

Birth weight and postnatal growth of pure-bred kittens

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Abstract

Data on body weight of pure-bred kittens (Maine Coon, Norwegian Forest Cat, Birman, Persian, Siamese/Oriental Shorthair Cat) from birth (n 245) to 12 weeks of age (n 135) were obtained from breeders. Absolute birth weight (in g) was higher in larger breeds than in smaller breeds, whereas relative birth weight (in % of mature female weight) tended to be higher in smaller breeds (Maine Coon 115 g, 2.3%; Norwegian Forest Cat 106 g, 2.7%; Birman 97 g, 2.8%; Siamese 92 g, 2.8%; Persian 82 g, 3.2%). Relative birth weight was lower than that described in the literature for colony cats. Relative litter weight was highest in Norwegian Forest Cats (14.6 (SD 1.8)%; n 10) and lowest in Birmans (8.8 (SD 3.1)%, n 7; $P < 0.05$); the other breeds were in-between (11.9 (SD 2.0)%; n 19). Absolute growth was faster in larger breeds than in smaller breeds. In relation to expected mature weight, there was good agreement with data from colony cats but no clear-cut effect of breed size. There appeared to be a trend to an earlier onset of sexual dimorphism in larger breeds.

Key words: Birth weight: Pure-bred kittens, kitten growth

Data on birth weight and growth of kittens are important for factorial calculation of requirements. In addition, they are very helpful for health monitoring of kittens. So far, there have been numerous data on colony cats (non-pedigreed European shorthair cats^(1–4)) but to our knowledge, there is very little information on pure-bred cats, only covering the breeds Abyssinian, Exotic Shorthair and British Shorthair Cats^(1,5). These studies have indicated similar allometric effects in cats as in dogs^(6,7), i.e. a smaller relative birth weight in larger breeds. The larger British Shorthair Cats took longer to reach their mature weight than the smaller Exotic Shorthair Cats⁽⁵⁾, which is another similarity to the allometry of growth in dogs. Therefore, in the present study, data from breeders' weight protocols were evaluated to fill some of the gaps in our knowledge on birth weight and growth of pure-bred kittens.

Materials and methods

In the present study, data on body weight of pure-bred kittens (Maine Coon, Norwegian Forest Cat, Birman, Persian, Siamese/Oriental Shorthair Cat) from birth to 12 weeks of age were obtained from breeders (Table 1). In the context of another study on mature weight of pure-bred cats⁽⁸⁾, breeders were contacted at cat shows in order to weigh and score adult pure-bred cats. Some kittens happened to be on these shows and were weighed. Several breeders then offered their records on kitten growth. For these records, kittens had been weighed

on the breeders' own scales. Some breeders had weighed their kittens for many weeks, others only for a few days after birth. For retrospective evaluation of these data, mean values and standard deviations were calculated. The differences between two means were compared by student's t test, and more than two means by one-way ANOVA and Holm–Sidak test using Sigmastat™ 3.0 (SPSS Inc., Chicago). Relative birth weight and relative litter weight are expressed as a percentage of normal body weight of female cats of the same breed as determined in another study⁽⁸⁾ (see Table 1).

Results

Absolute birth weight (in g) was higher in larger breeds than in smaller breeds, whereas relative birth weight (in percentage of mature queens) tended to be higher in smaller breeds (Table 1). Relative litter weight was highest in Norwegian Forest Cats (14.6 (SD 1.8)%; n 10) and lowest in Birmans (8.8 (SD 3.1)%, n 7; $P < 0.05$); the other breeds were in-between (11.9 (SD 2.0)%; n 19). Absolute growth was faster in larger breeds than in smaller breeds; however, in relation to expected mature weight, there was no clear-cut effect of breed size for the first 12 weeks of life. Norwegian Forest Cats and Maine Coons showed a significant sexual dimorphism at 84 d. The Birman males weighed at 28 d were heavier than the females of the same age. The Birman kittens weighed at 84 d, however, did not show sexual dimorphism, neither did the Siamese and Persian kittens of both age groups.

