

The behavior of feral donkeys (*Equus asinus*) in captivity

L. Flato, K. Houpt & C. Brozowski

Dept. of Physiology, N.Y. State College of Veterinary Medicine, Ithaca, N.Y. 14853-6401, USA

ABSTRACT. *The behavior of feral donkeys (Equus asinus) in captivity.*- The behaviour of captive feral donkeys was studied in order to compare their behavior with that of the free ranging donkey population studied by others. In addition to six feral donkeys, a donkey born by embryo transfer to a horse and a hinny (donkey dam and horse sire) were also observed. The time budget was: eating 51%, resting while standing 8%, standing alert 27%, self grooming 2.5%, walking 6% and sniffing 2.5%. Other miscellaneous behaviors occupied 5% of the animal's time. This time budget was very similar to that of free ranging feral donkeys. The similarity between the behavior of captive and free ranging donkeys indicates that confinement is not particularly stressful to them. Drinking tended to occur more frequently in association with feeding than when the donkeys were not eating. There were some behaviors that occurred more frequently than what has been reported in free ranging females, such as braying (once per hour) and female-female. Urination tended to stimulate urination by other females.

KEY WORDS. Donkey, Behavior, Hinny, Feeding, Drinking, Vocalization

Introduction

The domestic donkey, believed to be descended from the Somali and Nubian wild asses, is an important draft and pleasure animal throughout the world. Despite the large population of domestic donkeys and the presence of feral populations in the United States and Australia there has been relatively little attention paid to their behavior. Klingel (1977) has studied wild asses in East Africa. Whether or not any of these wild asses survive is unknown, but the recent droughts and famine in that part of Africa have probably caused their extinction.

Feral donkeys have been studied more extensively. California desert populations have been studied by Moehlman (1974) and Woodward (1979). McCort (1980) has studied the population on Ossabaw island, which has temperate climate with abundant forage and water. Most recently Rudman (1989) has studied feral donkeys in St. John's in

the U.S. Virgin Island. There have been studies of specific aspect of domestic donkey behavior, in particular, sexual behavior (Clayton et al., 1981; Vandeplassche et al., 1981; Lindsay & Burton, 1983) and social grouping in confinement (French, 1988), but the general behavior patterns of donkeys under conditions of paddock confinement, that typical of domestication, have not been described.

The purpose of this paper was to compare the behavior of feral donkeys in captivity with the previous studies of free-ranging feral animals. We wished to determine whether the presence of abundant food and ad libitum access to water resulted in different time budgets from those in the arid Western deserts from which the donkeys came and in which donkeys had been studied by Moehlman (1974). We also wished to determine if such domestic management conditions as separation of the sexes caused the appearance of unusual behaviors. Finally we wished to determine if the wild caught animals appeared to be stressed by captivity.

Also available to us were two unusual animals,

a donkeys born by embryo transfer to a horse mare and a hinny (donkey dam and horse sire). The behavior of these animals was compared to that other donkeys.

Methods

Six adult feral female donkeys (jennies) of unknown age, one two year old donkey born in domestic conditions by embryo transfer to a thoroughbred mare and a yearling hinny born to one of the feral donkeys and sired by a thoroughbred stallion were studied. Three of the feral donkeys (86, 87, 88) were captured in 1983 from the vicinity of Hawthorne, Nevada and three (75, 76, 78) were captured in 1984 from the vicinity Inyo, California. The animals were housed in a 6x23 m pen. Approximately one quarter of the pen was roofed to provide shelter and shade. The donkeys were fed twice daily at 09.00 and 16.00 h. One bale of hay was distributed on the ground at each feeding. Water was available from an automatic watering device. A salt block was provided. Occasionally a male donkey (jack) was present in a adjacent pen. Horses were always present in an adjacent pen.

A 1 min scan sampling technique was used (Altmann, 1974). The behaviors recorded were: eating hay (a pile of hay present and the observer could see that hay was consumed), grazing hay (there were only wisps of hay on the ground and the observer could not determine whether hay was being consumed), standing alert (ears erect, eyes open), stand resting (to be stand resting two of the following had to be present: ears drooping, hindleg flexed, eyes at least partially closed, mouth partially open), playing (reciprocal biting without threats or submission by two animals or mouthing of the halter of another animal), sexual presentation which included yawning, the repeated raising and lowering of the mandible with extended neck and ears depressed (Lindsay & Burton, 1983), mounting,

aggression (threat to bite, threat to kick, kick, bite or chase), mutual grooming (scratching the body of the other donkey with the teeth during which time the groomed animal usually reciprocates), self grooming (rubbing the body against the fence or against another part of the body and scratching the body with teeth or hoof), braying, mounting, sniffing (nostrils within 10 cm of feces, urine an object, the observer or another animal), and mouthing on the fence. Three behaviors were recorded whenever they occurred: urination, defecation and drinking. The animals were observed for 70 h during daylight hours. Each hour of observation was scored as to whether 50% or more of the time was spent eating hay. The mean temperature on each day of observation was obtained by averaging the hourly temperatures, measured at a weather station 1 km away from the study site, during each day's observation period.

