

SHORT COMMUNICATION

SOME COMMENTS ON THE REVIEW OF NIMON AND BROOM ON THE WELFARE OF FARMED MINK

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Abstract

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Fur-farming is a politically sensitive issue today. Therefore, discussions on the welfare situation of commercially farmed fur animals may be particularly valuable. The aim of this Short Communication is to address some issues, in addition to those covered in the review of Nimon and Broom on the welfare of farmed mink (Animal Welfare 1999, 8: 205–228), that may have received too little attention. This Short Communication addresses domestication and animal welfare, indispensable resources and behaviours of farmed mink, and the use of negative and positive indicators of welfare in research on farmed mink.

Keywords: *animal welfare, domestication, essential needs, mink*

Introduction

In the introduction of their extensive review on the welfare of farmed mink in relation to housing and management, Nimon and Broom (1999) stated that “welfare refers to the state of an animal at a specific time and can be good or poor irrespective of what people think about the morality of such usage of animals”. This seems an essential background with which to start an objective discussion. However, at certain points within their review, subjects and arguments are introduced that may impede the discussion of the welfare of farmed mink specifically, or of animal welfare in general (for instance, the introduction of an ill-defined term such as “domestication”). The main aim of this Short Communication is to address some issues that may have received too little attention.

In their review, Nimon and Broom conclude that there is considerable evidence of poor welfare in mink kept in the most widely used cages and under normal management procedures. Their conclusion seems roughly based upon three factors: first, the mink’s relatively short history in captivity; second, the presumed essential needs that farmed mink are denied in captivity; and third, the presence of abnormal behaviours. The general question is whether the present scientific knowledge underlying these topics yields such a convincing conclusion as that suggested in the final section of Nimon and Broom’s review.

One of the issues that emerges is the influence of domestication processes on the welfare of animals. Is the concept of domestication too vaguely defined to yield evidence? Indeed, is it relevant for welfare?

A second issue concerns the indispensable resources and behaviours of farmed mink. For instance, the requirement for swimming water for mink is often discussed, and farmed mink presumably need ample locomotion and climbing facilities and extra nest boxes when compared with their wild counterparts (see Dunstone 1993). However, do captive-bred individuals need exactly the same as their wild conspecifics? Can they miss what they do not know?

A third issue is whether we know enough about the nature of stereotypes to interpret them as purely negative — or, do we still need a better understanding of their nature, contexts and development? In the present communication, these three questions are addressed, critically reflecting on the review of Nimon and Broom.

Is domestication a prerequisite for good welfare?

In their introduction, Nimon and Broom discuss the fact that only relatively few captive mink generations have been bred, in comparison to other farmed animals (mink have only been farmed for 80 or fewer years). They then state, “hence, mink are not domesticated in the same sense” (p 206) and suggest this as a possible cause for the behavioural abnormalities that occur in mink. In this way, they suggest a causal relationship between three different factors: fewer generations leads to less domestication, which leads to poor welfare.

First, there is the issue of the extent to which the number of generations is important in relation to domestication. Differences in behavioural responses are often achieved in just a few generations. Consider, for instance, the large number of strains of rodents bred throughout the past decades for laboratory purposes; consider also farmed foxes, in which it is known that different temperaments can be bred for, successfully, within decades (see eg Belyaev 1979; Trut 1999; Rekilä *et al* 1999). The result of domestication seems also to depend on how strict the selection is in order to reach a certain goal, and is not solely dependent on the number of generations.

For mink, the question is whether 80 generations of mink farming is long enough to realise behavioural changes such as those for tameness. In the literature, there seems to be no clear evidence to suggest that selection for tameness is not possible for mink: experience with the mink’s ‘nephew’ the ferret (see Owen 1984) even appears promising. Shackelford (1984) wrote that the behaviour of domestic mink living in close proximity to humans had changed markedly during the past decades: “...the response is one more of curiosity than of anger or fear” (Shackelford 1984, p 232). Furthermore, research on the controlled selection (since 1988) of breeding farm mink has shown that two genetic lines of mink can be created, reacting in either a confident or a fearful manner towards humans (Hansen 1996; Malmkvist & Hansen 1999). In addition, de Jonge (1997) bred strains of farmed mink with different temperaments and found a relationship between mothers and their offspring for fearfulness, curiosity and aggression. These studies, in combination with Shackelford’s observation, suggest future possibilities for breeding programmes that allow the selection of specific trends related to welfare.

