Nutrition for the Breeding and Lactating Bitch

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There are numerous factors, both reproductive and non-reproductive, which influence the outcome of a breeding and ultimately the health and nature of the puppies. Of relevance to this topic is the effect of nutritional support on the health of the breeding bitch during pregnancy and lactation, and the health, growth and development of the puppies. Nutrition is an important factor throughout a dog's life, but it is especially critical during the breeding and lactating phases of the bitch and the early developmental windows of puppy growth (pre-, neo-, and post-natal).[1]

Feeding the pregnant bitch:

Some general guidelines can be given to increase the likelihood of success for pregnant bitches. With great variation in breeds, it is best if each pregnancy is managed on an individual basis, to address the individual bitch depending on her breed, the stage of pregnancy or lactation, and her litter size.

At least 2 weeks before breeding commences, it is recommended to transition a breeding bitch to a high quality, highly digestible diet which is nutrient and energy dense. This is necessary to meet her needs during gestation and lactation without excess food consumption, reducing the risk of gastrointestinal upset or weight loss. Transitioning early allows the dog to fully adjust to her new diet before pregnancy. [2]

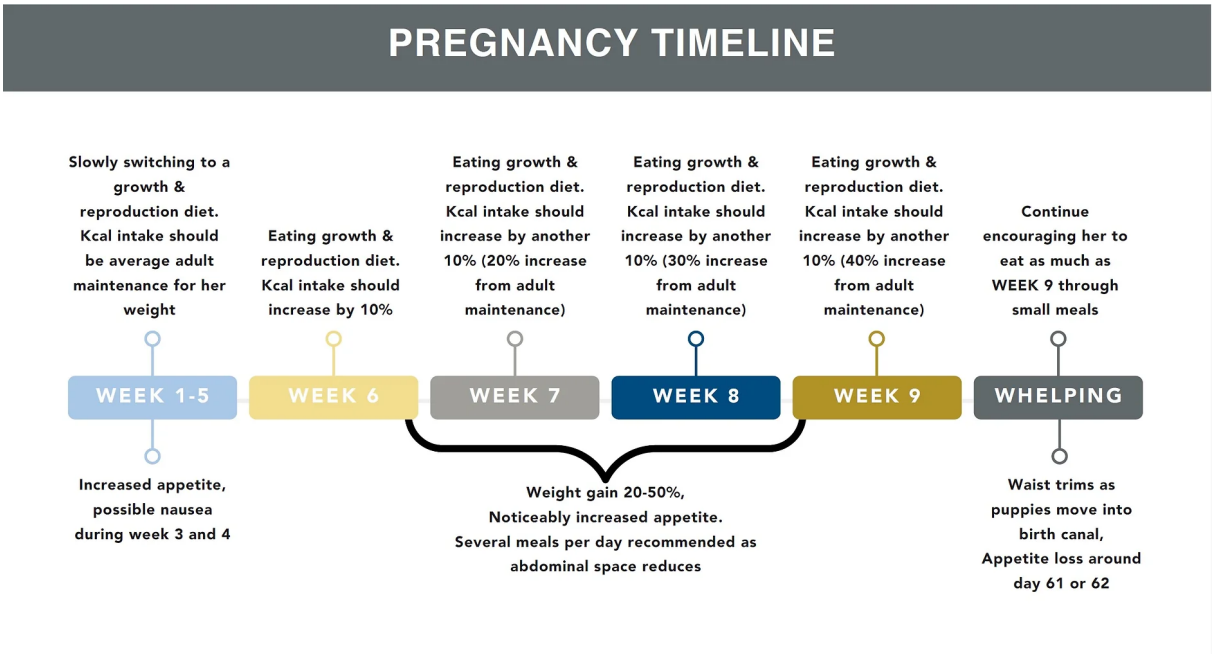
The nutritional demands placed on the bitch during pregnancy and lactation are very high, especially during the last few weeks of pregnancy.