Results

The time budgets of the donkeys and the hinny are shown in table I. The donkeys drank 4.8 times/hr when eating hay, but only 1.1 times per hour when engaged in other activities. The correlation between the number of drinking bouts and the mean daily temperature, which ranged from 7 to 23°C, was not significant ($N=25$, $r=-0.15$, $p>0.5$).

All of the donkeys's brayed at least twice for a total of 109 brays or 1.5 brays/h. Anticipation of food stimulated all the donkeys to vocalize simultaneously, but most brays occurred in other contexts when only one to three donkeys brayed.

The hinny suckled every 2 h. She also was the most aggressive is that 42% of the 97 aggressions involved the hinny; in 29 cases she initiates the aggression and in 12 cases she received the aggression.

Urination occurred 1.8/h and defecation 1.9/h. Approximately half of the urinations (41 of 83) occurred within 5 min of another animals' urination and sometimes the second donkey urinated on the urine of

TABLE I. Activity patterns of captive feral donkeys.
[Patrones de actividad de los asnos salvajes en cautividad.]

Activity	Hinny	Embryo Transfer	87	76	75	78	88	86	All animals	Mean
										Feral only
Eat Hay	43.0	45.6	39.2	45.3	43.4	47.8	38.2	45.9	43.44 ± 1.05	43.1 ± 1.2
Walk	8.2	9.0	5.8	5.4	7.4	3.9	4.7	4.8	6.17 ± 0.59	5.3 ± 0.5
Graze Hay	8.8	12.3	8.7	4.1	10.1	12.9	1.5	3.7	7.77 ± 0.49	6.8 ± 1.8
Stand Alert	15.3	19.5	28.7	31.1	26.2	23.1	38.0	23.4	25.65 ± 0.82	28.4 ± 2.3
Stand Rest	4.8	2.7	9.2	8.0	6.7	5.1	11.2	16.4	8.01 ± 0.50	9.4 ± 1.6
Self-Groom	3.9	3.4	2.7	1.7	1.6	1.8	2.6	2.3	2.51 ± 0.10	2.1 ± 0.2
Sniff	5.9	2.9	1.9	0.6	1.7	1.7	0.0	0.3	1.87 ± 0.22	1.0 ± 0.3
Other	10.1	4.7	4.8	3.8	2.9	3.6	3.7	3.1	4.57 ± 0.27	3.7 ± 0.3

the first and/or exhibited flehmen. There were 15 instances of female-female mounting, seven by the hinny.

Discussion

Captivity and free access to water does not seem to have altered the behavior patterns of donkeys. See table II for a comparison of the time budgets of donkeys in this study with those of free ranging donkeys in various environments. The time spent either eating hay or grazing (searching for bits of hay) comprised the same percentage of the time budget, 51%, as foraging did in the time budget of free ranging feral donkeys in Death Valley (Moehlman, 1974).

A large part of the donkeys' time was spent resting while standing. This indicates that the donkeys had acclimated to the captive conditions. Horses and donkeys can drowse and even slow wave sleep while standing due to the patellar stay apparatus (Winchester, 1943), but lie down in sternal or lateral recumbency in order to rapid eye movement (REM) or paradoxical sleep (Ruckebusch, 1963). Only two of the donkeys were

observed to lie down during these daytime observations, but that is not surprising because equids rarely sleep during daylight hours. Lying and REM sleep are usually restricted to hours of darkness, when, presumably, the risk of predation is lowest.

Perhaps the most interesting finding of the present study was the behaviors exhibited by females that had been reported to occur rarely or never in free ranging females. Among these behaviors were braying and urine marking. McCort (1980) noted that females bray only when separated from their foals. In the present study neither the mother- offspring pair nor any other donkeys were separated. Moehlman (1974), who reported no braying by females, also hypothesized that young males do not bray because they are subordinate to the older territorial males. The females may also be inhibited from braying by the presence of the male. In the present study the females had auditory and occasionally visual contact, but no more than minimal physical or olfactory contact with males. Physical contact or olfactory contact such as urine marking by the jack may be necessary to suppress braying in free ranging females.

