**CANINE NUTRITION**

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| **INTRODUCTION**  Whenever nutrition is discussed it is of value to reflect on the needs and requirements of the dogs' ancestor the primal wolf, which goes back thousands of years.  This animal existed initially without the intervention of man. For day to day living the ancestral dog had four basic behav­ioural traits in relation to food. These characteristics exist ge­netically to some degree today. These are:  Finding, chasing, killing and eating.     The initial characteristic requires the animal to detect and find the food. This activity takes energy and time. Once the prey is detected the chase begins.  The chase as such would use up huge amounts of energy and at the same time may have ended without the animal succeeding. In this case hunger drove the animal to further quests.  The kill also used up a large amount of energy and finally left the animal with a voracious appetite.  As well the physical effort of using the teeth to kill, pull and chew cleaned and massage the teeth and gums. This activity helped remove any baby teeth and in the older dog worn or in­fected teeth.  The feast then began and many organs of the kill would have been ingested, including bones, fur, fat, heart,  lungs and intestines as well as the muscle or meat.  This necessary pattern was essential for survival and evolution of the species. Three factors emerge.     First, an enormous amount of energy was required for the tracking, chasing and killing of the food, Second, eating was sporadic and thirdly, when an animal managed to acquire food, all the material was eaten not just the meat. The genes responsible for this activity have evolved in our dogs today, and yet we provide our dogs with an entirely different environment.  We rarely exercise them enough, we give them food regularly and we often feed them diets that are deficient in essentials. To examine natural nutritional requirements it is essential to understand that there are different needs at the various phases in an animal's existence.  **NEONATE PUP, 0 - 5 WEEKS**     At birth the pup receives all its nutritional requirements from its mother. This is provided via the breast milk.  The initial secretion is called colostrum which is rich in protein and antibodies to all the 'bugs',that the animal has developed an immunity to. This immunity is passed on to the pup. Among the essentials that are in the milk.is calcium. This element is present at a constant level.  If the mother's intake of calcium is not sufficient to keep up with the demands of the milk production then calcium is removed from her blood stream with a resultant drop in her blood calcium levels. This condition known as 'hypocalcaemia' causes the condition 'milk fever' where the conduction process is affected and the animal may suffer fits and collapse.   Administration of calcium intravenously will reverse this position.  This is why it is necessary for calcium intake for a pregnant and nursing mother to be adequate.  As the mother is providing energy and protein for her off ?spring it is necessary for her to increase her daily  intake.  Assuming a healthy mother and puppy, then the mother's milk should be adequate until weaning.  **BABY PUP 4 - 8 WEEKS.**  Weaning usually takes place around three to four weeks, but can be earlier or later.  At this stage the pup commences its greatest challenges nutritionally and socially.  As the pup decreases it mother's milk intake, it needs to replace those vital ingredients with a source that is not so exact, and is of a different consistency.  The muscle and bone tissue are starting to show massive growth and will require extra protein. The skeletal  system will be starting to change from cartilage to bone, so that calcium and protein requirements will increase.  **YOUNG DOG 8 - 20 WEEKS**  This is where the animal, (especially the large breeds) will start to really grow skeletally. The process involves the soft cartilage tissue being replaced by solid bone, and requires large amounts of calcium.  When insufficient calcium is supplied then the result will be reflected in the composition and structure of the bones. This mineral is a vital dietary ingredient up until skeletal maturity at around eighteen months of age.  **JUVENILE DOG 20 -75 WEEKS**  At this stage the young animal is increasing its energy requirements and a the same time building up muscle.  Protein intake is at its premium at this stage.  The animal is at its energetic peak. To ensure that the energy intake is balanced by energy usage animals must be en­courage to exercise and stretch themselves physically. When this does not happen we are laying the foundation for obesity, unfitness and the subsequent consequences. Carbohydrate needs to be burnt up, muscles and tendons should be stretched, and the circulatory and cardiac system ex­tended.  **MATURE DOG 1.5 - 8.5 YEARS**  The animal is at maintenance at this stage with fluctuating energy requirements. Protein and fat needs are governed by variables such as outside temperature, exercise, illness etc.  If the animal is living or spending time outside then the energy requirements will increase or decrease depending upon the ambient temperature. Dogs can virtually melt away during cold months if their owners fail to increase the available food. Naturally therefore in the hot weather animals can increase their weight as the energy requirement decreases during the hotter months.  **GERIATRIC DOG 8.5 YEARS ON**  As the body slows down it becomes more susceptible to dis­ease and problems. This necessitates varying nutritional intakes as the need arises.  However, one of the most often made errors is the assumption that the geriatric animal needs to slow down and exercise less. As long as the animal is capable, exercise levels should be maintained. The heart muscle in particular needs to be kept fit, unless there is any degeneration present. If diseases such as degenerative arthritis or heart failure are present then exercise will become more of a difficulty. In these cases it is important to regulate the food intake accordingly. Otherwise the calorie intake will exceed output. The resultant obesity will further exacerbate the disease and the animal slowly degenerates.  ***SPECIAL NEEDS***  **GENERAL:**  As we said earlier, genetically the dog is programmed to go through fixed phases in order to eat. However adaptation to modern life has changed all that.  Nowadays we feed an animal regularly, without the demand for exercise. There is no chase and no kill. We feed dogs soft foods with the odd bone.  This creates problems from an early age. Without the tearing and mastication required in the killing and  eating process the jaws of young animals are not subjected to the rigorous activity which stimulates muscle and bone development.     Deciduous or baby teeth are not massaged to fall out. They may remain in place and in many cases without the natural proc­ess need human intervention in order to be removed, so that they don't interfere with the development of adult teeth.  Adult teeth and gums will not be massaged and cleaned when fed soft modern foods, so that food particles and bacteria can stay around the mouth causing calculus build up with resultant infection along the gums and tooth root. Exposed or degenerate teeth are not removed as soon as they would be naturally as there may be no tearing or massaging that would occur in the wild.  Eventually the teeth can become infected so badly that they must be cleaned or removed, or indeed will just fall out.     Practically and ethically we cannot simulate the kill, and our animals are now adapted to regular feeding. We still must, how­ever, give our animals an effective amount of exercise in order for them to develop and maintain their bodies, While dry food will assist in the maintenance of a healthy mouth, feeding long bones and hide bones will ensure the up­keep of the gums and teeth, and assist in the removal of the deciduous teeth.  The fibre requirements that used to be provided from the carcass of the kill must now be provided as a supplement. Most prepared foods contain a sufficient fibre content to cover this need.  There are 90 essential ingredients required in mammalian food. These are 16 minerals, 16 vitamins, 12 amino acids and 3 fatty acids   A deficiency in any one of these ingredients can cause a clinical problem.     It would take a book to explain all the problems if we discussed each and every one of them so we will pick the most identifiable.  **MINERALS**  These nutrients are the regulators of the body's dynamic balance. Minerals act as a group rather than  individually. Their interrelationship is so delicately balanced that an overdose of one mineral can create a  deficiency of another one.  Though the symptoms of mineral imbalance are observed fairly often, it is extremely difficult to determine the specific mineral involved, as the same signs often occur with several deficiencies.     Again most commercially developed products have sufficient mineral content.     It is worthwhile discussing one mineral in particular - calcium.  Calcium deficiency in the dam and pup has been discussed.  However what is often forgotten is the possible heed for calcium supplementation in the older dog. As the animal ages it is possible when we examine X-rays that an osteoporotic process takes place. The bones are often thinner and this may lead to softer bones at the joints. This may contribute towards degenerative arthritis.  **VITAMINS**  These nutrients are dietary essentials that are often administered improperly in lieu of accurate diagnosis.  In reality there is little need to worry too much about vitamin deficiencies today as most of the prepared foods provide ad­equate vitamin content. There is however no harm in adding minimal vitamins to the diet in order to guarantee that the full complement is available.  **PROTEIN**  While generally we provide our dogs with adequate protein, it is important when feeding commercial foods to carefully read the label. Many times there have been examples of owners simply feeding inadequate food amounts which results in protein deficiency.  **SUMMARY**  Most commercially produced foods have adequate ingredients included in their formula. The quantities fed however must be taken into context with the stage of life of the dog. There is still a need to supplement diets at various times throughout a dog's life. It is also vital to as much as possible include adequate exercise and environmental enrichment in the dog's everyday existence. |