

Vaccinations for the Swine Herd

Swine producers should vaccinate their pigs to prevent or decrease economic loss from important infectious diseases. Infectious diseases are caused by microorganisms such as bacteria or viruses. Vaccines contain “safe” microorganisms which are injected into a pig to prepare its immune system to resist disease. The safe microorganisms in vaccines are either killed or modified-live. This means that they will activate the immune system but not cause the disease.

Antibiotics, such as penicillin or tetracycline, are not vaccines. Vaccines are given to prevent a disease before it occurs. Antibiotics are given to treat a disease which has already occurred.

When To Vaccinate

Pigs should be vaccinated for a disease before they will encounter the microorganisms causing it. It takes from 10 to 21 days after vaccination for the pig to mount a protective immune response. The exact length of time depends on the pig’s age, the vaccine itself, and whether the pig has been vaccinated before.

For example, leptospirosis (lepto) is a disease which can cause abortion. Sows and gilts should be vaccinated against *Leptospira* bacteria before breeding. Many lepto vaccines call for gilts to be vaccinated twice before breeding, while sows should receive a single booster vaccination at every weaning.

For some piglet diseases, such as scours caused by *E. coli* bacteria, often the best strategy is to vaccinate the sow before farrowing. The vaccination increases the concentration of antibodies in the sow’s colostrum, or first milk produced after farrowing. These antibodies are absorbed into the piglets’ bodies, providing temporary protection until their immune systems are able to provide their own. They also provide local protection against intestinal disease by bathing the piglets’ gut in antibody-rich milk throughout lactation.

Which Vaccinations Are Necessary

Vaccinating for every possible disease is not cost effective. Vaccinate to prevent diseases which have a high risk of occurring, not diseases with a low risk.

Work closely with your veterinarian to custom design a vaccination program to best fit your herd’s needs.

The vaccinations in Table 1 are recommended for most herds. These diseases are of high enough risk to justify vaccination at the indicated stages of production. In order to maintain an adequate level of protection in the herd, booster vaccinations may have to be given. Exact recommendations on when to vaccinate will vary depending on the brand of vaccine used. **Read and follow vaccine labels carefully!**

Table 1. Routinely Recommended Vaccinations.

Production Stage	Disease*	When To Vaccinate
Gilts prebreed	Leptospirosis Parvovirus Erysipelas	Twice before breeding
Sows prebreed	Leptospirosis Parvovirus Erysipelas	Before breeding (at weaning)
Boars	Leptospirosis Parvovirus Erysipelas	Twice a year
Gilts prefarrow	<i>E. coli</i> Atrophic rhinitis	Twice before farrowing
Sows prefarrow	<i>E. coli</i> Atrophic rhinitis	Before farrowing
Baby pigs	Atrophic rhinitis	Once or twice before weaning
Grower (40-100#)	Erysipelas	When purchased as feeder pigs

*See **Diseases And Microorganisms** on page 3 for a short description.

Several other vaccinations could be recommended by your veterinarian if the disease has been diagnosed in the herd and if an effective vaccine is available. The cost of the vaccine and the labor to administer it should be

weighed against the expected benefit. Such diseases might include:

- *Actinobacillus pleuropneumoniae*.
- *Clostridium perfringens*.
- Encephalomyocarditis (EMC) virus.
- *Haemophilus parasuis*.
- *Mycoplasma hyopneumoniae*.
- Porcine reproductive and respiratory syndrome (PRRS).
- Pseudorabies.
- Rotavirus diarrhea.
- *Salmonella*.
- *Streptococcus suis*.
- Swine dysentery (bloody scours).
- Swine influenza virus.
- Transmissible gastroenteritis (TGE).

See **Diseases And Microorganisms** on page 3 for a short description.

In a few cases, your veterinarian might recommend that an “autogenous” vaccine be custom-made from a microorganism isolated from diseased pigs on your farm. Such vaccines should be prepared by an approved company. Your veterinarian will only recommend such a step if control of certain diseases on your farm has not been accomplished by other measures or if a commercial vaccine has not been effective.

