ABSTRACTS

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Food intake and nutrition in pregnancy, lactation and post-weaning neonates

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In mammalian species, the connexion between reproduction and nutrition is undeniable and illustrated by numerous publications: its role concerning regulation of hormonal secretions, fertility, pregnancy outcome, lactation and neonatal development indeed retains the attention of the scientific community. Most of this literature essentially concerns either human beings or farm animals but the interest on the influence of nutrition in dog and cat reproductive physiology is growing. Awareness on the key aspects of feeding during critical periods like pregnancy, lactation and weaning is essential to optimize the reproductive performances in these species.

It is important to keep in mind that nutrition might impact pregnancy outcome even long before breeding, in relationship with the body condition score of the animal. Indeed, as described in human beings, under/overweight conditions might be related to reproductive issues because of hormonal interference: hormones like leptine and estrogens are produced by fat tissue, and inadequate body condition score might therefore affect the reproductive function by disrupting normal cyclicity and fertility (1). This is clearly outlined in human beings, and recent reports in small animals let us think that the same might occur in these species (2). The body condition score should also be checked throughout pregnancy: overweight was proved to affect parturition unfolding in bitches (3), maybe like in women because of a decrease in strength of the uterine contractions during delivery (4). Clear nutritional indications should therefore be given when dealing with a pregnant bitch/queen. Regarding the bitch, pregnancy can be divided in two main periods on the merge of the 40th day of gestation. If no or few changes are observed up to the 40th day of gestation, the bitch will gain considerable weight after that period. If a maintenance diet will be sufficient during the first part, an increase of 10% in energy each week from the fifth week of pregnancy is therefore recommended. Concerning cats, the energy intake increases in a linear way, as soon as the pregnancy begins. This increase can be estimated around 10% a week, with a tendency to slow down during the last week of gestation. The need for an increased intake of energy starting at the very beginning of gestation is related to the inability of the queen to cover her high energy requirement for lactation. In fact, during this period, she will have to mobilise fat tissue to ensure a proper milk production. So, if a bitch, just after delivery, has to approach its pre-breeding weight, a queen still weight 20% more than her reference weight. The diet fed to the pregnant animal must at least follow AAFCO minimal recommendations, i.e 22% proteins, 8% fat, 1% Ca and 0.8% P for dogs and 30% proteins, 9% fat, 1% Ca and 0.8% P for cats. In addition to this, specific nutrients were proved to be beneficial towards reproductive performances. In canine, the role of folic acid has been outlined to lower the impact of cleft palates and today supplementation is usually recommended when dealing with predisposed breeds (5). In feline, taurine - an essential aminoacid in this species- is also of critical importance, since a taurine deficiency can lead to embryonic resorptions. The level where disorders are observed varies between studies from 0.02% to 0.05% of taurine in the diet, but higher levels allow normal reproduction. During the lactation period, mothers should be fed ad libitum using the same diet than during gestation. Unbalanced diets might favor occurrence of eclampsia. Milk production might also be affected, and neonates might suffer from it at two different levels. At first because of lack of colostrum intake: in most countries, no colostrum substitute is currently available for dogs and cats so different strategies can be adopted to overrun this problem. The best option would be to use a foster mother, but when this is not possible the use of frozen colostrum or oral administration of adult serum are alternatives to consider. When doing this in cats, it is of great importance to ensure first blood compatibility between the used donors and the kittens to prevent them from developing neonatal erythrolysis. It is important to keep in mind that nutrition might impact pregnancy outcome even long before breeding, in relationship

Monetading of food intake is also of great importance at the time of weaning. The food transition at weaning usually generates stress, with diarrhea as the main clinical symptom. Since weaning also correspond to a period of immunological gap, the impact of digestive pathogens (like paroviruses, coronavirusas, trichomonas, … ) might therefore be enhanced. The feeding plan should be accurately managed in order to

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decrease as much as possible this potential predisposing factor. By the time the neonate is 3 to 4 weeks old, dry food can
be mixed with water and/or milk replacer in a 1:3 ratio to form a gruel. If canned food is preferred, a 2:1 ratio can be made.
Water intake will increase once offered, so drinking water should be offered at 5 weeks. By 6 weeks of age, 50% of the
puppy/kitten’s diet should be from unmixed puppy or kitten food. Puppies and kittens can be totally weaned from the dams’
milk at approximately 6 to 8 weeks. Recent research showed that the more the number of meals, the better the quality of
puppies faeces: therefore, a 4 meals/day basis should be adopted in order to minimize the impact of weaning on digestive
stress (Grellet A., pers. comm.).

(1) Brannian JD et al. Baseline non-fasting serum leptin concentration to body mass index ratio is predictive of IVF outcomes. Human reproduction. 2001; 16 (9) : 1819-1826
(2) Ishioka K et al Plasma leptin concentration in dogs : effects of body condition, age, gender and breeds. Res. Vet Sci. 2007; 82:11-15