One reason why some farmed mink can be classified as fearful (which may induce stressful interactions and reduce the individual’s welfare [see eg Boissy 1998; Hemsworth 1999; Rushen *et al* 1999]) may be the priority of the purposes for which this species is bred. It certainly has not been a priority to breed docile individuals on mink farms. Nimon and Broom’s discussion and conclusions, in which they address the possibilities of selection for tameness in mink, seem rather pessimistic (conclusion [ii], p 222). It is not clear whether their reservations are based on ethical objections or on doubts concerning the biological possibilities.

In addition, tameness is not only the consequence of selection, but also reflects aspects of early experiences, socialisation and/or habituation to regular handling; individuals may adjust to their captive environments during their own lifetimes (see Dawkins 1990; Bakken 1998; Price 1999). Socialisation of animals to humans includes some well-described procedures used by man in order to make animals less fearful of humans (human socialisation processes:

horses, eg Waring 1983; dogs, eg Seksel *et al* 1999). The tameness of laboratory rats (and even our cattle and pets) seems largely to depend on regular experiences with humans early in life. Farmed mink can be handled without gloves if they are socialised to humans in the same way as we socialise our dogs and cats (personal observations). However, mink kept on farms are mostly handled during farm routines, which often involve procedures such as catching, transport, vaccination or veterinary support — all procedures which are of a negative nature and can often be associated with aversion (see also Hemsworth 1999; Rushen *et al* 1999). These farming routine procedures differ greatly from handling procedures that have an intended positive nature, such as those used in human socialisation procedures. None of these aspects are discussed fully in the review of Nimon and Broom.

Second, addressing the relationship between “the degree of domestication” and welfare, it seems evident that wild individuals are adapted to different circumstances from captive bred ones, and therefore have a higher risk of coping poorly with a captive environment. However, common pets and other husbandry animals can also be confronted with circumstances with which they fail to cope (eg Fraser 1968), especially when they are intensively bred for specific characteristic (eg Grandin & Deesing 1998; Steiger 1998) or when they are kept in the highly intensive farming systems commonly used during the last decades (eg Rollin 1995). In contrast, some wild (exotic) animal species appear to adapt to captivity relatively easily, with the help of environmental enrichment and training programmes and when care and housing conditions are sufficient (eg zoo animals: see Hediger 1964; Markowitz 1982; Shepherdson 1988).

In conclusion, there are certain arguments, not mentioned in Nimon and Broom’s review, that cast doubt on the relevance of the degree of domestication (ie the relatively few generations of farmed mink) to welfare assessment. Animals can have good and poor welfare in captive surroundings, irrespective of whether they have been selected for over thousands or hundreds of years, or just a few decades. The assessment of the degree of adaptation to captivity seems pertinent to objective welfare discussions; the “degree of domestication” may be redundant.

Essential needs of farmed mink

It is sometimes suggested that mink behaviours such as travelling and foraging over long distances in the wild, as well as their solitary and ‘amphibious’ life style, cannot be reconciled with captivity. In general, deprivation of essential needs is the main proposed cause of poor animal welfare (see Dawkins 1983, 1988 for a discussion). The essential needs of a species can be approached in the scope of their wild natural environment, and all those elements that animals are denied when in captivity can be calculated at least as a shortcoming (with or without direct consequences for the welfare of the animal) (Thorpe 1965; Martin 1979: both cited in Dawkins 1983). The review of Nimon and Broom mostly seems to conform to this (perfectly sensible) perspective (see conclusion [i], p 222). However, this view does not address the issue of the species-specific needs of animals exclusively or completely. What can we gather regarding the highly flexible and variable life-style of wild mink (see Gerell 1970; Dunstone 1993) for the essentially needed stimuli and behaviours of farmed mink? Are all foraging and hunting activities over large distances essential to mink, or are these dictated by species-specific search strategies and the distribution or abundance of prey (see Dawkins 1983; Price 1999)? And if this is true for a wild individual, is the same true for animals bred in captivity? Animals in captivity may need other elements in their

environment than do their wild conspecifics (Poole 1992; Veasey *et al* 1996), or they may not need what they have never known.

