

**COMMON FACTORS AMONG HORSES PERFORMING  
STEREOTYPIES****M. J. Kennedy****Summary**

The research reported on here is an attempt to identify common characteristics and management factors among horses performing stereotypies. If such factors can be identified, this knowledge could be used in order to improve the environment domestic horses experience, subjecting them to less stress and improving their welfare.

*Introduction*

Stereotypies have been defined as repeated, relatively invariant sequences of movements which have no obvious function (Broom and Johnson, 1993). It is thought that they represent an attempt to cope with stress resulting from some deficiency in the environment. These attempts to cope are known as coping strategies, and their use indicates that some factor of the animal's environment is stressful, and that its welfare is poor.

Stereotypies are active coping strategies, involving the active performance of behaviour in attempting to cope with the environment. Passive coping strategies do not involve active behaviour, but still indicate that the animal is attempting to cope with a deficient environment. Withdrawal, when the animal becomes very inactive and unresponsive to factors in its environment, is an example of a passive coping strategy.

Crib-biting and wind-sucking are examples of stereotypies performed by horses. These behaviours are sometimes referred to within the equestrian community as "stable vices". This implies that stereotypy performance is due to some moral fault of the horse, rather than an attempt to cope with an unsuitable environment imposed upon it by human management. The term "stable vice" is therefore highly inappropriate and should not be used.

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### *Methods*

49 Horses (23 geldings and 26 mares) were studied at 6 stables. 2 of these were riding schools (stables A and B) and 4 were private yards (stables C, D, E and F). Before behavioural observation commenced, data was collected on the characteristics of the horses (Table 1) and on the management routine of the stable (Table 2).

Table 1. - HORSE CHARACTERISTICS

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Breed: By observation. Scale 1 to 10; i.e. 1=Cold-blooded, draught/native pony type, 10=Warm-blooded Thoroughbred/Arab type.  
Sex: By observation. Gelding or mare (no stallions at stables studied).  
Age: Interview with stable staff.  
Temperament: Assessment by stable staff.

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Table 2. - MANAGEMENT FACTORS

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Amount horses worked: Interview with stable staff.  
Length of turnout: Interview with stable staff.  
Length of time horses had access to hay: Interview with stable staff.  
No. of horses each individual could see: By observation.  
Degree of confinement (i.e. how enclosed housing was; e.g. did loosebox have solid walls or bars etc.): By observation.  
Activity level of yard: By observation.

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Having collected this data, the horses were observed from an unobtrusive position for 3 hours (this position was taken up 30 minutes before hand to allow the horses to become habituated to the observer's presence). All instances of behaviour conforming to Broom and Johnson's definition of stereotypy above were recorded.

### *Results*

Of the 49 horses studied, 9 performed stereotypies during observation (Fig. 1). This gives an incidence figure for stereotypy in this population of 18.37%.

There was no significant difference in incidence of stereotypes between the sexes (Fig. 2). Data for both sexes were therefore pooled in further analysis.

Figure 1. - PROPORTION OF STUDY HORSES PERFORMING STEREOTYPES

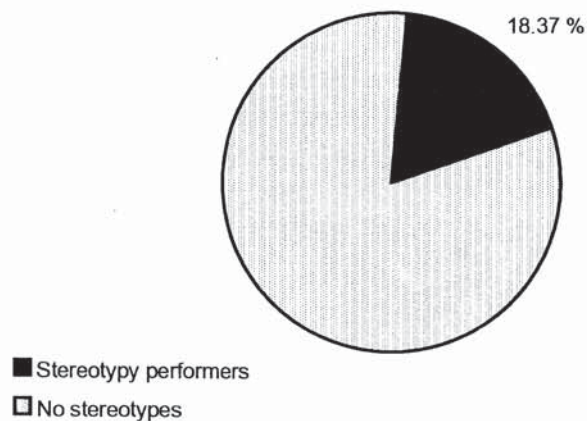
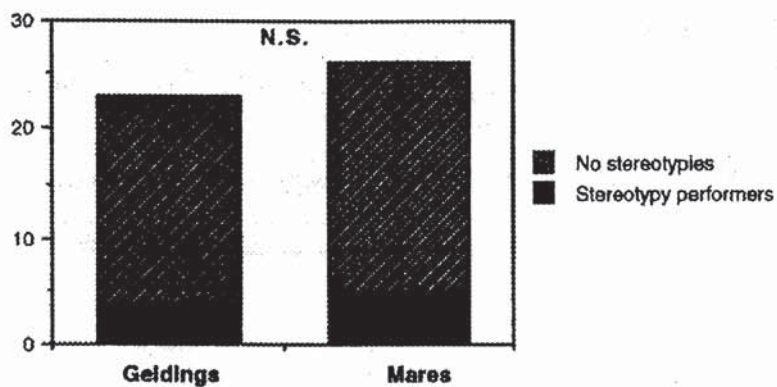