Urination appears to be socially facilitated in female donkeys in that half the urinations occurred within 5 min of another. McCort (1980) noted the phenomenon, but did not quantify it. The marking

TABLE II. Time budget of adult donkeys in various environment.
[Reparto del tiempo de los asnos salvajes en diversos entornos.]

Author	Environment	Location	Feeding	Resting	Activity (%)		
					Standing	Walking	Other
McCort	Free ranging	Ossabaw Island, GA	56	15.1	8.6	16.0	3.4
Moehlmen	Free ranging	Death Valley, CA	51	36.1	18.9	8.9	4.0
Rudman	Free ranging	St. Johns, Virgin Island	59	5.1	5.2	5.3	5.4
This study	Captive	Ithaca, NY	51	9.4	28.4	5.3	3.7

behavior observed in which the females urinated on the urine of another female was reported never to occur by Moehlman (1974) and rarely to occur by McCort. The absence of the male may be responsible for the more frequent occurrence of this behavior when the sexes are separated. Similarly, mounting may occur only in the absence of males. The high rate of mounting by the youngest animal, the hinny, may indicate that the behavior is play, but the adult donkeys also mounted in which case it may be a sign that the mounted animal is in estrus. Further indication of that was that sometimes the mounted animal yawed.

The aggressive behavior of the hinny may be due to the fact that she was larger than any of the donkeys. She may have learned that she could usually aggress with impunity. She was still suckling despite the fact that she was two years old, but most free ranging horse allow their foals to nurse until the next foal is born (Berger, 1986). The hinny's activity patterns differed from that of the other donkeys in that she ate less and indulged in other behavior more. She supplemented her diet with milk and, therefore, would be expected to eat less. She spent considerable time in sniffing horses, the barn cats, and even the observer, who was outside the paddock, as well as playing both with inanimate objects and with the other donkeys. This behavior is not unexpected in a young equid.

Walking occurs much less frequently in these conditions of confinement than in free-ranging conditions. McCort reported that the donkeys on Ossabaw Island walked 16% of the day covering 5 to 7 km. It is interesting that in an environment

where food and water were more freely available the animals traveled more. There may have been several reasons for this. The donkeys may have moved to avoid the biting insects and to escape rising tides that flooded the salt marshes that formed the major portion of their diet. In contrast, the Death Valley donkeys tended to stay within 0.5 km of the water source (Moehlman, 1974). An even lower percentage of time was spent walking by the captive donkeys. This is more likely to be due to lack of need or motivation to walk because food and water is provided than because movement is hindered. Domestic horses in a similar paddock will increase the time spent walking considerably when deprived of social companionship, but walk the same amount of time as the donkeys when other horse are in adjacent paddocks (Haupt & Haupt, 1988).

Water does appear to be the limiting resource in the desert environment and the donkeys may drink only once a day (Moehlman, 1974), whereas in a more temperate environment they drink more frequently (McCort, 1980). When water is available freely, as in the present experiment, a different pattern is revealed. The donkeys drank most frequently when they had hay available. This indicates that donkeys are prandial drinkers, as horses (*Equus caballus*) have been shown to be (Laut et al., 1985). The cause of prandial, i.e. meal related drinking, is probably the hypovolemia and hyperosmolality of the blood that accompanies feeding in equids (Youket et al., 1985).

indicated that their general behavior patterns were not greatly modified from their free ranging counter-parts, but some behaviors, not noted in free ranging donkey females, are expressed under conditions of confinement in a relatively large, single sex group.

Algunos comportamientos (p. ej. el rebuzno, una vez por hora, y la monta entre hembras) se dieron con más frecuencia de lo encontrado por otros autores para las hembras en libertad. La micción de unas hembras tendía a estimular la de las otras.

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Resumen

El comportamiento de los asnos salvajes (Equus asinus) en cautividad.

Se estudió el comportamiento de asnos salvajes en cautividad con objeto de compararlo con el de poblaciones de asnos en libertad estudiadas por otros. Además de seis asnos salvajes, se estudiaron un asno concebido por transferencia embrionica a una yegua, y un burdégano (de madre asno y padre caballo). La distribución temporal de actividades incluyó un 51% alimentándose, 8% descansando de pie, 27% en alerta de pie, 2,5% aseándose, 6% andando y 2,5% olfateando. Otros comportamientos ocuparon el 5% del tiempo del animal. Esta distribución temporal resultó muy parecida a la de los asnos salvajes en libertad. La similitud entre el comportamiento de los asnos en cautividad y en libertad indica que el confinamiento no les produce ninguna tensión especial. El abrevaje tendía a producirse con más frecuencia asociado a la alimentación que cuando los asnos no comían.

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