

# MODERN CONCEPTS OF FEEDING OF INDIAN PET DOGS

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Feeding of dog is one of the most important management practices of the dog owner. Nutritional management is, recognized as an integral part of both preventive health care and treatment protocols for medical and surgical patients. The interaction between illness, health, and nutritional status is multifactorial and complex. Therefore, the initial nutritional evaluation of an animal requires integration of the history, physical and laboratory examination.

Daily feeding recommendations are usually based on energy requirements calculations. This amount should be modified based on continual evaluation of the animal's body weight and condition, and physiological or pathological conditions.

## OBJECTIVES OF DOG FEEDING:

Dog nutrition is in between human and farm animal nutrition or closer to human nutrition, although aim of serving food to both species is living long, healthy and happy life. The

objective of feeding dogs is to support optimum physical and physiological health, strong musculoskeletal development, optimum body weight and growth, strong immunity and body resistance, bright eyes, alertness and mental health, healthy skin, lustrous glossy hair coat, small firm stools and vitality contributing to quality life and rewarding human pet animal relationship.

Nutritional requirements vary according to breed, size, age, growth and body weight, pregnancy and Lactation, physiological status, level of activity, exercise, health, stress level and biochemical individuality. Nutrient requirement standards have been established for growing pups, reproducing females and for maintenance of adult dogs

## NUTRIENT REQUIREMENTS OF DOGS:

The nutrient requirements in terms of metabolizable energy (Kcal/w<sup>0.75</sup> kg), fat (g/kg body wt), protein (g/kg body wt.) and AAFCO Dog Food Nutrient Profile are tabulated below:

### 1. ME Requirements per day

	(Kcal/w <sup>0.75</sup> kg)
Infant	132
Growing	264
Adolescence	200
Pregnancy	188
Lactation	470

### 2. Fat Requirement per day

Maintenance	1.0g/kg body wt.
Growth	2.7g/kg body wt.

### 3. Protein Requirement per day

Maintenance	4.8 g/kg body wt.
Growth	9.6 g/kg body wt.

### 4. AAFCO Dog Food Nutrient Profile

Nutrient	Maintenance	
<b>Growth &amp; Reproduction</b>		
Protein	18%	22%
Fat	5%	8%

Linoleic Acid	1%	1%
Calcium	0.6%	1%
Phosphorus	5%	0.8%
Vitamin A (IU/kg)	5000	5000
Vitamin D (IU/Kg)	500	500

### **LIFE STAGES OF DOGS AS PER NUTRITION POINT OF VIEW:**

Dog's life may be categorized to three life stages.

1. **The paediatric stage:** From birth to 1 year age is called paediatric stage.
2. **Maintenance stage:** It is from one to eight years stage in which growth is restricted but animals maintain their body wt.
3. **Geriatric stage:** It is old age stage generally after eight year in which animals are unable to maintain their body weight and activity.

### **DIFFERENT APPROACHES OF DOG NUTRITION:**

Nutrition of the dog has different approaches which are:

1. Healthy dog nutrition.
2. Supplementary nutrition- in deficiency conditions or under nutrition, poor nutrition or malnutrition
3. Corrective nutrition - in excesses of nutrients and supportive clinical nutrition in disease conditions.

### **FACTORS AFFECTING SELECTION OF DIET:**

Knowledge of owner on nutritional aspect.

1. Nutrient requirements of dog.
2. Palatability and digestibility of the food.
3. Physiological as well as pathological state of body.
4. Life stage of the dog.

### **FEEDING OF DOGS:**

#### ***Feeding of weaned puppies:***

A diet containing cereal flour, milk, egg yolk and cream should be prepared. The diet should be in the liquid form containing 25-30% OM. It should be fed at the rate of 15% of body weight. The amount of food offered to a pup varies depending upon its size, activity, metabolism and environment. Young pups should be fed at least thrice a day.

#### ***Feeding of pups:***

Under normal conditions, new born pups are nursed by their mother through natural mammary feeding and they learn to share mother's food at 1015 days of age. But if mother is unable to feed their pups due to any reason, artificial feeding is recommended from first day onwards. The colostrums from another mother may be provided or fed with cow milk which is boiled and then mixed with eggs.