In general, an essential need is an activity or incentive conducted or used by an organism that is vital for its survival or for the survival of its offspring (see Spruijt *et al* 2001). Two sets of needs can be distinguished: first, those that have immediate physiological consequences and thereby provide a means for evaluating the actions of the organism based on those consequences (eg food affects blood glucose and leptin levels, influencing food regulation centres in the brain); and second, activities for which the organism has no insight into the efficacy of that behaviour or that have no immediate advantage for the organism — the best example being reproductive behaviour. Behaviours that do not have long-term reinforcing consequences or that have a low chance of success are rewarding themselves (eg grooming: see Spruijt *et al* 1992). The essential ‘need’ refers to behaviours that are highly motivated in themselves (see eg Hughes & Duncan 1988; Spruijt *et al* 2001). In addition, it might be important to distinguish between essential needs and context-induced needs. Incentives that acquire the status of essential needs after the animal has experienced them are different from conditions that induce a state of chronic stress even when the animal does not ‘know’ which incentive is lacking.

Nimon and Broom do not discuss the consequences of the lack of stimuli or behaviours for farmed mink from these wider general theoretical perspectives. This may have consequences for the final conclusions; physiologically controlled needs (ie food) may be generally accepted as indispensable but, in the case of ethological needs of animals, a limited number of behaviours are commonly accepted as truly essential (dust-bathing for hens might be one of them: see eg van Liere & Wiepkema 1992; Vestergaard *et al* 1997). For many species, as well as for mink, this is still under investigation simply because it is not possible to quantify an ethological need in a simple way. Nimon and Broom rightly mention the preference-testing procedures and the use of the consumer demand theory for assessing animal welfare and ‘ethological needs’ (see Dawkins 1983, 1990), recently introduced and used for farmed mink by Mason *et al* (1997, 1999, 2001) and Cooper and Mason (1997, 1999). Although the studies of Mason *et al* give a better insight into minks’ preferences and the costs (efforts) that mink ‘want to pay’ for accessing the resources, the results cannot yet be applied to farmed mink situations directly: first, Mason *et al*’s experimental mink were directly exposed to stimuli from the resources under test, which could have enhanced their motivation to interact with them; and second, the experimental mink were tested with a range of resources simultaneously, which may have made some resources more or less important than they would be to farmed mink in a barren cage (G Mason, personal communication, 2000).

Improved enclosures that may meet the essential needs of mink more adequately, as suggested in the conclusions of Nimon and Broom, have been studied by Kuby (1982), Jonassen (1987) and Erlebach (1994). Mink in enriched semi-natural enclosures do not perform stereotypies. A new ‘all-in’ housing and management system has been introduced on Dutch mink farms, which seems to result in a reduction of stereotypies (Vinke *et al*, unpublished data). This system features a combination of environmental enrichment, prolonged weaning ages of kits (see Mason 1994, 1996 for the effects of weaning ages on tail-biting and stereotypies), a breeding programme selective for specific trends related to welfare, group housing of mothers with their kits in connected (standard) cages (at least until the kits are 11 weeks of age), and no food deprivation. The results of this study suggest that it might be possible in the future to keep mink in captivity without their expressing abnormal behaviours and to meet their essential behavioural requirements in some way. In their

conclusions section, Nimon and Broom project a rather negative perspective on the possibility of meeting minks' needs in captivity. I believe, however, that it is too early to draw conclusions on this issue.

Negative and positive indicators of welfare

The final conclusion ([xii], p 222) of Nimon and Broom is mainly based on the presence of negative indicators of welfare such as stereotypies and tail biting. I will address two additional aspects, the elucidation of which will benefit further discussion on the welfare of farmed mink.

(i) One aspect, which is hardly differentiated in the conclusions of Nimon and Broom's review, is the issue of whether stereotypies really are sensitive welfare indicators. For instance, Mason (1991a) showed the complex relationship between stereotypies and suffering. She concluded that rules that stipulate 'acceptable' and 'unacceptable' levels of stereotypy will not be useful in improving animal welfare unless they take into account the full range of factors that may influence an animal's degree of stereotypy. This conclusion raises the question of whether simply abolishing stereotypies, especially by breeding selection, is always a good thing (G Mason, personal communication 2000).

