

THE IMPORTANCE OF ANIMAL BEHAVIOURAL STUDIES FOR MODERN ANIMAL HUSBANDRY

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INTRODUCTION

The dramatic increases in animal productivity in recent decades, particularly in the developed world, owe a great deal to the genetic improvement which has taken place in the different species.

In non-stressful environments different breeds of cattle rank for productivity according to their genetic potential. In the presence of environmental stresses such as heat, parasitic and other diseases, and fluctuations in the quantity and quality of nutrition, the rank order for productivity is related to the level of resistance that each breed possesses to the stresses that are operating (Vercoe and Frisch, 1983).

The technical surroundings change vigorously and significantly. Basic types of behavioural forms of domestic animals and their rhythms changed hardly. In the modern husbandry, animals are forced to adapt themselves into two directions. They should adapt to group mates and to effects of the group on the one hand to techniques on the other, which were designed primarily on basis of requirement of organization of labour.

Animal scientists have come to realize that there are many ways in which ethology can help with the welfare of animals and thereby insure more profit from more sensible husbandry. For example, comparative studies on feral animals help to throw light on the behaviour patterns of domesticated species. Studies of this kind have been helpful in clarifying the importance, in the lives of modern farm animals, of such environmental factors as social companionship, regular feeding and resting regimens and rhythms of other activities such as sleeping and breeding.

Under intensively housed conditions man controls most of the factors influencing productive and reproductive performances, such as the amount of food available, hygiene level of the herd. Nevertheless, even under these conditions some factors can influence productive and reproductive performances of the animals, such as social behaviour (in free stalls), sexual behaviour, maternal behaviour and/or daily activities.

The topic of this paper will primarily focus on our experimental results on the behaviour of cattle, buffalo, sheep, and camels under given ecological and economic conditions.

Some behavioural aspects in cattle herds

The investigated behavioural patterns (approaching, threatening, butting, pushing aside, mounting) of the cattle was in most cases dependent on the rank position of the

animals (El-Kaschab, 1979). Only within the groups of older animals a linear rank order could be observed, whereas in younger animals a triangular relationship prevailed. In almost all animal groups of this trial a positive and highly significant correlation could be found between rank position, age, body weight and body measurements. In commercial breeding the surface available per animal is reduced and food is concentrated in a limited area. In this situation, the environment can affect production as a consequence of the social organization of the herd, as when subordinate animals undergo a reduction of feeding time. Bouissou (1964) reported that the adrenal weight increases in low ranking individuals as a consequence of social stress. A better knowledge of the mechanism regulating the social structure of the herd is an essential prerequisite to the elaboration of modern management techniques.

Some behavioural aspects in buffalo herds

El Kaschab *et al.* (1991) reported that, drinking behaviour constituted about 0.04% of the daily activities of the Buffalo cows. The average daily amount of water drunk, time spent drinking and drinking frequency were 47.9 ± 1.7 kg, 6.0 ± 0.1 min., and 13 ± 0.3 , respectively. Kind of roughage exerted a highly significant effect on the amount of water drunk. The flow rate of water to troughs and bowls should be adequate, with sufficient space for drinking.

The average daily faeces output and number of defecation were 33.8 ± 0.4 kg and 8.7 ± 0.1 times, respectively, about 88% of the defaecations are carried out in standing position and the rest of 12%, while lying. The effect of kind of roughage and class of parity and milk yield level on elimination behaviour were highly significant. Reproductive state had a highly significant effect on frequency of defecation (El Kaschab *et al.* 1991). This results will be of great help in the design of barns.

Concerning milking behaviour, the average let down time, milking time and milk flow rate were 5.11 ± 0.05 min., 7.34 ± 0.03 min. and 451.2 ± 1.79 g/min., respectively. The effect of class of parity, milk yield level and seasons of milking had a significant effect on the milking time and milk flow rate.

