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ETHOLOGY(WINTER SYMPOSIUM, CAMBRIDGE,
10 DECEMBER 1969)**Perinatal Behaviour in the Thoroughbred Horse***By P. D. Rossdale, Newmarket*

The three stages of labour are recognizable in the mare. Stage I is accompanied by restlessness and sweating. Stage II usually occurs in recumbency, although interference by attendants may modify the pattern; delivery should be completed within one hour if it is to be normal. During much of the time, arterial pO_2 in the foal is low, but oxygen levels rise rapidly when breathing starts. Generally the cord is broken when the mare stands, or as the foal struggles to its feet. Sucking usually commences within two hours. Early searching patterns are directed to darkened hollows, including the groin of the mare; when the mare is restless the area of interest may extend to other regions. Most frequently the mare positions herself in front of and facing the foal so that the advance of the foal leads logically to the mammary area.

A practical method of artificially rearing foals is with a bottle and teat, using substitute or mare's milk. Alternately a foal may be taught to drink from a bowl or the manger. Fostering to another mare is usually possible if the foal is covered with the amnion or skin of the foster-mother's own offspring, and is most successful if the dam has suckled her own young first. Records show that goats or cows may also be employed as foster-mothers. If the suck-reflex is absent it is necessary to administer food through a stomach tube.

Maladjustment is frequently associated with low blood oxygen tensions and metabolic acidosis; it is marked by inability to suck, hypersensitivity, hypothermia (and in some cases hyperthermia), dyspnoea and the utterance of expiratory sounds which may simulate a dog barking or panic whinnying. Where behavioural patterns are disturbed the term "maladjustment syndrome" is preferred to those of "barker", "wanderer", "Dummy".

These states are usually associated with pre-, intra- or postnatal asphyxia and with neurological damage signified by an exaggerated extensor tone, notable signs being opisthotonos and extensor rigidity of the hind limbs and tail. Premature foals are also maladjusted, but do not usually lose the suck-reflex, so that although weak, sucking is possible if they are assisted. Reactions to the environment may appear displaced, for example if straw is held to the mouth, the jaw may be opened.

Some Observations on Equine Oestrus*By A. F. Fraser, Edinburgh University*

The salient behavioural features of equine oestrus have been recognized by

man over centuries and it is possible that some of the prehistoric cave drawings depict mares in oestrus. There still remains the need to improve our recognition of some of the minor behavioural features of oestrous so that the physiological state of the breeding mare can be appreciated.

Apart from temporal aspects of oestrous behaviour surprisingly little is known about the modification of oestrous manifestations among mares. In a study of courtship activities in the horse four phases in pre-coital activities have been recognized. These are as follows:

1. Greeting—this includes nosing and face-nipping.
2. Active interchange—this includes biting, vocalizations.
3. Oestrous display—this includes a well-recognized range of female activities such as posturing, tail arching, clitoris flashing and mucus ejection.
4. Passivity—this includes orientation towards the male subject.

Deviations from the norm occur and these appear to be more common at either end of the breeding season. They consist mainly of fractiousness in association with oestrus and with incomplete oestrous displays.

In comparing levels of fertility in horses in domestication and in the wild state it appears that reduced productivity is characteristic under domestication. This may be related to the fact that man's appreciation of equine oestrous behaviour has not shown improvement over centuries. Apart from photo periodicity, exteroceptive stimuli in quantity are customarily denied the breeding mare and further ethological and physiological studies might show that extended courtship activities can improve the fertility of the mare.

Social and Sexual Behaviour in the Red Deer Stag

By R. V. Short, Veterinary School, Cambridge University

(See HB, 12, 797 - Lincoln)

Seasonally-breeding animals might be expected to show closer relationships between behavioural and humoral patterns than domestic species, and it is possible that sexual behaviour could be differentiated from social behaviour. The island of Rum has a population of about 1500 red deer on 25,000 acres; 60 stags were trapped and marked with ear-tags, plastic streamers or radio-telemetry transmitters.

