FACT SHEET

PREGNANCY TESTING

Pregnancy testing is a way of checking of what you think is going on really is going on....i.e. making sure that a sow is pregnant. Even if you are getting very good farrowing rates, it always pays to pregnancy test. Production losses associated with empty or non-productive pigs can be extremely costly and the aim on farm is to minimise these non-productive days (NPD). The cost of a non-productive day can differ from farm to farm, but have been calculated (depending on the source of the calculations) to be anything from $3 to $10 per NPD. Even on the most successful farms, some sows will fail to conceive or carry a litter through to term. The sooner these sows are identified, the sooner that management decisions can be made to handle them within the system. With the industry move away from gestation stalls, one of the management protocols that may have to change is how to best preg-test sows within these systems. Whether you cull or re-mate these sows will depend on many things including the farm's breeding policy, sow parity, previous breeding performance etc. The first issue is to find them.

Oestrus Detection

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Probably the best (and oldest, cheapest and very reliable method when carried out properly), for detecting non-pregnant sows around 21 days post-insemination, is oestrus detection conducted in the presence of a mature, smelly, sexually aggressive boar. Oestrus detection when carried out correctly by an experienced stockperson, generally has an accuracy of above 95%. But with poor technique or over worked or poorly trained stockpeople, this value can be much lower.

Rectal Palpation

Before more technological advanced methods became more readily available rectal palpation was suggested as a method to diagnose pregnancy. This method is more commonly used with cattle but has not been commonly used with pigs; a major disadvantage is that the rectum and pelvis of gilts and lower parity sows tends to be too small for this method to be used. Pregnancy diagnosis is based on rectal examination of the cervix and uterus as well as an assessment of certain arteries (pulse rate, tone, thickness). This method is only about 85% effective when performed between 21-30 days post insemination, and is most accurate when performed after 90 days insemination, but at that stage, if you couldn't pick the pregnancy visually, you probably need your eyes tested. This method could only be used if sows are confined in a testing stall and must be carried out by a skilled and experienced person.

Amplitude depth or A-mode ultrasonography machines

These machines use ultrasonic waves to detect the fluid –filled (i.e. pregnant) uterus. As a rough guideline, the probe is placed on the high part of the udder just barely under the back leg, with the probe being directed toward the back-bone of the sow (Figure 1).

The reflected waves go back to the probe and are converted into an electrical signal, which is then

converted to a beep or a flash of light or series of lights. These machines are most accurate between 30-75 days post insemination. A full bladder or large amounts of fluid in the gut can give false positive results.

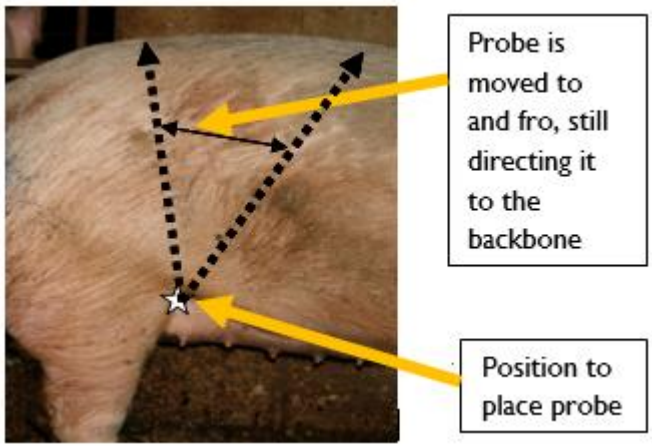

Figure 1. Probe placement for sow pregnancy testing.

Doppler ultrasound machines

These machines use the transmission and reflection of ultrasonic beams from blood flow to the uterine arteries, umbilical blood vessels or foetal heart to detect pregnancy. The waves are picked up and converted into a "whoosh, whoosh" sound. The machines are most accurate at around 28-30 days post-insemination. Noisy sheds, moving animals or sows that are being fed whey, can make pregnancy testing method very slow and exceptionally frustrating.

Real time ultrasound (RTU) scanners

Ultrasound scanners work by generating low-intensity, high frequency sound waves. The probe then picks these sound waves, as they reflect back off the tissue. Hard objects such as bone absorb few sound waves and echo most back, and are displayed as white objects. Soft tissue e.g. fluid filled objects (such as the bladder) echo few sound waves back and are displayed as black objects. The image is known as "real-time" ultrasound (RTU) because both the transmission and detection of sound waves is proceeding constantly with the resultant images being updated immediately (Belstra, 2000)

The portable RTU units in use in commercial piggeries either utilise sector transducers or probes or linear transducers. Linear transducers display a rectangular image and a wide-near field which is very useful when evaluating large ovarian follicles or pregnancy in bigger animals such as cows or mares. Basically for any RTU investigative situation where the object under consideration is within 4-8 cm of the skin surface would require a linear transducer.

