

## FOOD AND GROWTH OF KITTENS

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Newborn puppies and kittens are less mature physiologically and biochemically than the young of many species, and considerable changes take place during the first few days of life. They have no insulating layer of subcutaneous fat and thus are unable to maintain body temperature in a cool environment. Because they can use anaerobic glycolysis to provide energy, however, they are extremely resistant to a lack of oxygen; puppies have been resuscitated 26 minutes after total privation, while adults can survive only 2 or 3 minutes without oxygen. Published figures for the Ca:P ratios of bitch and queen milks, if correct, suggest a major difference in calcium and phosphorus metabolism in these 2 species; for dogs the Ca:P levels (in mg%) are 230:160, for cats 35:70, or ratios of 1.44:1 vs 0.5:1. Calcification of bones after birth does not keep pace with bone growth but actually decreases during the suckling period, nor do calcium phosphate supplements have much effect. The body stores and milk iron are not sufficient to maintain hemoglobin at the neonatal level, primarily because of the rapid increase in body size. The hemoglobin at birth, in fact, constitutes a reserve supply of body iron and is not fully replenished until after the suckling period when meats, etc, are fed.

The rapid growth of kittens is closely correlated with the high protein content of the queen's milk. Thus for cat, pig and man, which double their birth weights in 7, 18 and 180 days, respectively, the pro-

tein levels of milk solids are 49, 33 and 14%. Kittens will often reject or thrive poorly on cow's milk (3.5% protein) but accept and grow well on evaporated milk, which has about twice as much protein. As dietary protein concentration is decreased, cats tend to eat more food and increase daily caloric intake, from about 80 kcal/kg body weight on a 46% protein diet to about 100 kcal on 19% protein, with the calories supplied by protein remaining fairly constant. Cats require not less than 30% of their calories as protein for satisfactory growth, and about 20% for adult maintenance, but this high requirement is apparently not conditioned by a specific amino-acid demand. The cat may have an enzyme system which requires a high protein intake for most efficient function.