As testosterone levels rise during early August, there is spasm of the blood vessels to the velvet antler, which is converted to hard horn. Falls in blood testosterone in late March lead to casting of the antlers, so that blood hormone levels can be estimated by direct inspection of the animal from a distance.

For 9 months stags live in a bachelor community, with a very pronounced social hierarchy established by fights—once established, the hierarchy remains intact for the season. When stags are in hard-horn, the antlers are a weapon of defence and offence, but when in soft-horn conflicts are settled by standing up "boxing contests" so that a complete change in the social hierarchy occurs about April time. Older stags lose their antlers first, and thus offer a "boxing" threat to contenders; because the defendant must always adopt the method of combat offered by the challenger, older stags thus have an advantage and

may become dominant again. Then the nutritional plane is at its lowest (April/May), and a normally dominant stag may become subordinate because it is in velvet.

When the antlers are removed, the position of the stag in the hierarchy drops, indicating that antler size rather than blood hormone levels are of greatest importance, although attaching larger antlers make little difference, except that the stag may no longer be recognized. Removing the points of an antler also make little difference socially, and the stag may be successful during the rut by relying on lateral display rather than head-on encounters—that is, a big body profile can be advantageous.

Castration lowers blood testosterone levels, so that the antlers are cast, but re-grow in velvet form and with an odd shape; libido disappears. If a testosterone implant (1 g. subcutaneously) is then given, rut is entered within 2 weeks, hard-horn antlers develop, the position in the hierarchy rises, and rutting activity commences, in spite of the hinds being out of oestrus.

Observations on the Fostering of Calves for Multiple Suckling Systems

By J. P. Crowley and T. E. Darby, An Foras Taluntais, Grange, Dunsany, Co. Meath, Ireland

In a series of observations dealing with the fostering of calves, most Friesian heifers which were deprived of both the sight and smell of their own calves refused to accept a foster calf presented to them within a few hours of calving. In subsequent studies it proved beneficial to allow the heifer to nurse her own calf for 3–4 days after calving. In substituting two foster calves or in adding an additional calf at this time, the results showed that both visual and olfactory cues were concerned in the process whereby the heifer distinguished her own from other calves. The application of oily materials both to the calves and the muzzle of the dam appeared to impair the olfactory process; blind-folding the dam for a short period also improved the success rate

Some Observations on an Orphan Foal

By J. E. Cox, Royal Veterinary College, London University

This foal was born within its allantoic membranes following several vaginal examinations of the dam. Suckling was strongly resented, the mare squealing and tensing her abdominal muscles; accordingly, the foal was removed and hand-reared on half-hourly feeds of 140 ml. aliquots of a mixture of 3 parts Jersey milk to 1 part water, containing 50 g./l. glucose. By 5 months the foal drank 3.5 l. twice daily, and was then introduced to grass and hay, with dairy nuts. A companion foal was also introduced, but was removed at 2 months of age. The orphan pined after removal of the other foal, and resented the introductions of a further foal.

At night the orphan was kept indoors, but during the day it ran with cattle and developed close attachments to the attendant. When the orphan was introduced to the mares, only the mother showed any interest; other foals

became very interested in the attendant, much to the distress of the orphan, which seemed at this time to be rejecting other horses as companions, and was showing bouts of bad temper and unpredictable behaviour.

By the time weaning was carried out, in early November, behaviour was more like that of a normal orphan foal. The companionship of four other female foals was rejected at first, but by the spring acceptance had begun. When 9 months old the orphan was being turned out by day, and brought in at night but later it stayed outdoors at night, and has lived with the others since.

At 15 months she was tested for oestrus alongside a stallion and reacted normally. The orphan is now pregnant, accepts experimental bleeding and other forms of manipulation, and appears to be quite normal.