Other Tips For A Successful Vaccination Program

Practice good pig management. Vaccinations are not a substitute for good pig management. If a pig’s immune system is weakened by a stressful environment or inadequate nutrition, an overwhelming disease challenge can cause disease even in a vaccinated pig. In many cases, diseases can be better controlled by good sanitation and management than by vaccination alone.

Good management includes a biosecurity plan to keep the farm isolated from the introduction of new diseases. Good management also includes the use of all-in–all-out pig flow, so that pigs of different ages do not commingle and trade diseases. For further information, see your county Extension agent for a copy of Extension Circular ANR-847, “Scheduling All-In–All-Out Swine Production.”

Follow label directions. Store and handle vaccines according to label directions. Keep them refrigerated or cooled, as required, and out of sunlight. Improper storage can make a vaccine ineffective.

Read the label to see what diseases and microorganisms the vaccine is designed to protect against. Looking only at the trade name of a vaccine can cause errors. Some producers may over-vaccinate for one disease or fail to vaccinate for another.

Review your farm vaccination program. Use Table 2 to outline the vaccinations you are currently

Table 2. Farm Vaccination Review.

Date completed _____

Production Stage	Product Name/ Vaccine Components	Route Of Administration	Dosage	When Administered	Person Responsible	Preslaughter Withdrawal (days)
Gilts prebreed						
Sows prebreed						
Boars						
Gilts prefarrow						
Sows prefarrow						
Baby pigs						
Pigs at weaning						
Grower (40-100#)						
Finisher (100#-market)						

Source: Pork Quality Assurance Guide, Level III (1994), used with permission from the National Pork Producers Council.

using in your herd. At each production phase list the vaccine product name, the route of administration, the dosage, when it is given, the person responsible for giving it, and the preslaughter withdrawal time. Use this form to go over your vaccination schedule with your veterinarian. A good rule of thumb is to reevaluate the vaccination program at least once a year. The National Pork Producers Council sponsors a Pork Quality Assurance (PQA) program, which includes this farm vaccination review. All swine producers are urged to enroll in the PQA program. Contact your veterinarian or county Extension agent for details.

Use correct injection techniques. To ensure protection against disease, vaccines must be administered properly. Follow these techniques:

- Ensure proper restraint of the animal prior to injection.
- Ensure proper syringe adjustment.
- Ensure proper needle placement onto the syringe.
- Avoid swelling and developing abscesses at the injection site.
 - Use properly cleaned needles.
 - Inject only into clean and dry areas.
 - Prevent contamination. Don't use the same needle to inject pigs and remove product from multi-dose vials.

- Consult with your veterinarian about potential adverse drug and vaccine reactions.

See Table 3 for information on types of injections and specific placement and injection techniques.

Use proper needle sizes. Needles come in varying gauges and lengths (Figure 3). Select the needle size by determining the injection technique and the production stage. See Tables 4 and 5.

To avoid bent or broken needles:

- Ensure proper restraint of the animal prior to injection.
- Replace bent needles; they are prone to breaking.
- Replace needles after injecting 20 pigs.

Diseases And Microorganisms

Routinely vaccinate for:

Atrophic rhinitis (*Pasteurella multocida* type A and toxigenic type D and *Bordetella bronchiseptica*): Infection with these organisms may cause deviation of the snout and increased respiratory disease on some farms. Vaccinate females before farrowing so they will pass on protection to their piglets in the colostrum (first milk after farrowing). Vaccinate pigs before weaning, usually twice.

E. coli: Infection of baby pigs with types of this bacteria from fecal contamination of the environment

Table 3. Injection Types And Placement.

Type Of Injection	Placement	Placement Tips
Subcutaneous (SQ)	Under the skin	<ul style="list-style-type: none"> • Inject only into clean, dry areas. • Use the loose flaps of skin in the flank and elbow of small pigs (Figure 1). • Use the loose skin behind the ear of sows. • Slide needle under the skin away from the site of skin puncture before depositing the compound.
Intramuscular (IM)	Into the muscle	<ul style="list-style-type: none"> • Use a spot on the neck just behind and below the ear (Figure 2). • Avoid IM injections to the ham. Damage to the ham can result in condemnation of the meat cut. • Use proper needle size to ensure medication is deposited in the muscle.
Intraperitoneal (IP)	In the abdominal cavity	<ul style="list-style-type: none"> • Use only upon veterinary instruction and guidance because serious injury to abdominal organs can occur.
Intravenous (IV)	In the vein	<ul style="list-style-type: none"> • Use only upon veterinary instruction and guidance because serious injury to the hog can occur.
Intranasal (IN)	In the nasal passages	<ul style="list-style-type: none"> • Use a needle to withdraw the product from the bottle; remove the needle from the syringe, and use the recommended application tip for administration. • Keep the pig's head tilted upward during and immediately following administration so that the product will reach the deep nasal passages.