Figure 2. - SEX AND STEREOTYPY INCIDENCE (CHI SQUARE TEST)



There were differences in stereotypy incidence between stables. Stables A, B, C and D had stereotypers present, whereas stables E and F had none (Table 3).

Data was then analysed to identify any differences in horse character or management variables between stables which might account for differences in stereotypy incidence between stables. Those which differed significantly between stables are listed in Table 3.

Table 3. - STEREOTYPY INCIDENCE IN STABLES STUDIED

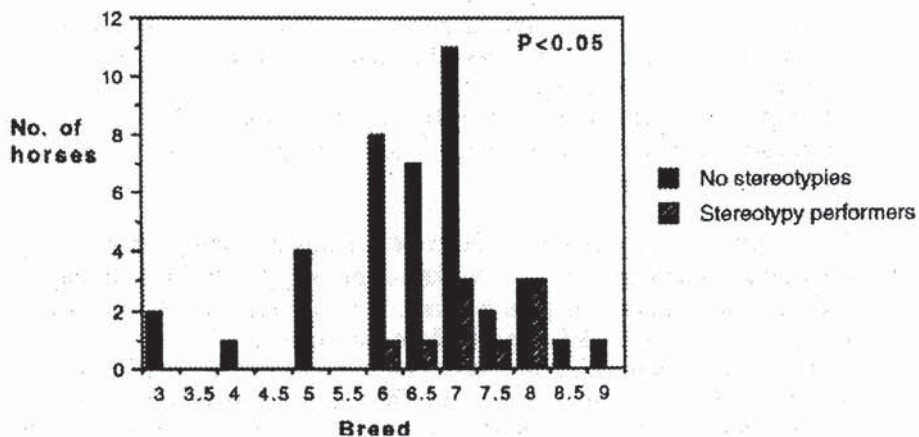
Total	Stereotypy performers	No Stereotypies	
Stable A (Riding school)	3	7	10
Stable B (Riding school)	2	8	10
Stable C (Private yard)	2	6	8
Stable D (Private yard)	2	4	6
Stable E (Private yard)	0	11	11
Stable F (Private yard)	0	4	4

Table 4. - HORSE AND MANAGEMENT FACTORS VARYING BETWEEN STABLES (KRUSKAL-WALLIS ONE-WAY ANOVA)

Factor	Significance
Breed of horses kept	P<0.05
Amount horses worked	P<0.01
Length of turnout	P<0.01
Length of time horses had access to hay	P<0.05
No. of horses each individual could see	P<0.01
Degree of confinement	P<0.01
Activity level of yard	P<0.01

When these factors were related to stereotypy, breed was found to be significantly related to stereotypy incidence. Horses of the warm-blooded, Thoroughbred/Arab type had a greater tendency to be stereotypers than cold-blooded, draught/native pony types (Figure 3).

Figure 3. - BREED AND STEREOTYPY PERFORMANCE (MANN-WHITNEY U-TEST)



Finally, discriminant analysis was performed in order to identify those horse character and management factors which were the best predictors of stereotypy performance in order to further investigate non-significant trends in variables other than breed relating them to stereotypy. This analysis also tests the performance of the variables chosen in predicting stereotypy and thus aids in validating the experimental method used.