Some Aspects of the Behaviour of Stallions with Mares

By F. L. M. Dawson, M.A.F.F., Cambridge

The literature on the management of stallions includes claims made that use of entires for riding and harness purposes may adversely influence their sexual activity. On the other hand there is a measure of agreement that a regime of close confinement associated with use only for service increases the risk that an entire may become dangerous to handle. There is, however, controversy as to how safe stallions may be for saddle and harness use in the company of other horses.

Experiences were described involving the use of three stallions over prolonged periods for general purposes as well as for service. A film, made with the support of UFAW, showed normal sexual behaviour by a 10-year-old thoroughbred stallion, succeeded by his use: for bareback riding in close association with an oestrous mare; in harness; and for riding by children along with mares and geldings. Similar results were obtained with the two other stallions.

Observations on the Behaviour of a Group of Artificially Reared Lambs

By D. B. Stephens and B. A. Baldwin, A.R.C. Institute of Animal Physiology, Babraham, Cambridge

Observations have been made on a group of lambs born and reared indoors in a commercially operated intensive sheep husbandry unit. Breeding ewes were kept in groups of 25 to 35 in an area of 9.1 m. × 4.6 m. Wood shavings were used as bedding and the ewes were fed a proprietary concentrated ration together with hay. Parturition, which normally occurred in the group pen, was observed in 8 cases. Near term ewes displayed a swollen udder with taut shiny skin and imminent parturition was indicated by a period of restlessness with movement throughout the pen. To give birth the ewes always lay down near a wall in one corner and parturition was completed within thirty minutes. Birthweights varied from 3.25 to 4.50 kg.; other ewes in the pen usually displayed an intense interest in the new-born lambs and frequently sniffed and licked them.

Ewes and newborn lambs were removed from the group a few minutes after birth and placed in individual pens for a period of 48 hours so that the lambs could suckle colostrum. Detailed observations were kept on the suckling behaviour during this period. At the end of this 48-hour-period all lambs were removed from the ewes and placed in groups of 6 to 12 in special lamb rearing pens measuring 6.1 m. \times 6.1 m. with wood shavings on the floor. Cold milk substitute, freshly prepared, was available *ad lib.* from a central cylindrical reservoir which delivered the milk to 12-14 soft horizontally protruding rubber teats arranged concentrically at a height of 34 cm. Initially most lambs had to be guided to a teat, but normally were able to find a teat and self-feed after the first 24-hour-period. In addition to general observations on the group detailed records were kept of the activities of three lambs from birth to weaning on to solid food at 5 to 8 weeks old. An attempt was made to quantify some of the components of their ingestive behaviour. When necessary, direct observation was supplemented by means of closed circuit TV apparatus with videotape recording to facilitate analysis.

Although the majority of lambs gained weight efficiently and were in good health, certain lambs spent a considerable time suckling the scrotum or occasionally the navel, or ears of other lambs. This activity frequently resulted in disruption of feeding in the suckled lamb and suckling in the inguinal region often led to ingestion of faeces and subsequent scouring in the suckling lamb.

The Effect of Certain Drugs on Appetite

By J. G. Bainbridge, I.C.I., Cheshire

The appetite of rats was measured by the following methods:

- (a) the rate of lever pressing which was rewarded by food in the skinner box;
- (b) the time taken to begin eating when placed in a novel environment where food was available. Some 50 per cent of hungry rats refused to eat in this situation within 10 minutes. The remainder were used for the studies on drugs;
- (c) the amount of food eaten by rats accustomed to a 2-hour daily feeding routine. Some fed in groups and some in isolation.

The results showed that the so-called minor tranquilizers (chlordiazepoxide, phenobarbitone and meprobamate) increased appetite in all the above test situations except in the grouped animals of method *c*. Neuroleptics (chlorpromazine and haloperidol) decreased appetite by all methods.

It was suggested in the discussion that the above central nervous system depressants interfere with the hypothalamic feeding mechanisms. The failure of the minor tranquilizers to enhance appetite in the grouped animals is of some interest from the ethological point of view.

REFERENCE

BAINBRIDGE, J. G. (1968). *Psychopharmacologia*, **12**, 204.

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