Source: "Injection Reference Chart," Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

can cause severe scours. Vaccinate pregnant females before farrowing.

Erysipelas (*Erysipelothrix rhusiopathiae*): Infection with this bacterium can spread throughout the body of growing pigs. It can cause death or can localize in the joints, causing chronic arthritis or heart infections. With the “diamond skin disease” form of infection, the skin may become discolored and parts may slough off. If pigs survive, their growth rates may be retarded. Vaccinate pregnant females before breeding, and if purchasing feeder pigs of unknown background, vaccinate them upon arrival.

Leptospirosis: Infection of susceptible pregnant females with the *Leptospira* bacterium may result in abortion. Protect females by vaccinating gilts before first breeding and sows at each subsequent weaning for these five “serovars” of leptospirosis: *L. pomona*, *L. grippotyphosa*, *L. canicola*, *L. icterohaemorrhagiae*,

Table 4. Needle Sizes For Intramuscular Injections.

Production Stage	Gauge	Length
Baby pigs	18 or 20	5/8 in. or 1/2 in.
Nursery	16 or 18	3/4 in. or 5/8 in.
Finisher	16	1 in.
Breeding stock*	14 or 16	1 in. or 1 1/2 in.

*Needle size depends on backfat depth and method of restraint.

Source: “Injection Reference Chart,” Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

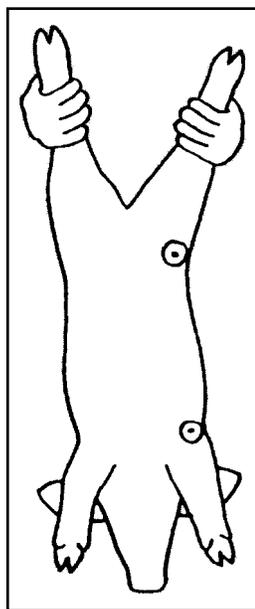


Table 5. Needle Lengths For Subcutaneous Injections.

Production Stage	Length
Nursery	1/2 in.
Finisher	3/4 in.
Sows	1 in.

Source: “Injection Reference Chart,” Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

Figure 1. Location of preferred sites for SQ injections.

Source: “Injection Reference Chart,” Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

and *L. hardjo*. Most commercial vaccines protect against these serovars. Vaccinate boars twice a year. Another serovar, *L. bratislava*, has been implicated in some herds, but routine vaccination for it is not recommended unless suggested by your veterinarian.

Parvovirus: This virus can cause reproductive failure through embryonic and fetal death and fetal mummification. Protect pregnant females by vaccinating before breeding.

Vaccinate for the following diseases only if they have been diagnosed and if the vaccine is felt to be cost-effective:

Actinobacillus pleuropneumoniae (previously known as *Haemophilus pleuropneumonia*): This bacterium causes pneumonia which can either result in sudden death in grow-finish hogs or in slow growth and extended days to market.

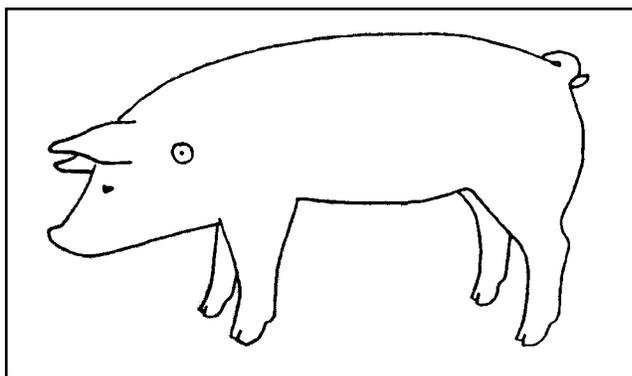


Figure 2. Location of preferred sites for IM injections.