Pregnancy in dogs can be divided in two distinct phases. More than 70% of the foetal growth will occur after the first 5 weeks of pregnancy, and weight gain is usually minimal before 40 days after its start. During the last 3 – 4 weeks of gestation in bitches, the foetuses will grow rapidly, leading to a body weight increase of 15–25%.[3]

As an overview, the bitch's diet must support 3 key areas:
1) body condition maintenance for the bitch,
2) the growth of her reproductive tissues, and
3) the growth and development of her puppies.

Together, these nutritional demands during pregnancy and lactation can increase her normal maintenance requirements to 3 to 5 times higher.[1]
A diet containing at least 4000 kcal ME (metabolizable energy)/kg dry matter (DM) is usually recommended after the 42nd day of gestation in dogs.[3]

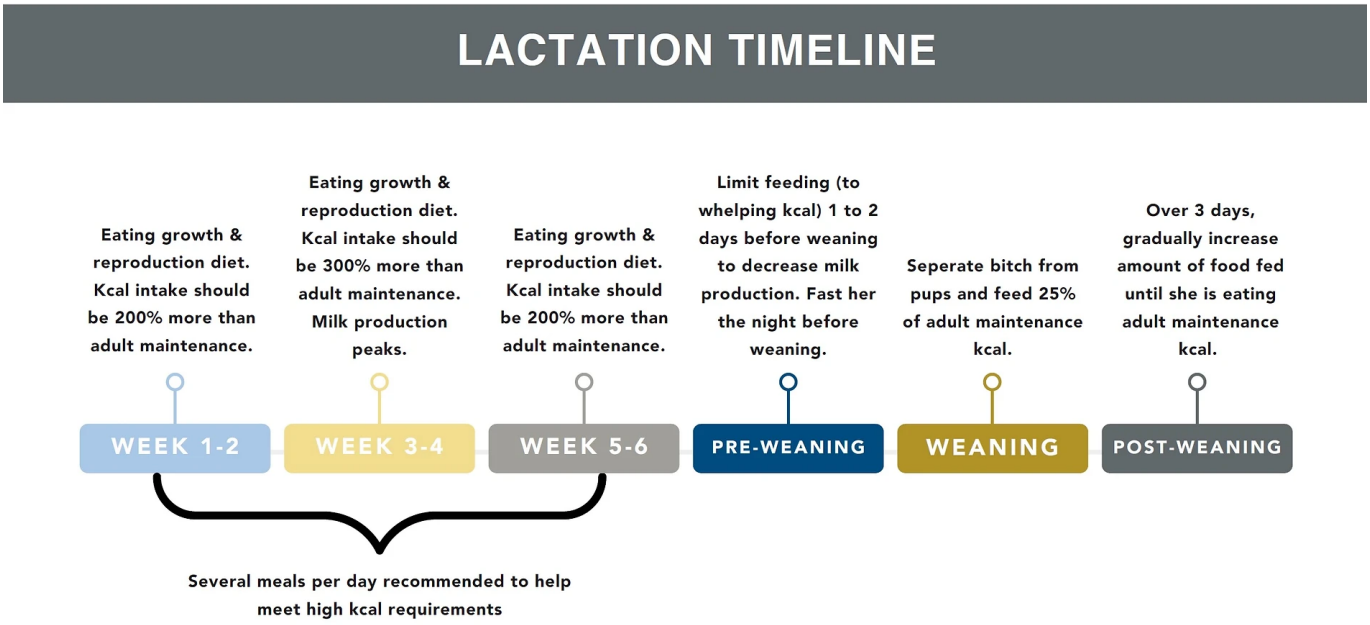
It is recommended to feeding a diet containing animal protein as the primary protein source at a level of 28% to 30% (as fed). The energy density of the food should be relatively high, that is, at least 20% fat (as fed) is recommended.[2]

