Acta vet. scand. 1980, *21*, 140—142.

Brief Communication

OESTRADIOL-17β CONCENTRATIONS IN THE PERIPHERAL PLASMA OF THE BLUE FOX (ALOPEX LAGOPUS) AROUND OESTRUS

The concentrations of oestradiol-17β in the peripheral plasma of 3 blue fox vixens, 2—4 years old, were studied during late prooestrus, oestrus and early gestation. The vixens came into heat between 12 and 18 April. Oestrus lasted for 3 or 4 days, and 2 of the vixens were mated once and 1 vixen was mated twice. All 3 vixens conceived as judged by laparotomy later on.

Blood samples were taken daily between 9 and 10 a.m. Duplicate determinations of oestradiol-17β of the plasma samples were performed by a radioimmunoassay technique described by *Sundsfjord & Aakvaag* (1972) with a few minor modifications. The sensitivity of the assay as read off the standard curves was 2 pg, equivalent to a plasma concentration of 5 pg/ml. The efficiency of extraction ranged from 73.8 to 80.4 %, and the oestradiol values given were corrected on this basis. The antiserum used in the present study has been shown to cross-react with oestrone to a degree of 11 % (*Lindberg et al.* 1974).

In all 3 vixens a well-defined oestradiol-17β peak, with maximal concentrations of about 200 pg/ml, was observed 1 to 3 days before onset of oestrus (Fig. 1). After the concentration of oestradiol had reached a maximum, a rather rapid decline was observed, and within 2 to 3 days the plasma concentrations reached preoestrous values of 30 to 50 pg/ml. Thus during the period of declining plasma concentrations of oestradiol-17β the first appearance of oestrous behaviour was noticed, and when the oestrus was beginning to disappear, the concentrations tended to be lower than those observed before the peak (Fig. 1).

Although the maximal concentrations of oestradiol-17β did not vary much between animals, it might be worthwhile to mention that the highest peak value, i.e. 225 pg/ml (Fig. 1b), was obtained from the vixen which had the largest number of whelps (14) in utero. Furthermore, in this vixen the plasma oestradiol was also above the preoestrus values for a period of 5 days compared with periods of 3 days in the other 2 vixens which later on bore 8 and 9 whelps.

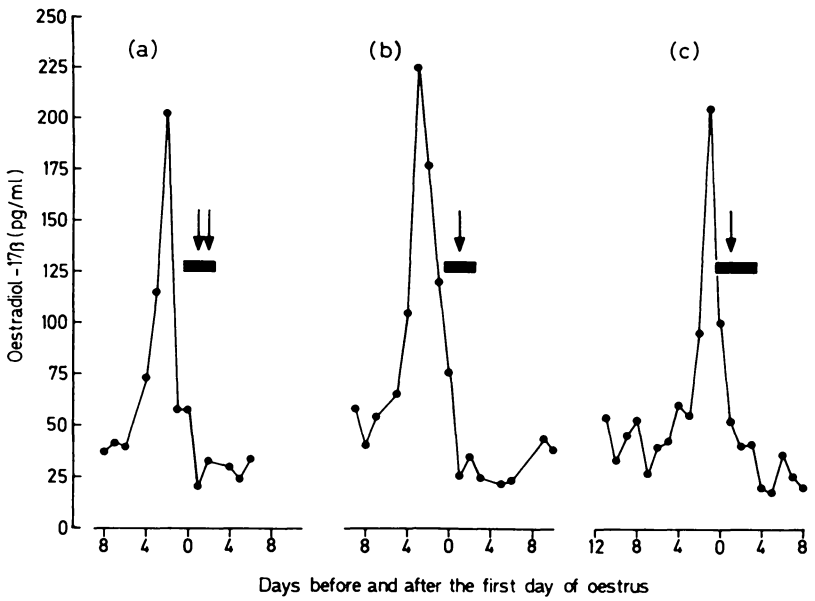

Figure 1. Plasma oestradiol-17β concentrations in 3 blue fox vixens during late prooestrus, oestrus and early gestation. The black horizontal bar indicates the period of copulatory behaviour as judged once a day on the basis of receptivity. The arrow marks the day when the vixen was mated.

The demonstration of an obvious oestradiol peak before the onset of oestrus, suggests that a rapid increase in plasma oestrogens is a prerequisite for induction of oestrus in blue fox vixens. However, the total requirements for induction of oestrus in blue fox are not clear. In this connection, it is interesting to note that the plasma progesterone concentrations in blue fox vixens increase at the onset of oestrus (*Møller* 1973, 1974). Based on the present results and the previous studies on plasma progesterone, it seems reasonable to predict an ability of progesterone to elicit copulatory behaviour in oestrogen-primed vixens. This speculation clearly warrants further investigation. Since the oestrogen peak probably induces an ovulating boom of LH even in the fox, measurements of LH should be included in further studies.

Acknowledgement. The authors wish to thank the Department of Medicine I, Royal Veterinary College, Stockholm, which provided the antiserum to oestradiol-17β-6 oxime bovine serum albumin.

O. M. Møller,
The Research Farm for Furbearing Animals,
Veterinary College of Norway, Oslo.

J. M. Aursjø and Ø. V. Sjaastad,
The Research Farm for Furbearing Animals and
the Department of Physiology,
Veterinary College of Norway, Oslo.

REFERENCES

Lindberg, B. S., P. Lindberg, K. Martinson & E. D. B. Johansson: Radioimmunological methods for the estimation of oestrone, oestradiol-17β and oestriol in pregnancy plasma. Acta obstet. gynec. scand. Suppl. 1974, *32*, 5—19.

Møller, O. M.: Progesterone concentrations in the peripheral plasma of the blue fox (Alopex lagopus) during pregnancy and the oestrous cycle. J. Endocr. 1973, *59*, 429—438.

Møller, O. M.: Effects of ovariectomy on the plasma progesterone and maintenance of gestation in the blue fox, Alopex lagopus. J. Reprod. Fertil. 1974, *37*, 141—143.

Sundsfjord, J. A. & A. Aakvaag: Plasma renin activity, plasma renin substrate and urinary aldosterone excretion in the menstrual cycle in relation to the concentration of progesterone and oestrogens in the plasma. Acta endocr. (Kbh.) 1972, *71*, 519—529.

(Received February 1, 1980).

Reprints may be requested from: O. M. Møller, the Research Farm for Furbearing Animals, 1380 Heggedal, Norway.