

## EARLY WEANING AND MATERNAL DEPRIVATION

In the case of young human children, no-one now doubts that early experiences such as poor mothering or the early, sudden loss of a mother cause distress and can have long-term emotional, behavioural and even neurological consequences. But abrupt separation from the mother well before the age of natural weaning and social independence is almost universal for animals that are either farmed or reared for other human uses (this may also include abrupt weaning from milk to solid food).

Does this matter to the animals? Do they, like humans and some other primates, experience distress and long-term detrimental effects? There is mounting evidence that they do, and some of the research is appearing in a special issue of Applied Animal Behaviour Science.

For farmed animals, weaning and separation from the mother take a number of different forms. A dairy calf is typically removed from the cow after 24 hours of birth but continues to be fed on milk, living either in some degree of isolation or group housed with other calves. Piglets are typically removed from the sow after 3-4 weeks and often this transition includes an abrupt change to a solid diet and mixing with unfamiliar pigs of similar ages. Commercially farmed poultry are artificially incubated and never see their parents or other adults of their species.

**Stěhulová, Lidfors and Špinka (2008)** have attempted to answer the question, is it better to remove the calf after 24 hours before bonding with the mother has fully developed, or to leave them together a few days longer? They looked at how dairy cows and calves react in the one or two days after separation at 1, 4 and 7 days of age and how well the calves habituated to a novel environment 3 weeks later. They found that the cows that were separated later (particularly on day 7 after birth) showed 'a much stronger and longer lasting response to separation than those that were separated on the first day after birth' and that the calves were also more restless after separation at 7 days than at day 1. In addition, the cows reacted more strongly when they were allowed to see and hear their calves after they had been separated.

In the longer term, the welfare balance may be reversed. The calves separated later (at 7 days, still very early indeed compared to a natural situation) seemed to have benefited socially from spending a few days more with their mothers, in that they adapted more quickly to a novel environment. Previous research seems to corroborate that later separation may help calves to be socially more confident later in their lives (see Flower and Weary (2003)).

Although presenting a welfare conundrum, this research tends to support typical farming practice of removing the calf at one day old, which is anyway commercially desirable in order to get the cow back into the milking parlour. But a note of caution is in order here, because these results are so difficult to interpret in terms of the animals' subjective experiences. Are we trying to minimise distress for the animals or for ourselves? Clearly no good farmer likes to witness the separation distress of cow and calf, and would rather do the separation when the animals give the least observable reaction.

The cows and calves separated at 7 days made it particularly clear that they were strongly motivated to stay together. But can we be sure that cow and calf are experiencing less distress just because they express less seeking and vocalizing behaviour when they are separated at 24 hours rather than a few days later? Age, physical ability, and the animals' 'beliefs' and expectations about their situation must play a part. The heart-rate data are similarly not easy to interpret. The fact that the cow searched and called less when her calf was taken out of sight and sound need not necessarily mean that she was less distressed by the separation— perhaps the cow 'believed' that she could still do something to get back to her calf when she could see and hear it, and in the complete separation situation she 'gave up' more quickly. One could have wished that the observations had been carried on for much longer in time and compared with the reactions of cows and calves who were moved to new housing but not separated. But in spite of the complexities, these experiments make it clear that separation at 1, 4 or 7 days provokes a strong distress response from the cow and is likely to affect the long-term welfare of her calf.

**Weary, Jasper and Hötzel (2008)** have reviewed the literature to disentangle what it is that young pigs and calves are expressing when they react to separation and weaning and to look at how commercial practices might try to minimize weaning distress. They show that young mammals' reactions are natural behaviours (eg calling more when hungry or cold) designed to elicit care from the mother and have a basis in neurochemicals involved in attachment. The young are probably distressed both by the loss of the dam and by the loss of milk. For example, calves react much less to separation when they are provided with a greater quantity of milk than is typical in commercial systems (perhaps compensating for the loss of the mother)?

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In commercial situations, the young animals face a number of factors during weaning which all interact to create the total impact of the experience on the animal (separation from the dam, change of diet, change of environment, mixing with unknown animals, quality of environment such as indoor or outdoor housing). Piglets are sufficiently stressed by weaning that they often lose body weight for several days afterwards, a situation described by the authors as 'an obvious welfare concern for those animals, and ...an important production challenge for the livestock industry.' Farrowing systems that allow the piglets and dam to spend more time away from each other and the piglets to get used to a change in diet before being removed (ie more consistent with natural conditions) may help piglets adapt better to weaning in commercial conditions. Interestingly, there is evidence that piglets reared and weaned outdoors may be better able to cope with the stresses of weaning, and those reared and weaned in barren indoor conditions may have comparatively worse social skills.

**Latham and Mason (2008)** have reviewed the evidence that maternal deprivation affects the long-term behaviour of animals from laboratory rats to farmed pigs and chickens to elephants and monkeys, including the behaviour of institutionalised human children. They argue that maternal deprivation has a role in stereotypic behaviour, which is a common response to captive conditions, and suggest that the term 'stereotypic behaviour' should be updated to include 'repetitive behaviours known to stem from some environmental deficit causing frustration or CNS dysfunction, such as belly-nosing in piglets and allo- and teat-sucking in calves.'

The authors present and analyse a wealth of evidence that loss of maternal care leads to abnormal behaviour and a lower ability to cope with captive conditions. Captive-born chimpanzees, rats, mice, rhinos, beech martens and perhaps polar bears show more stereotypic and abnormal behaviour in captivity than wild-caught individuals who have had a normal rearing experience with their mothers. Belly-nosing by piglets and calves sucking other calves are both most likely redirected behaviour caused by loss of the mother and early weaning. This seems confirmed by the fact that the stereotypic sucking of calves can be reduced by allowing them to suckle briefly from a cow.

The earlier weaning happens, it seems, the more abnormal the young animals' behaviour. This has been demonstrated for piglets (belly nosing), laboratory mice (bar biting), a redirected escape behaviour when the weaned mice try to return to their mother), farmed mink (pacing, tail-biting), horses (cribbing or wind sucking, ie the horse grips a surface edge and swallows air), monkeys (self-biting). Lack of maternal care is also implicated in feather pecking in hens. Pullets (young laying hens) brooded and mothered by a hen for 8 weeks (until the hen lost interest in them) were found to be 3.5 times less likely to feather peck when 3 to 7 months old.

The authors discuss a number of ways in which maternal deprivation can lead to abnormal behaviour: these include frustration of their motivation to suckle or to have contact with the mother, frustrated attempts to escape or jump out of a cage, possibly to return to the mother (mice, piglets), earlier exposure to barren commercial environments and diet (cribbing of horses, belly-nosing of piglets), heightened fearfulness/aggression characteristic of maternally deprived animals and changes in brain function.

Together these papers (and others in the special Applied Animal Behaviour Science issue) are immensely illuminating on the ways in which weaning and deprivation of maternal care affect the experience and behaviour of young animals both immediately on separation from their mothers and in the longer term, to the extent of producing behaviour that would be considered pathological if it occurred in humans. It is a sobering thought that our current practices affect the welfare of billions of animals yearly. Some changes to commercial practices, such as later weaning of piglets, 'get-away' farrowing systems, allowing dairy calves to suckle from a surrogate mother, avoiding (or phasing) mixing of piglets or isolation of calves, enriched or outdoor housing, are already practised in the best and most innovative farms and could be made part of normal good farming practice.

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## References

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