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BLOWHOLE HORMONAL ANALYSIS: A NEW APPROACH TO THE STUDY OF TURSIOPS TRUNCATUS PREGNANCY?

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INTRODUCTION Hormones and behaviour are reciprocally influenced. Monitoring hormones levels can therefore provide insights into the mechanistic aspects of behaviour. Hormones are usually extracted from blood samples or saliva, urine and faeces. In cetaceans, an alternative source may be found in blowhole samples, which can be collected non-invasively.
Given the current scientific knowledge on pregnancy endocrinology in dolphins, specific aims of this trail were a) to set up and validate progesterone (P4) and cortisol determination procedures from blowhole samples and b) to determine the concentration and profile of progesterone and cortisol during *Tursiops truncatus* pregnancy.

MATERIAL AND METHODS The study was conducted in the Rimini Delfinario (Italy) on a female monitored from July to September 2003 during the last three months of gestation. The observations were made once a week until the final week before delivery when samples were taken on three alternative days. The bottlenose dolphin was trained to blow into polypropylene sterile bottles with a screw closure. The samples were stored at –20°C until assayed. Concentrations of steroid hormones were determined by validated radioimmunoassays (Seren *et al.*, 1974; Tamanini *et al.*, 1983).

RESULTS AND DISCUSSION Progesterone concentrations during the last 12 weeks of gestation always remained high and didn't change throughout the observed period. However, during the final week progesterone values gradually decreased as the birth date approached and continued to fall until reaching the minimum 40 days after the event. As for cortisol, its concentrations were low until 10 days before the delivery when, as expected, they started to dramatically rise until reaching the maximum the day before the birth.
In conclusion, since these results are analogous to those obtained from blood serum and milk in the same species and in other mammals under similar physiological conditions, blowhole samples could represent a suitable biological material in order to detect and quantify by RIA progesterone and cortisol levels during pregnancy. At the same time, the sampling method is easy to be applied and absolutely non-invasive for the animals.

REFERENCES
Seren E., Leopold A., Bolelli G. (1974) Peripheral plasma levels of oestrogens and progesterone during the bovine oestrous cycle, *Arch. Vet.* It. 25, 1-20.
Tamanini C., Giordano N., Chiesa F., Seren E. (1983) Plasma cortisol variations induced in the stallion by mating, *Acta Endocrinologica* 102(3), 447-450.