If one wants to prepare pup starter it should contain 30-35 per cent protein and 30-35 per cent fat and carbohydrate. It should be supplemented with vitamins and mineral mixture. Fresh drinking water should be available ad-libitum.

#### ***Feeding of the mature dog:***

The dog which is at its complete growth, with maximum weight is supposed to be mature. There is no body weight gain at this age. They require only maintenance type diet and have lowest requirements. The recommendations for mature dog can vary with species, breed, health status, function and activity. Care should be taken that the time of feeding remains same each day with fresh and clean water which should be available at each hour.

#### ***Feeding of pregnant bitch:***

During first 6-7 weeks of gestation period (average 65 days), the nutrient requirements of bitch are not much higher than the maintenance requirement. But in last 2-3 weeks of gestation, the requirements of bitch increase. The bitch should be offered diet several times a day to meet out these requirements in last phase of pregnancy. Some time bitch refuses to eat at whelping stage which is a normal behaviour.

#### ***Feeding of lactating bitch:***

Bitch will start eating with in 24 hours of whelping. The lactating bitch's food and water

requirements increase because of the milk production during lactation. At peak lactation, its food intake may be two to four times more than her maintenance food intake.

#### ***Feeding of Geriatric dogs:***

As the age increases, the nutritional requirements are also changed. The Geriatric dogs require a low calorie diet. The fat content should be low with increased level of dietary fat. Protein requirements are also increased during old age.

#### ***Feeding of Athlete Dogs:***

Dietary fiber and oligosaccharides as an aid to energy through SCFA; antioxidant vitamins E and C inhibit free radical production in skeletal muscle during rigorous exercise; food additives (dimethyl glycine (DMG), pangamic acid-vitamin 815, arginine, tryptophan, aspartate, camitine, creatine/ATP and bicarbonate) have been suggested to improve the performance of racing dogs; high protein (>30 or 40% of energy) and high fat (>50% of energy) diet to meet energy demand of exercise and endurance (Sahoo and Singh, 2006).

#### **TYPES OF DOG FOOD:**

The dog feed may be of two types based on method of preparation.

##### ***1. Home made foods:***

These foods are prepared at home for family members and are fed to their pets also as such or with some supplements.

##### ***Reasons to feed home made food:***

1. Some pet owners feed their pets with home made food on emotional reasons.
2. Some are strictly vegetarian as per Indian tradition and therefore, like their pet to eat vegetarian diet only.
3. Some consider that nutrient requirements of the pets are similar to human beings and prefer home made feed.
4. Some prefer home made food as it is economical than commercial food.

***iv. Canned dry foods:*** This type of food contains meat and meat products at varying levels. It has 74-78% moisture content. Low level meat containing foods are similar in composition to

#### ***Disadvantages of home made food:***

1. It may not be a balanced diet.
2. It is an unscientific feeding.
3. It requires labour to prepare home made food.
4. It leads to more nutritional disorders and deficiency symptoms in comparison to commercial pet food.

#### ***2. Commercial pet foods:***

These are the foods, which are prepared and packed scientifically according to the requirements for different ages, functions and activity at commercial scale. They provide all the nutrients to the pet if fed according to the recommendation and prescription of the specialist. Any commercial pet food is required to be delivered to the animal at the best of its nutrition, sensory and other quality parameters considering animal requirements.

#### ***Commercial dog foods are of four types:***

***i. Dry pet food:*** It contains less than 12% moisture. Most dry foods contain 18-27% CP, 15% fat and 35-50% carbohydrates. It is prepared by mixing of cereal grains, cereal by products, soybean products, meat, milk products, poultry by products, fats and oils, mineral and vitamin supplements. Advantages of dry food include a lower cost than canned or soft- moist food, and refrigeration of unused portions is not required. Dry food may also provide beneficial massage of the teeth and gums to help periodontal disease. If pet food contains 12-18% moisture then it is called semi dry food.

***ii. Semi moist dog food:*** It contains less than 35 % ( 18-35%) moisture. It is prepared by mixing of animal products, fat and oils, soybean products, cellulose, mineral and vitamin supplements.