Source: “Injection Reference Chart,” Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

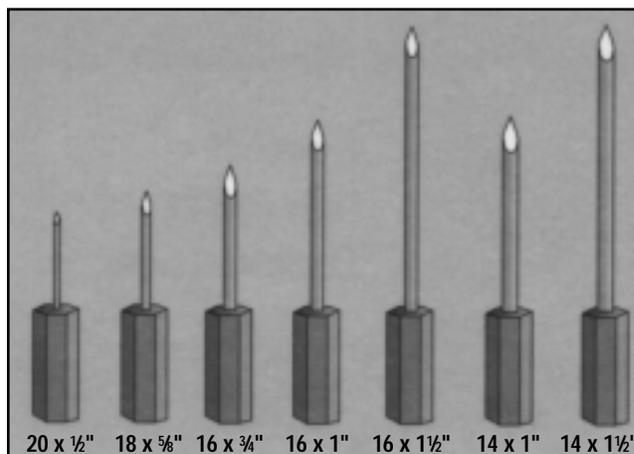


Figure 3. Needle sizes, actual size.

Source: “Injection Reference Chart,” Pork Quality Assurance Program, used with permission from the National Pork Producers Council.

Clostridium perfringens: This bacterium can infect nursing piglets, resulting in either sudden death or a chronic diarrhea.

Encephalomyocarditis (EMC) virus: This virus may cause heart and brain damage of baby pigs, fetuses, or older hogs that have no immunity.

Haemophilus parasuis: This bacterium causes “Glasser’s Disease” in nursery and grow-finish hogs. These pigs can have infection in several organ systems, such as heart, lungs, joints, or brain.

Mycoplasma hyopneumoniae: This microorganism is neither a bacterium nor a virus. It can cause “enzootic pneumonia” in grow-finish hogs, resulting in coughing and possibly poorer growth and feed conversion. Some infected pigs may progress to a more serious pneumonia caused by infection from other microorganisms, such as *Actinobacillus pleuropneumoniae*.

Porcine reproductive and respiratory syndrome (PRRS): This was first known as the “Mystery Swine Disease.” Late term abortions, weak piglets, pneumonia in nursery pigs, and poor resistance to other infectious diseases are some of the many herd problems associated with this virus.

Pseudorabies: This virus infects the nervous system of pigs. When the virus first occurs on a farm, the death rate in young pigs can be high, although few adults die. Reproduction is significantly affected, with in-

creased abortions, mummies, and stillbirths. **Since swine pseudorabies is a disease the government is attempting to eradicate, vaccination must be approved by state and federal regulatory agencies.**

Rotavirus diarrhea: Rotavirus can cause diarrhea in nursing and weaned pigs.

Salmonella: Salmonellosis in swine is caused mainly by two organisms: *S. choleraesuis* and *S. typhimurium*. These bacteria can cause severe sickness in the form of bloody diarrhea, pneumonia, or widely spread infections throughout the entire body.

Streptococcus suis: This bacterium commonly causes nervous system disease (depression, tremors, and convulsions) in nursery and grower pigs. It may cause chronic arthritis, heart infection, stunting, and poor growth.

Swine dysentery (bloody scours): Bloody scours of grow-finish pigs are caused by the spirochete organism *Serpulina hyodysenteriae*.

Swine influenza virus: This virus causes a sudden onset of coughing, which rapidly spreads through the herd and runs its course in 3 to 7 days. Some death loss and stunting may occur.

Transmissible gastroenteritis (TGE): The TGE virus causes diarrhea and vomiting in pigs of all ages. Death loss is severe in nursing pigs, while older pigs may survive.



ANR-902

This publication was prepared by James G. Floyd, Jr., *Extension Veterinarian*, Associate Professor, Animal and Dairy Science, Auburn University.

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

Issued in furtherance of Cooperative Extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, and other related acts, in cooperation with the U.S. Department of Agriculture. The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) offers educational programs, materials, and equal opportunity employment to all people without regard to race, color, national origin, religion, sex, age, veteran status, or disability.

UPS, 3M13, Rep. 7:96, ANR-902