Sector transducers display a pie- wedge shaped image, and a large far field (Figure 2). Scanning of sows for pregnancy diagnosis requires deep penetration and a large, far field, which explains the popularity of sector-style transducers in sow pregnancy diagnosis. The large, far field is advantageous in sow pregnancy diagnosis as it does not require that the scan be carried out directly over the developing foetuses (Nighswonger, L.N., 1999)

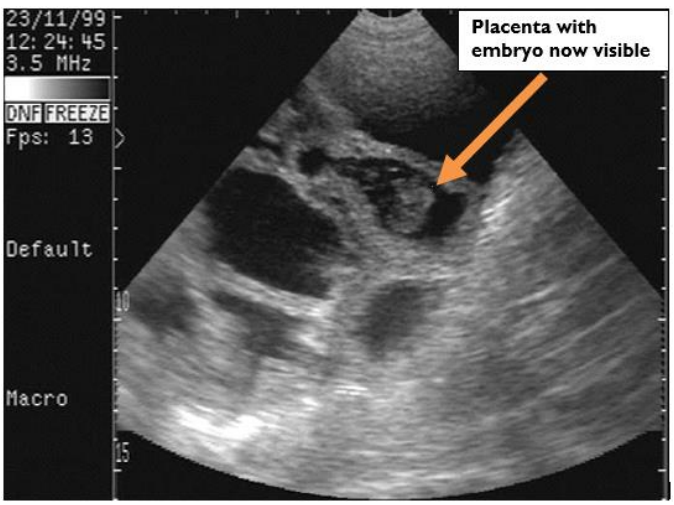

Figure 2. RTU image taken at 32 days post-insemination with a 50s Tringa RTU Scanner (PIE Medical)

Selection of transducer/probe frequency (measured in megahertz, MHz) is dependent on the level of tissue penetration required. The higher the frequency the less

deep you'll be able to scan but the greater the image quality (Table 1).

Table 1. Transducer frequency versus penetration depth and image resolution*

Probe Frequency (MHz)	Penetration Depth (cm)	Image Resolution
2.5	0-27	Ok
3.5	0-20	Good
5.0	0-12	Better
7.5	0-7	Best

** Adapted from Belstra, 2000*

With a real-time ultrasound it is possible to detect amniotic sacs ("bubbles", where the embryos develop) by 18-19 days and embryos can easily be detected by 25-28 days. However, the risk of an incorrect diagnosis is greater if the test is conducted around 21 days post-insemination. As with sow pregnancy diagnosis using the Döppler ultrasound, sows coming on or off heat can easily be mistaken for sows in the early stages of pregnancy, even with a flashy you-beaut, RTU unit.

In these early stages of pregnancy there is also the risk of incorrect results as the amniotic sacs may be hard to locate with some animals. Generally, the accuracy of the RTU scanners are quite high (93-98%) but the accuracy is reduced if the animals are tested before 22 days post-insemination (Belstra, 2000). Incorrect results with a RTU scanner are also possible after the 21day mark in gilts or sows that have cystic ovaries (Figure 3) or a uterine infection (Figure 4) (Martinet-Botte, F. et al., 1986)

Possibly the best system to reduce breeder herd non-productive-days (NPDs) is a management routine, which combines the use of an RTU as well as accurate heat & return detection.

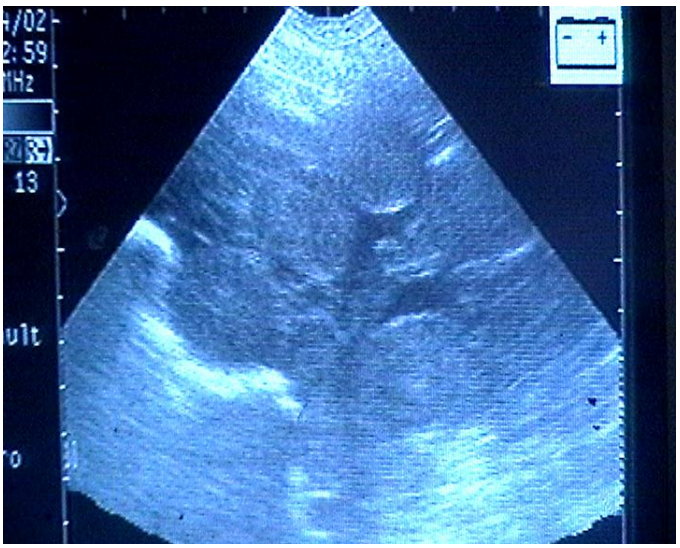

Figure 3. RTU image taken with a 50s Tringa RTU Scanner (PIE Medical) of a sow with pyometria (metritis-uterine infection)

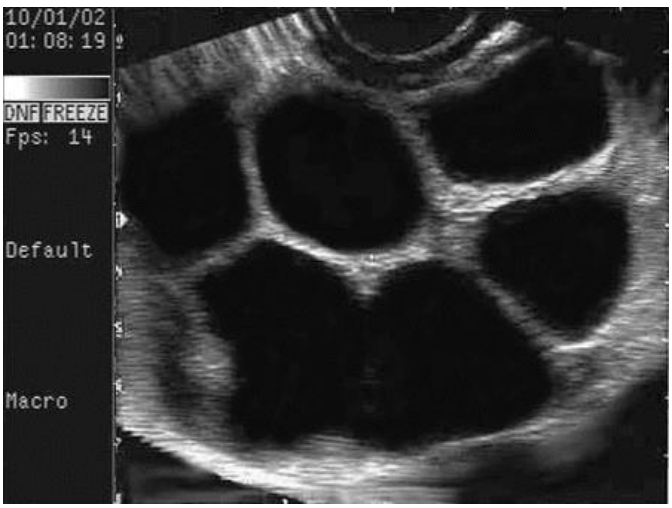

Figure 4. RTU image taken with a 50s Tringa RTU Scanner (PIE Medical) of a sow with cystic ovaries

Other applications:

Other applications for a RTU scanner include:

- Detection of false pregnancies in sows
- Detection of sows & gilts with "pyometria" (an infected fluid filled uterus, in what should have been the later stages of pregnancy

- Detection of retained piglets (I've always found this one very useful. Scanning a sow after you have performed a manual delivery or assisted birth, just lets you make sure that there are not any pigs left. Even when you can't feel any more, it's nice to know that there really isn't any more!!).