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Table 1. Birth weight and weight development of kittens (Mean values, standard deviations, number of kittens)

Breed	Birth weight			Body weight (g) at 28 d						Body weight (g) at 84 d								
	in g			As a percentage of adult female weight†			Males			Females			Males			Females		
	Mean	SD	n	n		Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	
Maine Coon	115 ^a	19	79	79	2.4	558	54	26	530	46	27	1985	189	19	1772*	162	15	
Norwegian Forest	106 ^b	18	107	107	2.7	465	63	48	448	63	56	1582	163	26	1350*	152	26	
Birman	97 ^c	17	19	19	2.6	430	68	24	371*	57	10	1208	113	8	1212	65	4	
Siamese	92 ^{c,d}	9	25	25	3.2	449	38	13	440	45	11	1283	114	8	1243	160	10	
Persian	82 ^d	7	15	15	2.6	389	64	7	353	24	5	1372	159	10	1327	223	9	

^{a,b,c,d} Mean values with unlike superscript letters were significantly different ($P < 0.05$).

* Mean values were significantly different between males and females ($P < 0.05$).

† Maine Coon 5.0 kg, Norwegian Forest Cat 3.9 kg, Birman 3.5 kg, Siamese 2.9 kg, Persian 3.1 kg⁽⁸⁾.

Discussion

As data collection was done in retrospect when breeders offered their growth protocols in the context of another study, obviously, the distribution of data is not systematic. Many breeders use weight control in newborn and suckling kittens as a diagnostic tool to detect potential problems in the kittens or dam. They often stop weighing them at a later age. Therefore, there were more data on newborn kittens than on older kittens in the breeders' weight protocols. Also, kittens were sold and thus the numbers decrease with age. Some older kittens happened to be present at cat shows and were weighed there. This explains numbers of kittens increasing with age in some cases. It means that data are in part longitudinal and in part cross-sectional. It is therefore possible that some effects of sex or breed may have been overlaid by breeder effects, especially in those breeds where numbers increase with age. The scales used by the breeders were not standardised. Therefore, increased errors are possible. Systematic errors, however, such as that the weight of all kittens is either over- or underestimated are unlikely. They might occur in breeds where only a small number of kittens from one or two breeders were weighed. It is also possible that still-born kittens or kittens dying shortly after birth are omitted from these protocols. It is likely that the majority of such kittens are runts. The net result would be an overestimate of mean birth weight and an underestimate of litter weight. Nevertheless, the data do give an idea of the birth weight of viable pure-bred kittens.

The relative birth weight of the pure-bred kittens followed the same allometry as the birth weight of puppies, i.e. smaller relative birth weight for larger breeds^(6,7). By contrast, litter weight did not change with breed size. As in dogs, litter size increased with breed size. Interestingly, the relative birth weight of privately owned pure-bred kittens was lower in the present investigation and also in another study (weight of mature females and relative birth weight in Exotic Shorthair Cats 3.2 kg and 2.9% and in British Shorthair Cats 3.9 kg and 3.1%⁽¹⁾) than the birth weight described for non-pedigreed colony cats (approximately 3.5 kg and 3.3%⁽¹⁻⁴⁾) or for Abyssinian colony cats (weight of mature females 2.9 kg; relative birth weight 4.4%⁽¹⁾), regardless of breed size. With the exception of Birmans, the litter weight was the same in pure-bred cats as in colony cats. A lower relative birth weight and the same relative litter weight can only be explained by an increased number of kittens per litter in privately owned pure-bred cats. These findings make it appear unlikely that the data presented are seriously compromised by the possibility of omitted runts. It is unclear whether this is a management or a breed effect. Compared with domestic cats, wild cats have a higher relative birth weight (3.7%^(9,10)) compared with female mature weight (3.6 kg).

During postnatal growth of kittens, a lower birth weight was rapidly compensated. In relation to mature weight, the data on pure-bred kittens do not systematically deviate from those of colony cats^(2,4). At present, it is not possible to either exclude or confirm an allometric effect in growing kittens such as a faster relative growth of smaller breeds. At the age of

12 weeks in females, who mature earlier than males⁽⁴⁾, such a tendency could be postulated from the present study (i.e. significantly higher percentage of expected mature weight reached in smaller breeds), but not in males.

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