left in the chamber for a minimum of 5 minutes or longer as needed for effective euthanasia.

4. Blunt force trauma
   a. Is an acceptable form of euthanasia in suckling piglets weighing less than 12 lb.

F. Transportation
   a. The swine unit transportation system consists of:
      1) Three gooseneck trailers,
      2) Two pickup trucks (one for hauling and one for farm use only),
      3) Two hydraulic trailers
   b. Onsite animal movement (i.e. from barn to barn or pen to pen)
      1) Pigs moving between farrowing and nursery will be transported in deep well cart for the short distance that they are transported.
      2) Pigs moving between buildings will be placed on the hydraulic trailer.
   c. Offsite animal movement
      1) The only time a pig will enter a gooseneck trailer will be when it is leaving the farm.
      2) A maximum of forty-five pigs are placed on a gooseneck trailer at a time.
      3) Loading and unloading procedures may also consist of moving pigs from trailer to trailer or by herding them out (by using herding boards) from the sides of the trailer.
d. Normal/Routine repairs of the vehicles and trailers are done by the swine herd manager or staff when possible, or the personnel who last used the trailers or vehicles.
e. Whenever one of the trailers is taken off site and/or hauled non-herd pigs or other livestock, the trailer will be cleaned according to SOP089 Swine Trailer Bio-Security Procedures, before it is brought back onsite by the personnel using the trailer.

G. Nutrition
   All pigs will be fed age-appropriate diets that contain sufficient levels of essential nutrients according to NRC Swine