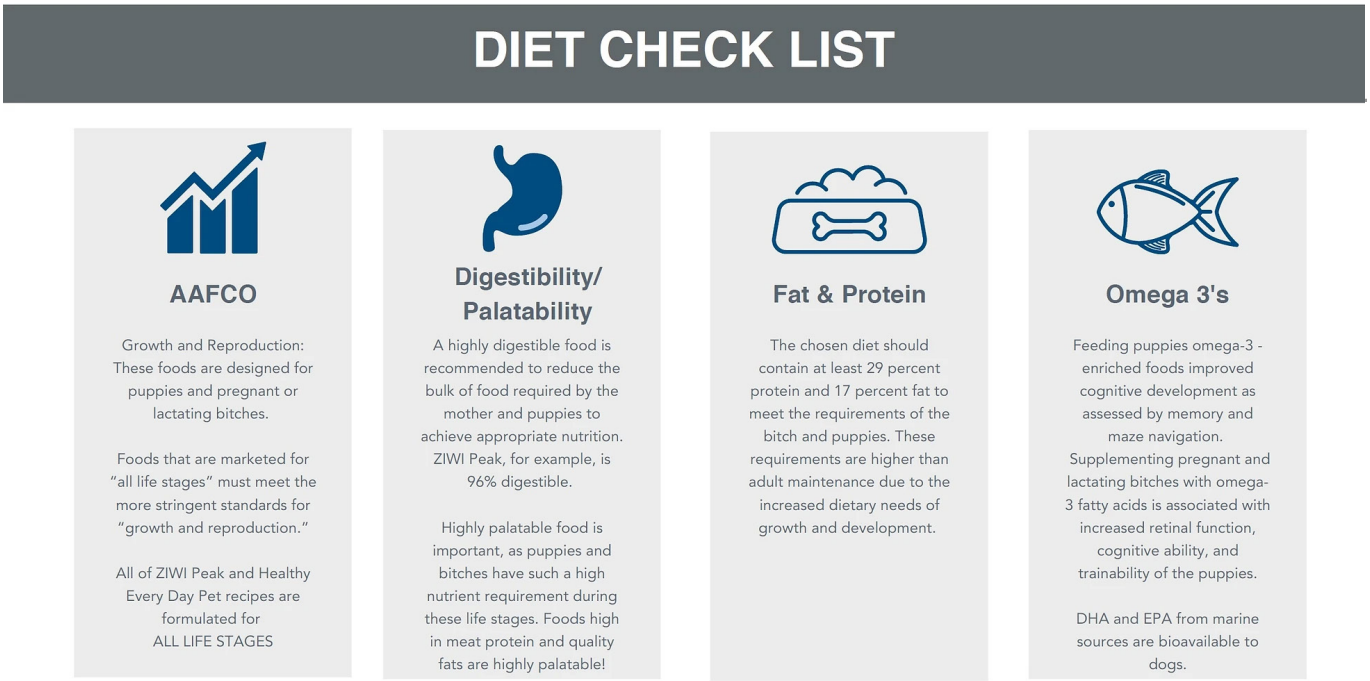


Food intake during lactation in dogs

Lactation lasts approximately 7–8 weeks in dogs, with a peak milk production. The amount of milk produced depends upon many factors (e.g. litter size). A high amount of energy is required to sustain this physiological process. On average, bitches will consume 1–1.5 times their maintenance energy requirements during the first week of lactation, two times maintenance during the 2nd week, and 2.5–3 times maintenance during the 3rd and 4th week post-partum.[3]

The diet fed during lactation will impact the quality of milk produced. For example, the level of fat and the quantity of essential fatty acids influence the quality and quantity of fat in the milk during the lactation phase.





Essential fatty acids

A diet high in essential fatty acids (EFAs) supports both maternal health and the growth and development of her puppies.[3] Recent research suggests that pregnant bitches have a higher need for EFAs, especially omega 3s. During gestation and lactation there is an increased need for supply of EFAs to supply foetal tissues via the placenta and after birth through the milk. Thus the pregnant bitch's EFA status is negatively influenced by the physiological stress of pregnancy and lactation. There is an increased risk of reduced EFA status in bitches who have had multiple litters. [3]

What are essential fatty acids for dogs?

Dietary fatty acids are grouped into three types: omega 3s, omega 6s and omega 9s. Fatty acids can then be further classified into essential or non-essential.
Omega 9s are non-essential, as dogs can synthesise these in their body.
Dogs are not capable of synthesising certain omega 3 or omega 6 fatty acids in their body, hence these are essential and must be provided as part of their diet.

