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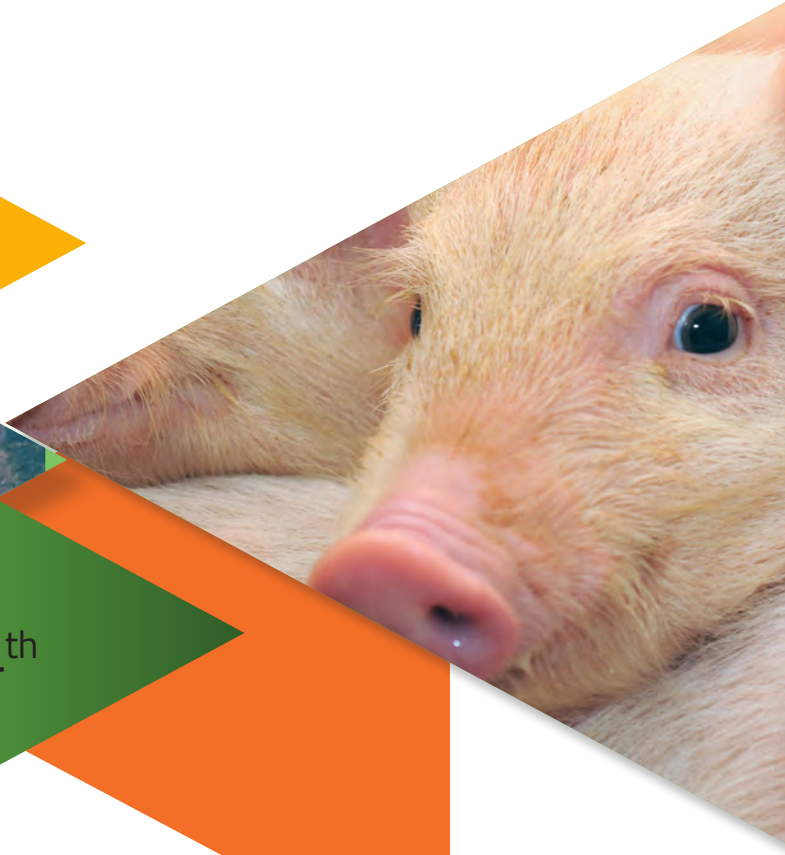

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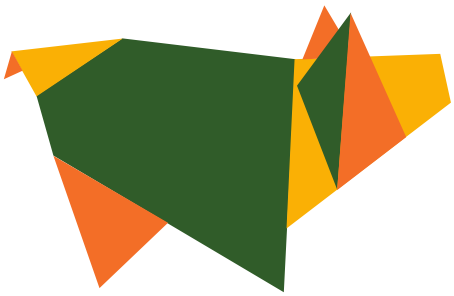

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# Diagnostic Approach to Common Reproductive Problems on Farms

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## Introduction

Problems associated with reproduction account for the majority of females being culled from herds worldwide. Reproduction is crucial to warrant profitability for wean-farrow sow farms and problems thus cause economical loses. Also, there is almost no farm that would not have "space" for improvement in reproduction (even though there aren't "problems"). Knowledge of available diagnostic tools and strategies are therefore crucial to reach/maintain reproduction targets or solve problems.

Common reproductive problems that the author has been encountered during his professional career include (in a non-prioritized order):

- Low conception rate
- Low farrowing rate
- "Early" fall-out
- Late fall-out
- Abortion
- High rate of returns
- Delayed puberty/High cull rate of gilts for "No Heat"
- Discharge/endometritis problem (puerperal = PDS & non-puerperal)
- Low litter size
- Long wean-estrus-interval

Any of these problems may have either a truly biological cause (i.e. sow and/or semen/boar failure; infectious or non-infectious), or is the result of management failure; the latter still being the number one reason for reproductive failures in females. Thus, any diagnostic work-up must include a careful management evaluation too.

When talking about "common reproductive problems" it means herd issues rather than individual problems. Each problem has its uniqueness, however, problems share similarities. "Diagnostic approach" always means to start a diagnostic work-up which depends on the case and comprises of joint but also specific diagnostic procedures. Identifying or verifying the problem based on a carful and comprehensive data record analysis has always to be the first step. This is not trivial as data entry differs between farms and is not always performed correctly. Once again, this record analysis will help to "narrow" the problem and "sharpen" the list of differentials. A farm-walk-through will follow and then a clinical examination of pigs that are specific to the problem (usually also involves pigs that are not affected as "controls"). The core element within the clinical examination may by ultrasonography by which the biological equivalent to the problem (but not necessarily the cause) can be identified. Other examinations may follow

(e.g., postmortem with microbiology, mycotoxicology, virology; housing, feeding, semen analysis etc.). As always, the "cost-benefit equation" needs to be considered. A few examples of common reproductive problems will be elaborated below (please refer to e.g., Björkman et al., 2019, Kauffold et al., 2019, Althouse et al., 2019, Baumann et al., 2021).

