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The significance of training for the behaviour of Steller sea lions (*Eumetopias jubata*) in human care

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Summary

The well-being of animals that are kept in human care is influenced by factors such as food, housing, care taking, social interactions with conspecifics and other species, and health. A deficiency in one of these can sometimes be compensated for by above average quality of another. A deficiency that is not compensated for can lead to stereotyped behaviour.

At the Harderwijk Marine Mammal Park routine-like swimming in a group of 7 Steller sea lions was noticed during the winter season when the park is closed to the public and no training or educational performances take place.

In this study it was investigated whether training could reduce the amount of routine-like swimming. During a period of 6 weeks the animals were alternatively trained and not trained for a week at a time. During the non-training weeks the animals spent 7.2% of the observation time in stereotyped swimming behaviour. This was reduced to 0.5% during the training weeks. We conclude that training has a positive influence on the behaviour of this group of Steller sea lions.

Introduction

The welfare of animals kept by man depends on, among other things, availability of adequate food and water, good housing conditions, care of the animal, social interactions with conspecifics and man, and health. Shortcomings in one of these aspects may be compensated for, at least partially, by above average quality in others. Although on this point knowledge is scarce, it is plausible that, for instance, being housed in a relatively small enclosure can be compensated for to a certain extent by intensive attention from the keeper.

If housing conditions do not meet the essential requirements of the animals involved, and the animals have no control over their own environment, a stage of chronic stress may develop (Wiepkema, 1987). Chronic stress is detrimental, since it may be of negative influence on the health and the behaviour of the animals. Examples of such phenomena are well-known in present-day intensive husbandry systems (Moberg, 1985; Wiepkema and v. Adrichem, 1987); similar examples have been described in zoos (Meijer-Holzapfel, 1968) and dolphinaria (Greenwood, 1987).

In the Harderwijk Marine Mammal Park, Steller sea lions sometimes demonstrate routine-like behaviour which may be abnormal (Wiepkema, 1987). These routines or stereotyped patterns are mainly observed outside the visiting season, when the Steller sea lions are not involved in shows or training sessions. This suggests that intensive contact with trainers may strongly inhibit the performance of stereotyped routines by sea lions.

In this contribution we will present a first and preliminary analysis of the question of to what extent contact with humans may reduce the occurrence of routine-like swimming sequences in captive sea lions.

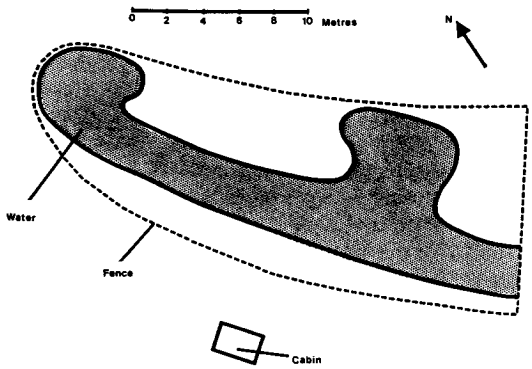

Figure 1. The fresh water pool in which the 7 Steller sea lions were kept.

Materials and Methods

In an outdoor freshwater pool (Figure 1) seven Steller sea lions are housed; one adult male and 2

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adult females (all born in 1972); 3 young females born in 1983, 1985 and 1986 and one young male born in 1984. All the young sea lions are offspring of the adult male and one of the adult females. The youngest female was still being suckled by her mother during the observation period (Nov.–Dec., 1986). In this period water temperature varied from −1°C to +11°C, while air temperature varied from −3°C to +13°C. Near the pool (Figure 1) a small cabin enabled the observers to record the Steller sea lions' behaviour continuously, while the animals could not see the observers.

The observation period comprised 6 successive weeks (4 observation days per week). The Steller sea lions were trained in weeks 2, 4 and 6, and not in weeks 1, 3 and 5. In a non-training week the daily food was presented 3 times a day (7 days per week). The time spent in feeding was minimal (about 5 minutes each time) and the trainers tried to interact as little as possible with the animals.

In a training week, food was presented during 3 feeding sessions of 20 minutes a day, during which the usual trainers interacted with the animals intensively. The animals were trained or asked to perform known behaviours. There were 5 training days per week. On the remaining 2 days the sea lions were fed as in the non-training week. The feeding times were at 09.00, 11.00, and 15.00 hrs during the 6 study weeks.