In their review, Nimon and Broom correctly mention that stereotypies in mink can vary between individuals, between farms and between seasons (Bildsøe *et al* 1990a,b), but it seems that they do not use this information for a substantiated interpretation of minks' stereotypies in their final conclusion. The observation that minks' stereotypies concentrate particularly around feeding time (eg de Jonge & Carlstead 1987; Bildsøe *et al* 1990a,b, 1991; Heller 1991; Mason 1993; Vinke *et al*, unpublished data), for instance, is one of the factors that should be taken into account when interpreting minks' stereotypies. Increased activity before feeding time is well known in many husbandry species (pigs: eg Terlouw *et al* 1991; poultry: eg Savory & Maros 1993). Small cage environments might induce the alteration of such enhanced activity into stereotypies in the long term. The question is whether these pre-feeding stereotypies reflect preparatory appetitive behaviour related to an imminent stimulus (ie food; see Mason & Mendl 1997). Such pre-feeding behaviours may need a different interpretation than stereotypies performed out of the context of coming food (post-feeding stereotypies in mink occur at a lower level; see Mason 1993). We do not yet know whether there is a continuum from the enhanced activity of an animal aroused by an imminent reward (ie food) to the rigid stereotypy that continues beyond the context of feeding. As the mechanism of stereotypical behaviour is complex (eg Mason 1991a,b; Mason & Turner 1993), we cannot currently interpret all stereotypies as negative. Although Nimon and Broom mention this possibility (p 213, referring to Broom and Johnson [1993]), they seem not to incorporate it into their further discussion. Although the statement that "the very existence of stereotypies indicates an inadequate environment in which mink are having to do much to cope" (Nimon & Broom 1999, p 213) is a sensible one, a purely negative perspective on mink's stereotypies seems rather premature for a final conclusion to be drawn.

(ii) Another aspect elucidating welfare assessment, which is not mentioned in the review of Nimon and Broom, is whether an animal is still sensitive to rewarding stimuli in its environment and is still willing to perform behaviours that have rewarding consequences (see Spruijt & Drabbe Kunzel von Frijtag 1999; von Frijtag *et al* 2000; Spruijt *et al* 2001). The occurrence of these rewarding activities (ie positive indicators of welfare) can be relevant for welfare assessment for animals kept in captive environments. Broom and Johnson (1993) were among the first to describe the measures of good welfare, and included among these the

extent to which strongly preferred behaviours can be shown, and also behavioural indicators of pleasure (p 77). Although studies based on positive indicators of welfare in mink are preliminary and publications addressing this subject are not available yet, female mink as well as their kits play with each other and manipulate and explore all kinds of objects, even in their limited cage environment (personal observations). These kinds of aspects may be important for future welfare assessment as well. Finally, Broom and Johnson (1993) mention in their book other indicators that are important for a consistent welfare assessment. They mention subjects such as life expectancy, ability to grow, reproduction, body damage and disease, and immunosuppression. Addressing these aspects, farmed mink may not score badly (eg Dunstone 1993) when compared with other (intensively) farmed animal species. Nimon and Broom do give some insight into the status of health and disease on mink farms in their review (p 209–210); however, these aspects seem not to be incorporated in their final conclusion ([xii], p 222), which may give the reader a less complete view on the welfare condition of farmed mink.

Conclusions

In summary, the review of Nimon and Broom requires a wider and more precise discussion of the essential needs and the positive and negative indicators of welfare in order to adequately interpret the welfare status of mink. Terms such as ‘domestication’ are best avoided in welfare discussions, especially as more useful criteria exist.

The review of Nimon and Broom (1999) illustrates that research on mink welfare is in a stage of development, which makes the welfare assessment of farmed mink an intriguing process that is not yet complete. Thus, the final conclusion of Nimon and Broom that “there is considerable evidence of poor welfare of mink kept in the most widely used cages and under normal management procedures” seems to be a premature interpretation of the evidence presented in their review. Additionally, they make their final conclusion imprecise by referring without specification to “the most widely used cages” and to “normal management procedures”; these can vary widely depending on the country and the individual farmer concerned.

A review generally serves two purposes: first, to review the existing evidence on a particular issue, and second, to stimulate further studies on that particular issue. Nimon and Broom provide a rather extensive overview of the existing literature on some subjects. Unfortunately, their review pays too little attention to the positive stimulation of, and the future directions for, further research on the welfare of farmed mink. Therefore, I would like to conclude that the continuation and stimulation of studies on the ‘essential needs’ of farmed mink is highly necessary (eg by deprivation tests and operant and classic learning tasks), as we certainly do not know as much about farmed mink as we do about most other farmed species. Also required are detailed analyses not only of the factors involved with positive and negative indicators of welfare, but also of the effects of (early life) experiences in farm situations on the welfare of farmed mink. Furthermore, solution-oriented studies (focusing on farming practice) should be stimulated in order to investigate the effectiveness of different types of enrichment, the outcome of different types of management on farms (eg ‘food puzzles’, time of feeding, handling, group-housing), and the possibilities of breeding programmes for specific trends related to welfare. Because interpretation of behaviour is often ambiguous, conclusions might be strengthened by additional physiological data.

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