***iii. Soft dry food:*** A modification of semi moist food which is known as soft dry foods is also available. It contains lower proportion of fresh meat and meat by products. A low pH which is about 4.2 acts as a preservative for such foods. dry foods to which water has been added before canning. Advanced of caned food is include along self life durable container and high palatability were as, no beneficial effect on the teeth and gums and increased cost than dry food.

### Feeding Schedule for Various Categories of Dogs

Body Wt. (kg)	Amount of Various Feeds (gm per day)			
	Cereals, Vegetables	Meat	Milk	Bone (Steamed)
5	200	100	100	One metacarpal or metatarsal of goat/ sheep
15	600	300	100	
25	1000	400	100	
<b>Mature Dogs</b>				
5	100	50	50	One long bone of goat or sheep or small bone of buffalo
15	200	100	100	
25	400	100	100	
40	500	150	150	
50	600	200	200	
70 & above	800	200	200	
<b>Pregnant Bitch</b>				
10	200	100	50	Fresh long bone of goat/ sheep
20	350	100	100	
30	550	200	150	
40	600	200	150	
50	700	250	200	
<b>Working Dogs</b>				
30	1400	300	500	One fresh long bone of buffalo
40	2000	300	500	
50	2500	300	600	
60	2800	400	600	

### Semisolid Diets for Dogs

Ingredient (%)	Diet - 1	Diet - 2	Diet - 3
Cereal flour	10	5	10
Groundnut cake	15	15	15
Meat meal	-	15	15
Skim milk	45	-	-
Sucrose	20	15	20
Animal fat	5	5	2
Propylene glycol + Sorbitol	4	4	4
Mineral mixture + Common salt	1	1	1
Water	-	30	33

Skim milk may also be replaced by eggs.

### Modification of diet for young Pups:

Ingredient (%)	Diet - 1	Diet - 2
Dried milk powder	200	-
Milk	-	700
Cream	200	200
Egg yolk	-	50
Boiled water	400	-
Rice gruel	200	50

### Nutrients for pet animals:

Although the functions of nutrients in

the body of dog and other species remain the same, the proportion, percentage, methods,

means of feeding and objectives in pet animal nutrition differ considerably from that of farm animals. The importances of different nutrients are summarized as:

### **1. Energy:**

The energy requirement of an individual dog is the level that will support metabolism during the various physiologic states: growth, maintenance, gestation, lactation, old age, or disease. Resting energy requirement (RER) is the largest component of energy expended by an animal under fasting, thermo neutral, non-ambulatory conditions. It is closely correlated with lean body mass. RER is commonly estimated by anyone of several empirically derived estimation equations.

### **Equations to Estimate Canine Resting Energy Requirement (RER) in kcal of ME**

Allometric:  $RER = 70(\text{body wt. in kg})^{0.75}$

Linear (>2 kg body wt.):  $RER = 30(\text{body wt. in kg}) + 70$

Maintenance energy requirement is a function of RER depending on the individuals "Life style". It is highly variable between individuals and requires continual adjustment based on body condition. In addition to supplying the proper total number of ME calories/ day, the optimal range of ME derived from fat, carbohydrate, and protein varies depending on physiologic status of dog.

### **2. Protein:**

Essential amino acids must be dietary constituents because they can not be synthesized within the dog's body. The dietary requirement for protein is satisfied when the dog's metabolic need for amino acids and nitrogen is satisfied. Amino acid requirement as a percent of diet generally decline from birth to maturity. Protein requirements of animals vary with age, activity level, temperament, growth rate, reproductive dog foods have a combination of cereal and meat proteins.

### **3. Carbohydrate:**

The carbohydrate added to pet foods are mainly in the form of polysaccharides (starch and cellulose), disaccharides (sucrose and lactose), and monosaccharide (glucose and fructose).

Properly cooked non-fibrous carbohydrates are better utilized.