The best predictor of a horse as a stereotypy performer or not was breed, followed in descending order by the number of horses it could see, the length of time it had access to hay and the amount it worked. This method's overall accuracy of prediction using all measured variables;

- Predicts stereotypy performers correctly in 89% of cases
- Predicts no stereotypies correctly in 72.5% of cases
- Overall accuracy of prediction as stereotypy performer or not; correct in 75% of cases

### *Conclusions*

Horses of the warm-blooded (i.e. Thoroughbred/Arab) type were more likely to be stereotypy performers than horses of the cold-blooded (i.e. draught/native pony type). Warm-blooded horses tend to be more reactive than cold-blooded horses; they are more likely to react to environmental stimuli with active behaviour. For example, warm-blooded horses are more likely to bolt at sudden movements than cold-blooded horses. It may be the case that this pre-disposes warm-blooded horses to reacting to environmental deficiencies with active coping strategies, such as stereotypies. Conversely, cold-blooded horses may be predisposed to reacting to such difficulties with passive coping responses, such as becoming inactive and unresponsive to environmental stimuli.

It is therefore important to consider both kinds of coping response when attempting to assess a horse's welfare. Stereotypy performance may indicate that a horse has poor welfare, as it is using this behaviour in an attempt to cope with deficiencies in its environment. This does not mean that a horse experiencing the same environment but not performing stereotypies necessarily has good welfare; it may instead be using the passive coping strategy to cope with the deficient environment, and thus it also has poor welfare. This coping strategy is much less obvious than stereotypy performance; thus care must be taken when assessing the welfare of horses that it is not missed. For this reason more than one measure of welfare is necessary for its assessment. The use of behavioural measures such as incidence of stereotypy, inactivity and avoidance behaviours must be accompanied by physiological measures such as heart rates, cortisol and hormone levels and weight gain and loss. This approach is necessary in order to measure the degree to which the horse is using various coping strategies in attempting to cope with its environment. Having done this, we can then draw conclusions about its welfare.

## REFERENCE

1. Broom, D.M. & Johnson, K.G. (1993). In "Stress and animal Welfare", Chapman and Hall, London.

## ZAJEDNIČKI ČIMBENICI STEREOTIPNOG PONAŠANJA MEĐU KONJIMA

### Sažetak

Ovdje prikazano istraživanje pokušaj je identificiranja općih karakteristika i čimbenika upravljanja među stereotipovima performance konja. Ako se ti čimbenici mogu identificirati, dobiveno se znanje može upotrijebiti za poboljšanje iskustva domaćih konja s okolinom, manje ih izlažući stresu, te za poboljšanje njihove dobrobiti.

Konji toplokrvnog tipa (tj. Thoroughbred/Arap) vjerojatnije su stereotipni u performanci nego konji hladnokrvnog tipa (tj. radni/domaći poni). Toplokrvni konji skloniji su opiranju od hladnokrvnih konja; vjerojatnije je da će reagirati na podražaje okoline aktivnim ponašanjem. Na primjer, vjerojatnije je da će se toplokrvni poplašiti iznenadnih pokreta nego hladnokrvni konji. Može biti da to predisponira toplokrvne konje da reagiraju na taj način na nedostatke u okolini aktivnom strategijom svladavanja poteškoća, kao što su stereotipi. I obratno, hladnokrvni su konji skloni reagiranju na takve poteškoće pasivno, npr. postaju neaktivni i ne reagiraju na okolišne poticaje.

Stoga je važno uzeti u obzir obje vrste reagiranja kad pokušavamo ocijeniti dobrobit konja. Stereotipna performanca može upozoriti da je dobrobit konja slaba jer se služi svojim ponašanjem u nastojanju da svlada nedostatke u svojoj okolini. To ne znači da konj koji doživljava istu okolinu ali se ne ponaša stereotipno ima povoljnu dobrobit; on možda primjenjuje pasivnu strategiju svladavanja nedostataka u okolini i prema tome također je slabe dobrobiti. Ova strategija svladavanja poteškoća mnogo manje je očita od stereotipne performance; stoga valja paziti kad se ocjenjuje dobrobit konja da se to ne propusti. Primjenu mjera ponašanja, kao što je pojava stereotipa neaktivnosti i ponašanja izbjegavanja valja popratiti fiziološkim mjerama kao što su rad srca, razina kortizola i hormona te dobivanje i gubitak težine. Ovaj je pristup potreban za mjerenje stupnja do kojeg konj upotrebljava razne strategije svladavanja poteškoća u pokušaju da svlada poteškoće u svojoj okolini. Kad smo to učinili možemo stvoriti zaključke o njegovoj dobrobiti.

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