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SWINE REPRODUCTION: THE SOW



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SWINE PRODUCTION today is a tremendously complex and competitive business. It is no longer a matter of throwing leftover feed, hay and household scraps over the fence and expecting the sow to live and produce a few baby pigs on this meager ration. Today is the day of maximum production where efficiency is a must if you as a producer are going to pay for the new confinement systems, baby pig nurseries, automatic feeding systems, etc.

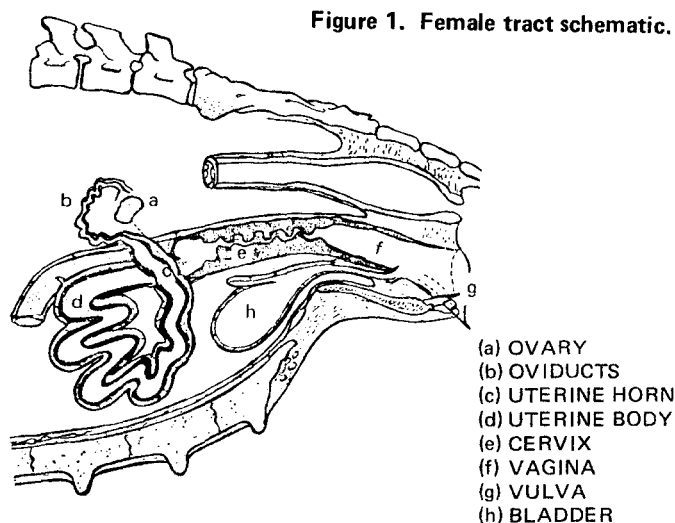
The most important factor determining economic returns is the number of baby pigs weaned per sow. It is up to these baby pigs to pay for the sow's keep and provide a profit.

There are many new management techniques available to help increase litter size. But, before these principles can be adopted, a knowledge of the way the sow's reproductive system operates is necessary to make the best use of these new management techniques.

REPRODUCTIVE PHYSIOLOGY OF THE SOW

The sow has many complicated responsibilities in reproduction. Her body should be thought of as a factory for producing baby pigs. As with any factory, the better the job of management, the larger the profit.

Figure 1 illustrates the parts of the sow's reproductive tract. The ovaries are where the eggs, which eventually wind up as baby pigs, are produced. The sow is born with the potential for these ovaries to produce far more eggs than she will ever need in her lifetime. The ovaries resemble a sack of marbles. They are suspended in the body near the backbone, in front of the pelvis.



There is very little activity on the ovaries until about 2-3 months of age. At this time, small blisters (follicles) start to cover the surface of the ovaries. Inside each of these follicles is a developing egg that contains one-half of the genetic information that is needed to make up a new individual. The sperm from the male supplies the other half.

The follicles on these ovaries, in addition to housing the developing eggs, also secrete the female hormone estrogen. Estrogen circulates in the blood stream and is responsible for the traits that cause a gilt to look and act like a gilt. This hormone acts much the same way as testosterone does in the boar. Estrogen is also responsible for bringing the gilts into heat. Heat is that period of time when the sow will accept the boar.

As the follicles on the ovaries continue to grow and mature, they receive a signal from the sow that they must rupture (ovulation) and release the egg inside. When this happens, the liquid that was contained in these follicles is expelled and leaves small

hollows on the surface of the ovaries which later develop into corpora lutea. These sites (corpora lutea) now start to produce the hormone of pregnancy, progesterone. Progesterone is responsible for maintaining pregnancy. If this hormone fails to be produced, the gilt or sow will abort the pregnancy.

When these follicles rupture, they release the eggs contained inside. The eggs are trapped by finger-like projections that surround the ovaries. These projections form a funnel that collects the eggs. The eggs then begin their journey to the uterus. The tubes the eggs must pass through are called the oviducts. The oviducts are small, twisting tubes about 10 inches long. It is during this journey to the uterus that the eggs from the sow and the sperm from the boar will unite. This process is called fertilization.

Generally, mating occurs and the sperm are deposited in the female before the eggs are released from the ovary. The sperm can live in the female for about 40 hours, but the unfertilized egg can live only about 12-14 hours after ovulation. Nature has designed the reproductive system in such a way that when the eggs are ovulated the sperm have already entered the oviduct and await the egg for fertilization.

The uterus is a warehouse where the developing embryos are stored and nurtured until the time of birth (parturition). The uterus is a muscular sac composed of two uterine horns each 3-5 feet in length. The uterine horns join to form a "V" at the uterine body. The new embryos move into the uterine horns about 48 hours after ovulation and arrange themselves much like peas in a pod. It is possible for the fertilized egg to move from one horn to the other before they become attached to the uterine wall.

About 12-14 days after the sow has been bred, the uterus must signal the sow that she is pregnant. If this signal is not given, the corpora lutea will degenerate and the sow will return to heat. If this signal does occur, pregnancy will likely be maintained and the embryos will be carried for 114 days until the sow gives birth.

At the base of the uterine body is a very muscular opening called the cervix. The cervix is about 6 inches long and during pregnancy is filled with a thick mucous plug. This plug plus the tremendous muscularity of the cervix prevents the entry of any objects or particles which could interfere with pregnancy. Near the time of birth the cervix will be

stimulated to open and allow for the delivery of the baby pigs.

The vagina joins the cervix with the vulva, the outside opening for both the urinary and genital tracts. It also serves to receive the penis at the time of service and is the final passage-way for the fetus at the time of birth.

PUBERTY

Puberty is the age at which the gilt begins to show reproductive activity. Two primary factors that influence when a gilt reaches puberty or the onset of first heat are age and weight. In the past, if a gilt reached puberty at six months of age, she would weigh about 220 pounds. It has been demonstrated that if gilts are severely under fed they won't come into heat until a much later age, but it is not true that extreme over-feeding will bring them into heat at a younger age. Over-feeding does not increase chances for early attainment of puberty. A sensible ration would allow gilts to gain about 1¼ pounds per day from 4-5 months of age and allow them to reach puberty at 6-8 months of age.

Gilts will show their first true heat between 6-8 months of age. Gilts are often thought to be in heat much sooner because they show swelling and redness of the vulva, but generally they will not accept a boar, so it isn't a true heat.

When the gilt reaches this age and weight, the ovaries have developed to where they are capable of producing eggs. The gilt will then experience a true heat period (estrus). A true heat period is when the gilts will accept the boar. This period (19-23 days) is called the estrous cycle and represents the time from one estrus period to the next. These cycles will continue every 19-23 days unless they are interrupted by pregnancy.

True heat or estrus is brought about by a combination of things, but is primarily due to the estrogen being produced by the growing follicle on the ovary. The estrus period lasts 40-60 hours and is the only time a gilt or sow will accept the boar. This is also the time the follicles rupture and release the eggs.

Gilts tend to have shorter heat periods, with sows just weaned having longer heat periods (65-70 hours). Sows will normally ovulate 30-40 hours after the beginning of heat.