During the day, direct observations were made between 08.30 and 16.30 hrs. Since the animals could be recognized individually, each Steller sea lion's behaviour was recorded 3 times a day for a period of 15 min. During these periods the following was recorded once per minute:

1) The individual's behaviour; swimming, playing, aggressive behaviour, resting, or suckling;
2) to which conspecific(s) the social behaviour was directed;
3) the individual's location;
4) if stereotyped swimming was observed, its spatial pattern and duration.

The spatial data of categories 3 and 4 were possible since the study area had imaginary landmarks.

To obtain insight in the daily rhythms of activity, every 15 minutes and for each individual, a record was made of whether it was active or resting. During the night hours (19.00–07.00 hrs) the night-watchman recorded once per hour how many animals were ashore (being ashore usually meant resting). Four times a day the climatic condition and water temperature were determined.

Results

During the night most animals (75%) stayed ashore, while during the day they were mainly in the water. Since whenever the sea lions were out of the water they were usually resting, the rhythms of activity

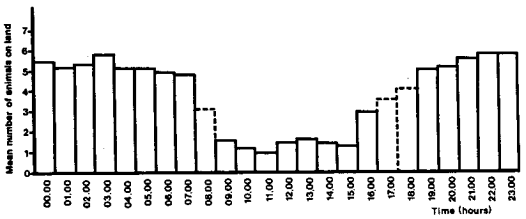

Figure 2. The mean number of animals (of max 7 animals) on land during each hour of the day. N = 24 days. The dotted columns indicate time periods during which only a few observations were done.

shown in Figure 2 are typical of a day-active species. During the active period much play-like behaviour was observed especially amongst the youngsters. Agressive behaviour mainly occurred between the two males, but the frequency of aggressive behaviour did not vary between the training and non-training weeks. A similar conclusion holds for the number of sucklings.

Routine or stereotyped behaviour was performed by all individuals except the youngest (and not yet weaned) female. These behavioural sequences were characterized by a fixed swimming route maintained for some minutes or for up to an hour. Each successive cycle in this swimming routine had a very constant duration (about 30–35 sec).

There was a difference between the score of routine-like behaviour between training and non-training weeks (Table 1). During the training weeks the animals showed less routine-like swimming (the median score per day for all 7 animals was 0), than during the non-training weeks (median score was 19.5). The difference between the two medians is significant (Fisher exact probability test, $P = 0.00005$, Siegel, 1956). Since the maximal score per week for all animals together is 7 (animals) × 3 (focal samples) × 15 (observations) × 4 (observation days per week) × 3 (weeks) = 3780, the data suggest that even in the non-training weeks only a small proportion (7.2%) of the total observation time is characterized by routine-like behaviour (in the training weeks this proportion was 0.5%).

Discussion and conclusions

The data (of Figure 2) show a clear diurnal rhythm in the activities of the Steller sea lions; these mammals are active during the day and mainly at rest during the afternoon and night. This diurnal pattern has also been seen in Steller sea lions in the wild (Orr and Poulter, 1967). This strengthens the representative character of the behavioural data collected during the day. No evidence was found to support the idea that low levels of interaction with trainers (during

Table 1. Total daily score of stereotyped swimming behaviour for all Steller sea lions. (max. score per day: 7 (animals) × 3 (focal samples) × 15 (observations) = 315)

Week	Day	Training		Total score
		No	Yes	
1	1	X		10
1	2	X		6
1	3	X		0
1	4	X		7
2	1		X	0
2	2		X	0
2	3		X	0
2	4		X	5
3	1	X		14
3	2	X		35
3	3	X		52
3	4	X		27
4	1		X	0
4	2		X	5
4	3		X	0
4	4		X	0
5	1	X		25
5	2	X		33
5	3	X		28
5	4	X		12
6	1		X	0
6	2		X	0
6	3		X	2
6	4		X	7

the non-training weeks) influence the occurrence of agonistic and suckling behaviour. This suggests that the performance of at least some of the captive sea lions' normal social interactions is barely sensitive to human attention paid to these animals. However, this attention influences the occurrence of routine-like swimming significantly. Since this type of behaviour had a relatively constant form, was repeated many times and appears to have no obvious reason, it may be called a stereotypy. In the non-training period this stereotyped swimming occurred more often (within the whole group) than in the training period. This suggests that training may compensate for shortcomings in the housing system (perhaps the size of the pool or other aspects of the enclosure). However, the small amount of time spent in this stereotyped swimming suggests that this housing problem is a minor one.

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