### **4. Crude Fibre:**

Crude fibre consists mainly of cellulose and lignin, and is a portion of food that is resistant to hydrolysis by mammalian digestive secretions. It is not, however, an inert traveler through the GI tract. Increased levels of crude fiber in dog rations increase faecal output, normalize transit time, depress, alter glucose and insulin kinetics in diabetic animals, and affect hepatic and peripheral metabolism of lipoproteins. Dietary fibre is a nutritionally, chemically and physically heterogeneous material. This heterogeneous mix can be categorized into two major subclasses, i.e., soluble-viscous-fermentable fibre (soluble) and insoluble-nonviscous nonfermentable fibre (insoluble). The two subclasses have different roles in the digestive/absorptive processes within the gastrointestinal tract. The ratio of insoluble to soluble fibre (I:S) in dog food can affect overall diet utilization and appears to be important in the formulation of diets to provide optimal fecal characteristics and intestinal fermentation. Many benefits have been linked to fibre in human diets, such as positive influences on colon cancer, type II diabetes and obesity, and as an aid in establishing bowel movement regularity (Anderson *et al.*, 1994). Dietary fibre may be an important ingredient in dog diets when considering the long-term health and well-being of the pet. Varying I:S in dog diets results in changes in fecal characteristics and digestibilities at the terminal ileum. As the ratio increases, there is an increase in fecal output. A soybean hull-containing diet with a low I:S (<2) decreases the amount of wet feces excreted and minimizes negative effects on ileal digestibilities of nutrients in the diet (Burkhalter *et al.*, 2001). Diets containing soybean hull that have higher I:S fibre ratio (>5) will also minimize detrimental effects on nutrient digestibilities at the ileum, but will result in higher wet fecal output.

Fibre and fructo oligosaccharides (FOS) and gastrointestinal health: It ferments to short chain fatty acids (SCFA), which have three major effects: i) they are absorbed from the colon and contribute to colonocyte nutrition and health; ii) support the energy balance of the host; iii) they

acidify the colonic environment; and by virtue of their osmotic action they draw water into the stool, increasing bulking (Simpson, 1998; Pasupathy *et al.*, 2002).

### 5. *Fats:*

Dietary fat consist mainly of triglyceride with varying amounts of sterols and phospholipids, and is a concentrated source of energy. Dogs have a dietary requirement for Linoleic acid, which is found in appreciable amounts in corn and soy oil. High- quality fats are the most digestible component of the diet, and dogs can tolerate quite high levels. However, in addition to the problem of supplying an excessive amount of energy with high fat diets, caution must be used to avoid suboptimal intakes of protein, minerals, and vitamins.

Fat content of commercial foods varies widely based on the diet purpose work; stress, growth, and lactation require higher levels than maintenance. Essential in the structure of cells and for the production of some hormones, fats are an important form of stored energy. They are required for absorption and utilization of fat-soluble vitamins, and they insulate and protect under the skin and around the internal organs.

Essential fatty acids (Linoleic acid) must be provided in a pet's diet because they cannot be synthesized by a dog in sufficient amounts. A deficiency of essential fatty acids may result in reduced growth or increased skin problems. Omega-6 and omega-3 fatty acids play a vital role in healing inflammation. Replacing some omega-6 with omega-3 fatty acids can lessen an inflammatory reaction-whether it is in the skin (from allergies), the joints (from arthritis) and the intestines (from inflammatory bowel disease) or even in the kidneys (from progressive renal failure). The optimal ratio of omega-6 to omega-3 fatty acids for dogs is between 5 and 10: 1.

Triacylglycerols and free fatty acids; contribute to insulin resistant state by promoting insulin secretion by Pancreatic  $\beta$ -cells. Arachidonic and other fatty acid metabolites: Contribute to regulation of expression of key proteins involved in adipose tissue metabolism and insulin signaling. Gamma-linolenic acid (GLA) and skin health:

The omega-6 fatty acid that acts like an omega-3 plays a role in the maintenance of a

healthy skin and coat.

### 6. *Vitamins:*

Because water- soluble vitamins are usually readily excreted if excess amounts are consumed, they are thought to be less likely to cause toxicity or side effects when ingested in large amounts. Fat soluble vitamins, except vitamin K, are stored to an appreciable extent in the body, and when ingested in large amounts over a period of time, toxic reactions may be observed, especially with vitamins A and D. There is importance of Vitamin C as it has involved following multiple function:

*i) Vitamin C and the immune system:* Prepares the newborn for good antibody production when the mother's passive immunity ceases, thus contributing to the development of the immune system. It helps the newborn protect itself against the ravages of infectious diseases such as bronchitis (kennel cough), and upper respiratory and blood diseases in cats. Mega doses of vitamin C aids in the production of interferon, and thus are beneficial in preventing and controlling feline leukemia and feline infectious peritonitis and now thought to be perhaps the greatest viral defender in the mammalian body.