The inability to detect oestrus reliably and consistently remains a major problem in Egyptian buffalo herds. In this aspect, oestrus was observed by some external signs e.g. frequency of sniffing of vulva and mounting by the bull, bellowing, tail raising, response to placing the hand on rump and to light massage of vulval lips (Omar, 1988). The reliability of observed signs were proved by concentration of progesterone in milk fat. The teaser bull recognized about 82% of the buffalo cows in oestrus. Bellowing, hyperemia of vulval mucous membrane, response to placing of hand on rump, response to slight massage of vulval lips, tail raising, and teat-tightness were exhibited coincidentally in 65%, 76%, 76%, 65%, and 88% respectively.

On the other hand, there were significant changes in daily milk yield during oestrous cycle. There was a decline (-1.32 kg) in mean milk yield on the day of oestrus, but this was accompanied by a significant increase (1.49 kg) in mean milk yield on the following oestrus.

An understanding of the behavioural patterns exercised by animals under intensively housed conditions crucial to the development of successful husbandry practices.

Traditional criteria of oestrus detection in relation to progesterone test (Omar, 1988)

Criteria of oestrus detection	No. of observations	reliability in %
Progesterone test	17	100
Frequent sniffing of vulva and Mounting by bull	14	82
Bellowing	11	65
Hyperemia of vulva mucous membrane	13	76
Response to placing of hand on rump	13	76
Response to slight massage of vulval lips	11	65
Tail raising	11	65
Teat-tightness	15	88

Some behavioural aspects in sheep herds

Concerning dominance and mating behaviour of rams under paddock conditions, the highest ranking ram had more mounting encounters and was more aggressive than the subordinate rams. This activity disturbed his ejaculatory mechanism and sometimes resulted in the absence of ejaculation or energetic ejaculation. In the four-sire breeding pens the dominant ram often found it impossible to completely curtail the sexual activity of the subordinating rams. He made 70.9% and 49.0% of the total number of mounts in the three-sire and four-sire breeding pens, respectively. The highest ranking ram claimed most estrous ewes for his "harem". The subordinate rams only had an opportunity to mate when several ewes simultaneously in estrus (El Kaschab and Kallweit, 1987). When groups of rams are to be used together in a herd mating system, uniform animal groups and adequate space will give the most satisfactory mating performance. It is recommended to try several rams before breeding season. Such high ranking rams "boss" may cause a delay in the lambing season.

El Kaschab *et al.* (1996) reported that maternal behaviour is the most essential events affecting survival of lamb such as care-giving and suckling. The relationship between the ewe and her neonate starts before lambing and continued till weaning time. Variation of maternal behaviour of pre, during and post-lambing period is related to differences between breeds, litter size, parity, weight of ewes and lambs, season of lambing and surrounding environmental factors. It is advisable to prepare individual lambing pens especially for local ewes to establish the mother-young bond.

The post-lambing maternal behaviour depends on various factors. However, the birth weight of lamb constitutes the most important one, beside lambing experience of the ewe. Normal behaviour was more frequent among older ewes and the heavier ones.

Poor vigour of lambs and acceptance interference are the main causes of post-lambing abnormal maternal behaviour. To avoid the high mortality rate observed during the first week post-lambing, it should be given more observation and care to ewes with abnormal behaviour.

These results highlighted the importance of normal maternal and neonatal behavioural patterns for the lamb survival rate particularly in breeds which are characterized by high percentage of twinning.

Some behavioural aspects in Camels

Few attempts have been made to study behavioural activities of camels. The last two decades also saw an increased scientific interest in all matters pertaining utilization and management of arid lands and with it a substantial number of scientific publications on the camel. According to Wilson (1989) most of the publications covered diseases and veterinary aspects (34%), anatomy and morphology (16%), general physiology (12%) and reproductive physiology (10%). Studies on feeding and nutrition, productivity, production systems, camel management and behavioural aspects are very rare.

El Kaschab *et al.* (1993) studied the pre-and post-partum behaviour in the dromedary camel. The calf started the first suckling after 14.5 hr. Frequency of suckling during the next 4 following days were 8,9,24 and 21, while duration of suckling were 3.9,2.1,5.0 and 6.1 min., respectively. Suckling were distributed relatively throughout the 24 hours.

The problem of camel slaughter house in " Mena, Saudi Arabia " could be discussed.

It is first of importance to note that animals are not simply passive reactors to an ever changing external world. They can indeed behave independently of their surrounding environment. They perform motor activities even in the absence of external stimulation.

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