**Common reproductive problems**

If gilts or weaned sows are not in heat, stimulation protocols, heat check procedures and personnel doing heat checking have to be evaluated. For instance, boar stimulation has been shown to be occasionally weak. Examples are in gilts where boars were either of reduced libido or "bored" at stimulation or were inadequately heavy scaring the gilts. In weaned sows, common mistakes are related to the time, frequency or intensity of boar stimulation (e.g., starting too late post weaning or performed only once a day). Since the phenomenon of "No Heat" is essentially driven by sexual maturity and/or functionality of the ovaries, this can be effectively assessed by ultrasonography. The problem (e.g., gilt vs. sows; delayed vs. silent) derives the time and frequency when ultrasound has to be done. In gilts it would make sense to scan animals at different age groups e.g., at 180, 200 and 220 days of age to confirm the problem and assess the amplitude of prepubertal vs. pubertal animals. If the problem is evident, it has then to be further diagnosed e.g., by body condition scoring (which may include also back fat (BFT) and muscle thickness (MT) measurement by ultrasound). For instance, gilts at same ages but lower body weight as well as BFT and MT may display delayed or "No Heat" more frequently than better conditioned gilts. A case where gilts did not respond to an eCG treatment has been observed. In another case of gilts culled for "No Heat", an infectious cause has been suspected. In weaned sows with "No Heat", ultrasonography may be done at the time of projected breeding. Sows may have inactive ovaries (most often seen in primiparous sows with low body condition) or corpora lutea as a result of a lactational estrus (which turned out to be a common problem on German farms), but ovarian cysts are rather uncommon on a farm level. In the aforementioned situations, a postmortem examination of the genital tract is usually not required.

In cases of low conception or farrowing rate it is just logically to start the diagnostic work-up with controlling ovulation in order to determine when animals ovulate relative to breeding. A discrepancy of ovulation/breeding is one of the major reasons for low conception. However, if ovulation/breeding fits then checking for early embryonic losses by ultrasonography may follow. It is imperative to mention that, in the aforementioned cases, procedures used for pregnancy checking need to be carefully evaluated. While it is known that the return-to-service control (which is basically heat checking) is usually the least reliable procedure for pregnancy testing, ultrasonography can also fail. As an example, the author has been involved in cases of low conception/late term fall-outs where the person who did the scanning together with a poor ultrasound unit was identified as the source for the "failure" (i.e. open animals were misdiagnosed as pregnant and ended up as late fall-outs).

Low conception/farrowing rate with or without increased returns and occasionally also associated with vaginal discharge may, however, have other reasons. The time for sows while in lactation is crucial for the genital tract (especially the uterus) to involute. Involution is physiologically accomplished in the third week post farrowing. However, the process of involution can be negatively effected by e.g. high litter size, long parturition, hygiene failure, frequency of obstetrical interventions and many other factors. This may be associated with pathological puerperal vaginal discharge, which is, or is not accurately diagnosed by personnel, and thus may not be treated correctly (e.g. in terms of necessity and/or duration). As an effect, animals may not be cured when moved from lactation into breeding (i.e. may still have a "diseased" and maybe also bacteriologically positive uterus), and are thus highly susceptible to e.g. re- or superinfections (e.g. due to poor hygiene at breeding). Those animals are prone for conception failure, returns and eventually also the development of vaginal discharge. A careful audit of lactation is then always required, and ultrasound e.g. performed at breeding (see above) helpful to exclude ovulation/breeding failure. Also, animals that exhibited a lactation estrus and were bred in an estrus/ovulation synchronisation program

(diagnosed as animals having corpora lutea at breeding; as observed in one case) may develop vaginal discharge also because of progesterone dominance at breeding knowing of its immunosuppressive activity. While ultrasound may be beneficial to identify problem animals it does always help always help to unravel the causes for the problem. A good example is the mycotoxin DON that is, like progesterone, immunosuppressive. Laboratory results based on submissions of genital organs of animals with reproductive failures such as low conception, returns and vaginal discharged demonstrated that DON may be a major player for such phenomena. Animals that displayed critical concentrations of DON in bile had often signs of a mild-severe chronic inflammation of usually multiple genital organs (e.g. cervix, vagina, oviduct, uterus), and were also multiply bacteriologically positive in uteri. Newer results indicate that the regional lymph nodes supplying the genital organs may also serve as a good specimen for the diagnosis of especially viral genital pathogens.

## Conclusion

In conclusion, reproductive problems require a comprehensive diagnostic approach that depends on the specific problem. The same problem can have different causes. Understanding reproductive physiology is the bases of any diagnostic approach. Ultrasound is a very beneficial tool to pinpoint problems, but occasionally has to be complemented by additional examinations/analyses.

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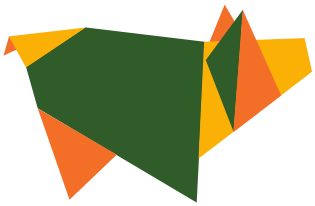

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