The relation between oestrus signs and probability of ovulation at dubious oestrus in gilts

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Abstract

Urine samples of gilts were taken 10 to 12 days after a dubious oestrus. These samples were analysed for their pregnanediol content. The relation between oestrus signs and ovulation as indicated by the pregnanediol level was investigated. From a total of 680 gilts, 242 (36 %) showed a dubious first oestrus. As was indicated by the increased pregnanediol content of the urine 57 % of the dubious first oestruses was ovulatory.

Keywords: oestrus, ovulation, pregnanediol, reproduction, gilt

Introduction

Reproductive rate in pigs is important with regard to sow productivity. Age at puberty is one of the reproductive traits. A large variation exists in age at puberty (den Hartog & Noordewier, 1984). Determination of first oestrus in gilts is difficult because many gilts do not show clear signs of oestrus. Moreover it is questionable whether ovulation occurs at such an oestrus. After ovulation, corpora lutea develop and secrete pregesterone. Schomberg et al. (1965) showed a relationship between the pregesterone content in the blood and the amount of pregnanediol in the urine of the cycling sow. In the present study it was investigated whether ovulation at a dubious first oestrus in gilts can be predicted by the signs at that oestrus and those at the next oestrus and by the interval between those two oestruses.

Material and methods

The experiment was performed in 9 consecutive batches with a total of 680 Dutch

Landrace gilts. Oestrus detection started at the age of about 168 days and was done by visual inspection and with a vasectomized boar. At visual inspection, codes for the external appearance of the vulva were given (--: no signs of oestrus, E1: vulva slightly red and somewhat swollen, E2: vulva red and obviously swollen). This was combined with results of oestrus checking with the teaser boar (--: no signs of oestrus, T1: almost standing reflex, T2: standing reflex). Signs of oestrus ranged from no signs (-- --) via dubious oestrus (E1--, E2--, --T1, E1T1, E2T1) to oestrus (--T2, E1T2, E2T2). An oestrus with a standing reflex was assumed to be ovulatory while a dubious oestrus may or may not have been ovulatory. It was of interest to know whether a dubious first oestrus was ovulatory or not. Urine samples were taken 10 to 12 days after a dubious first oestrus and analysed upon their pregnanediol content. For this purpose the method of Leunissen & Thyssen (1978) was used after some modifications. The creatinine level of the urine was also determined because creatinine is less stable than pregnanediol. A high level of creatinine may indicate that pregnanediol is not decomposed.

Results and discussion

The determination of pregnanediol occurred by means of gas chromatography. The peak of pregnanediol was completely covered by an unknown compound with the same retention time. The concentration of this disturbing compound, equol, was

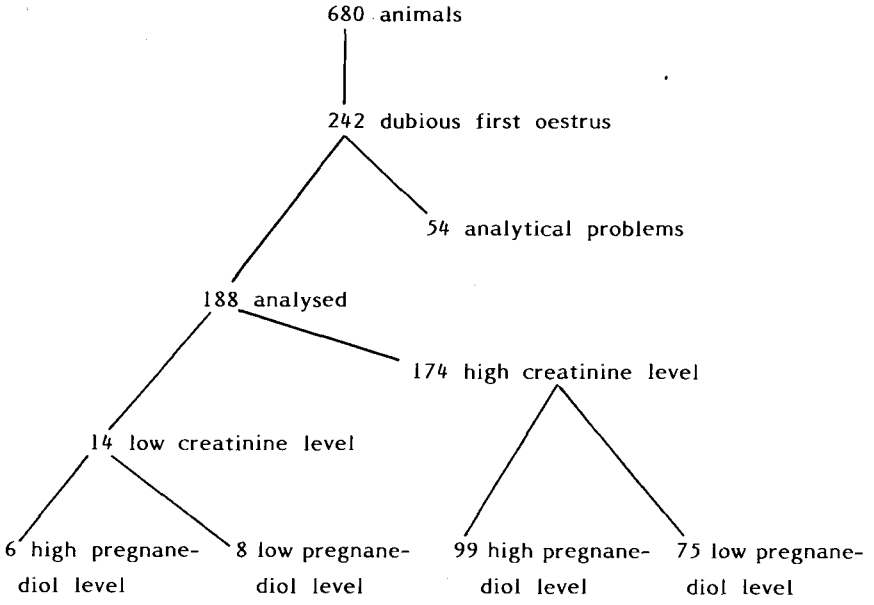

Fig. 1. Scheme of the number of samples that are used.

Table 1. Percentage of ovulatory first oestruses.

	Interval between first and second oestrus	
	irregular (<19 or >23d)	regular (19-23d)
First oestrus with signs less intense than E2T1		
Second oestrus:		
dubious signs (E2T1 or less)	26	37
clear signs (E2T2)	42	69
First oestrus with signs E2T1		
Second oestrus:		
dubious signs (E2T1 or less)	57	63
clear signs (E2T2)	57	94

E2T1: vulva red and obviously swollen and almost a standing reflex for the boar.

about 10 times higher. The separation succeeded by derivatization with both trimethylsilylimidazole and trifluoroaceticacidanhydride.

From a total of 680 gilts, 242 (36 %) showed a dubious first oestrus. Data of 188 of these gilts were analysed since data of the other 54 had to be rejected because of analytical problems. Fourteen of the 188 samples had a low creatinine level (less than 0.250 mg ml^{-1}). However, the level of pregnanediol in 6 of these 14 samples was high. In total 99, out of 174 (57 %) samples with a high creatinine level had a high pregnanediol level (4 times the basic level), which may indicate that 57 % of the dubious oestruses was ovulatory (see Figure 1).

Table 1 shows the percentage of ovulatory first oestruses in cases of a clear (E2T2) or dubious second oestrus followed after a regular (19-23 days) or irregular interval with the dubious first oestrus. The probability of ovulation at first dubious oestrus can be predicted by the oestrus signs at first oestrus in combination with the regularity of the interval between first and second oestrus and the oestrus signs at second oestrus. This probability varies from 26 % (very dubious first oestrus, irregular interval, dubious second oestrus) to 94 % (dubious first oestrus, regular interval, clear signs at second oestrus).

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