A COMPARISON OF OESTRONE SULPHATE AND PROGESTERONE ASSAYS FOR EARLY DETECTION OF PREGNANCY IN THE SOW

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Most methods for diagnosis of pregnancy in the sow (e.g. progesterone at 18 days (1), vaginal biopsy (2), rectal palpation (3,4), ultrasound (5) or PGF2α metabolite at 14 days (6)) are more than 90% accurate for detecting pregnant animals. Unfortunately, their accuracy is often significantly decreased in confidently determining which animals are not pregnant at the time of testing.

Oestrone sulphate is produced in the sow in detectable amounts only when embryos are present (7) and mainly between 17 and 32 days after mating. A plasma sample taken between 23 and 29 days after mating gives the most reliable results. The direct RIA for oestrone sulphate was developed by raising anti-sera against a structural mimic of oestrone sulphate (8).

Progesterone, on the other hand, is produced by the corpora lutea which are maintained by the presence of the embryos. However, progesterone can also be produced by corpora lutea or luteal tissue in the absence of viable embryos. Sampling at 18 to 24 days after mating gives the greatest differential between pregnant and non-pregnant animals.

Blood samples were collected from 385 sows and gilts in a commercial piggery between 18 and 29 days after mating. The farrowing rate to that mating was 79%.

Animals with plasma progesterone concentrations of 5 ng/ml or greater at 18 to 24 days after mating were regarded as pregnant, and those with lower values as non-pregnant. Sows with plasma oestrone sulphate levels of 0.3 ng/ml or greater at 23 to 29 days after mating were considered to be pregnant, and the others not pregnant. Of the 304 animals which farrowed, both oestrone sulphate and progesterone correctly diagnosed 302 (99.3%) as being pregnant (Table 1). But of the 81 sows which did not farrow to that mating, oestrone sulphate correctly selected only 53 (65.4%) and progesterone only 22 (27.2%) (Table 2). Of course some of the sows which did not farrow were pregnant at the time of testing, and then suffered embryonic loss or abortion.

As a test for the diagnosis of pregnancy, 91.5% of sows with oestrone sulphate values ≥ 0.3 ng/ml actually farrowed, compared with 83.7% of sows with progesterone levels ≥ 5 ng/ml (Table 3). For diagnosis of non-pregnancy, oestrone sulphate was 96.4% correct and progesterone 91.7% (Table 4). Thus oestrone sulphate is a more useful assay than progesterone for early pregnancy diagnosis in the sow and especially for early diagnosis of non-pregnancy. If the piggery manager can know which sows are not pregnant when tested at 23 to 29 days after mating then these can be returned to the breeding group or culled.

References

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TABLE 1. SOWS WHICH FARROWED (304)

	Progesterone →	0 - 4.9	≥ 5
E, S	0 - 0.29	0	2
	≥ 0.3	2	300

TABLE 2. SOWS WHICH DID NOT FARROW (81)

	Progesterone →	0 - 4.9	≥ 5	Total
E, S	0 - 0.29	22	31	53 (64.5%)
	≥ 0.3	0	28	
	Total	22 (27.2%)		

TABLE 3. DIAGNOSIS OF PREGNANCY

		Did Not Farrow	Farrowed	% F
Progesterone	≥ 5	59	302	83.7
E, S	≥ 0.3	28	302	91.5

TABLE 4. DIAGNOSIS OF NON-PREGNANCY

		Did Not Farrow	Farrowed	% DNF
Progesterone	0 - 4.9	22	2	91.7
E, S	0 - 0.29	53	2	96.4