



Guest Editorial

Post-weaning Feeding Problems in Young Domestic Cats – A New Hypothesis

The young of domestic cats generally start to move onto solid foods at around 30 days (Turner & Bateson, 2000). Changes in the kittens' gut morphology and digestive biochemistry at the time of weaning, defined as the time when dietary dependence on the mother changes most rapidly, probably have the same pattern as those found in the rat. The lining of the small intestine of the rat is relatively smooth before weaning, but after weaning the villi rapidly proliferate (Herbst & Sunshine, 1969). In addition, the enzyme lactase, which is used for digesting milk sugar, is replaced by sucrase, which is used for digesting the sugars in solid food (Henning, 1985; Lund & Smith, 1987).

The timing of the changes in the digestive system are closely linked to the various factors that affect the timing of weaning (Gomendio *et al.*, 1995). In the cat, if the mother is small, under-nourished or is burdened with a large litter, the rates of increase in weights of her kittens slow down prior to weaning, but increase again in the days after the kittens take their first solid food (Bateson & Young, 1981; Deag *et al.*, 1987). In such cases the mother has probably reached the limit of her ability to supply sufficient energy from her milk for the continued growth of her kittens, but rapid gain in weight resumes as soon as the kittens are able to process solid food.

From 30 to 65 days after birth, kittens which are with their mothers may sometimes lose their appetites, start vomiting and develop diarrhoea. The condition is quickly and readily treated with antibiotics. An example from one litter of pure bred Egyptian Maus is shown in Figure 1. The discontinuity in the rate of growth occurred at the age of 27 days after birth and the loss of appetite started at the age of 60 days. The day after being given antibiotics the dramatic catch-up in growth is evident. Similar effects have been observed in seven other Egyptian Mau litters from three mothers. Colleagues have reported similar phenomena in other pure breeds

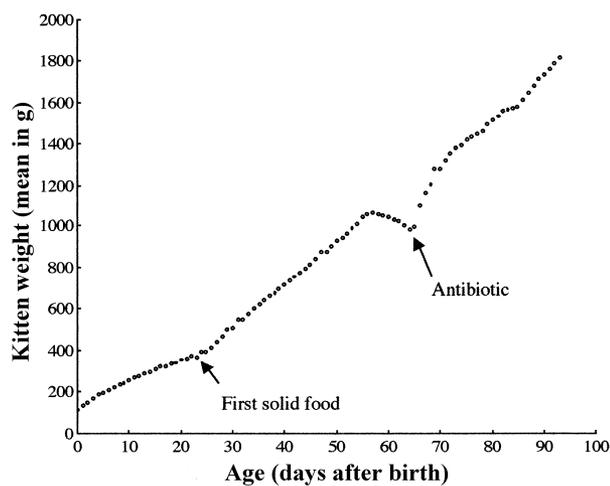


Fig. 1. Mean weights of four pure-bred Egyptian Mau kittens. The litter was the mother's second. After developing diarrhoea, the kittens were given 0.25 mg per day of clavulanate-potentiated amoxicillin (Synulox, Pfizer).

and some examples from laboratory cats may be seen in Deag *et al.* (1987).

What is the explanation for the kittens' digestive problems? Possibly some bacterial infection carried by the mothers is the source of the trouble, but this seems unlikely, at least in the case of our Egyptian Maus, since the problem in litters from mothers which had experienced digestive difficulties with their previous litters was eliminated by not offering the kittens solid food before 30 days after birth. The problem might be related to the mothers continuing lactation at a stage in the kittens' development when, under natural conditions, she might have been forced to seek solid food in the form of prey and, as a consequence, spend much less time with the kittens (Turner & Bateson, 2000). Mothers kept indoors with their kittens and provided with *ad libitum* food

are much more likely to continue suckling than those that are able to move away from their kittens and are motivated to do so. Continued lactation would have provided milk sugar for the kittens which, if the analogy with rats is correct, they could no longer digest. This undigested lactose would then have provided nutrients for the extravagant growth of *Escherichia coli* in the gut. A number of easily tested possibilities flow from this conjecture.

If the bacterial bloom hypothesis is correct, the *E. coli* counts should rise sharply in kittens that take solid food before 30 days and the mothers of which continue to lactate after weaning. The hypothesis is supported by the evidence that the kittens do not lose appetite and weight if they are not given solid food before 30 days, or if their mothers are excluded from them after they have taken solid food. However, why are mothers that are able and willing to leave the house in the post-weaning period less likely to have kittens that exhibit the syndrome we have described here? Why has the problem never arisen in the Russian Blues that we have bred (15 litters from four mothers), nor in many laboratory cats? The kittens of the two pure breeds of which we have extensive experience differ strikingly in their behaviour prior to weaning. From about three and half to four weeks after birth, Egyptian Maus, in litters of all sizes, are extremely eager to take solid food, whereas the Russian Blues are much less ready to do so. If the hypothesis is correct, the induction of sucrase synthesis in the intestine – and the corresponding inhibition of lactase – may be less pronounced in the kittens that are slow to start eating solid food. Whatever the explanation, the advice to breeders who experience delayed post-weaning feeding problems in their kittens is to keep their kittens away from solid food before 30 days or, if that

is not possible, to separate mothers from their kittens as soon as they are weaned.

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