Omega 3s:
- Alpha-linolenic acid (ALA)
- For dogs to use ALA, it must be converted to EPA & DHA, thus it is more efficient to maximise EPA & DHA in the diet, rather than ALA.
- Eicosapentaenoic acid (EPA)
- Docosahexaenoic acid (DHA)

Omega 6s:
- Linoleic acid (LA)
- Arachidonic acid (AA) is non-essential for dogs as it can be efficiently converted from LA

What are the EFA needs of pregnant and lactating dogs?

It is recommended to ensure the pregnant bitch's diet contains both omega 6 and omega 3 EFAs. The ideal ratio is between 5:1 and 10:1.[2]

Of particular importance to reproducing females and their developing foetuses is the omega 3 fatty acid DHA. DHA is essential for normal neurological and retinal development in puppies. Sufficient DHA must be supplied in the diet of the dog.

EFA effect on litter size

- A report in 2000 suggested that maintaining bitches on a diet containing the appropriate level of both omega-6 and omega-3 fatty acids increases litter size and decreases still-births.[4]
- A 2001 conference paper demonstrates that reproductive activity (parity number and litter size) reduces maternal EFA stores in a linear fashion, particularly for the omega-3 fatty acid DHA.[5]

Importance of diet

In a 2004 conference paper, it was demonstrated that reductions in maternal EFA status could be attenuated via dietary intervention.5] A study using 60 research Beagle bitches of similar genetics compared the effect of 3 diets differing in fat profiles on the EFA status of both the bitch and her puppies and maternal reproductive performance over four sequential parities. This study produced 3 critical findings:

(1) while maternal EFA status were influenced by the stage of reproduction, any reduction in maternal EFA status could be minimised by supplying the appropriate levels of both omega-6 and omega -3 fatty acids in the bitch's diet

(2) maternal EFA status, including DHA, could be maintained across multiple parities, and

(3) puppy DHA status was dependent upon the maternal pre-breeding DHA status and maternal dietary DHA supply.

Puppies of mothers who were fed a high EFA diet that was balanced for both omega 6 and omega fatty acids had a higher EFA status at birth than did puppies born to mothers fed a diet containing a less favourable EFA profile. This effect was most pronounced for the omega-3 fatty acid DHA.

Lactation

Newborn puppies can convert milk ALA to DHA (with low efficiency) early in life, but lose this ability, or it is greatly reduced, after weaning.[7]

Thus it is important that the lactating bitch's diet contains good sources of both AA and DHA to supply her milk with EFAs to support normal neurological and retinal development of her puppies.

Puppies benefit from EFAs post weaning

In a 2012 study, puppies were fed one of three diets from weaning - low DHA diet vs moderate DHA enriched diet vs high DHA enriched diet). [8]

- The researchers found a strong correlation between DHA content of the diets fed and improved visual function (as assessed by use of electroretinography).

- Cognitive function tests conducted when puppies were between 8 and 13 weeks of age showed that puppies fed the moderate or high DHA diets had fewer errors for reversal tasks as well as other significant differences for cognitive function tests, compared with puppies fed the low DHA diet.

Product spotlight: ZIWI Mackerel & Lamb

ZIWI Mackerel & Lamb recipe provides quality nutrition for the pregnant and lactating bitch and her puppies.

- all recipes contain high quality animal protein that is highly biologically available and digestible (95.6% digestibility)

- this recipe contains whole, wild caught blue mackerel. As a nutritious oily fish, this provides an excellent dietary source of EFAs for dogs of all life stages

- all ZIWI recipes are nutrient dense

- ZIWI contains high levels of crude fat percentage, that is the fat which naturally occurs in the meat of the source animal species.

- ZIWI contains no unnecessary carbohydrates.

- As per AAFCO and NRC guidelines, carbohydrates are not considered an essential dietary nutrient for dogs and cats. Dogs and cats source glucose and energy from fat and protein.

References:

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