*ii) Vitamin C and joint disorders:* Prevention of hip dysplasia by improving the dog's collagen production, which gives strength to ligaments, tendons, muscles and bones. It also enhances red blood cell production, is a natural detoxifier, helps increase appetite and growth, and also aids in good bone formation.

*iii) Vitamin C as nutritional antioxidant:* It is an aid to the prevention and treatment of stress nutrient related disease. In higher doses it aids in increasing stamina and endurance, increasing alertness and responsiveness, in minimizing stress and in the prevention of diseases.

Natural antioxidants (tocopherol, the nutrients of wheat germ, yeast, selenium, vitamin E, carotenoids etc.). Aid in the delay, stabilization, and prevention of oxidation of fatty substances in individual cells.

**B vitamins and pet health:** It is vital to the health of the nervous system, aids in proper utilization and absorption of fats, proteins, and carbohydrates.

### 7. Minerals:

A balance amount of the necessary dietary minerals in relation to the energy density of the diet is important. As intake of a mineral exceeds the requirement, an excessive amount may be absorbed, which may be detrimental, or a large amount of the unabsorbed mineral may prevent the absorption of adequate amounts of another mineral. Mineral deficiency is uncommon in well-balanced diets. Exceptions include diets rich in meat, which are therefore rich in phosphorus and poor in calcium; diets high in phytates or calcium (> 2.5% dry-matter basis), which inhibit absorption of trace minerals; and poor-quality foods with low digestibility and bioavailability.

### 8. Water:

Water is the most important nutrient. Essential to life, water accounts for between 60 to 70 percent of an adult dog's body weight. Pets need to have good quality water available at all times. Food may also help meet some of your pet's water needs. A dry pet food may contain up to 12 percent moisture, while a canned pet food may contain up to 85 percent moisture, so type of food consumed affects the water requirements. A deficiency of water may have serious repercussions for pets which may affect an animal's physical activity, reproduction, lactation, and growth.

### Diet Profile Ranges for Selected Physiological Conditions in Dogs (%DM)

Physiological Condition	Crude Protein	Crude Fat	Crude Fibre	Calcium*	Phosphorus*	Sodium
Growth/ Last third gestation/ Lactation	28-35	20-30	0-5	1.0-1.8	0.8-1.6	0.3-0.7
Maintenance adult	20-28	10-20	0-5	0.5-0.9	0.4-0.9	0.25-0.5
Sedentary Obesity	20-25	8-12	5-15	0.5-1.0	0.4-0.9	0.25-0.5
Old age	15-25	10-20	0-5	0.5-0.85	0.4-0.75	0.25-0.4
Work/ Stress/ Convalescence	25-30	25-30	0-5	0.7-1.4	0.7-1.4	0.3-0.7

\*Calcium : Phosphorus ratio should be between 1:1 and 2:1.

### FEEDING OF DOGS IN VARIOUS DISEASE CONDITIONS:

#### 1. Diarrhoea:

Diet plays an important role in the diarrhoeal condition. In addition to therapeutic measures, diet should have low fiber content and easily digestible protein source like curd and egg. Milk should not be given in such condition although milk products may be given. Electrolytes solution should be given. The nutritional intervention plays a key role in the successful management of gastrointestinal disease. SCFA have the potential to improve overall intestinal health, stimulate intestinal healing, and decrease intestinal inflammation (Hickman, 1998). Fibre and FOS in adult diets promote the growth of beneficial bacteria at the expense of detrimental ones since older dogs often have changes in the intestinal bacterial population which can result in clinical signs of gastrointestinal disease (e.g. diarrhoea) (Simpson, 1998; Topping and Clifton, 2001; Pasupathy *et al.*, 2002; Flickinger *et al.*, 2003).

Inulin and Fructo-oligosaccharides (FOS) are the newly discovered members of the carbohydrate family that act as probiotics. Fructo-oligosaccharides are readily fermentable and have been shown to increase butyrate production (Sunvold *et al.*, 1995). Butyrate is a preferred substrate for colonocytes and appears to promote a normal phenotype in these cells. In general, fructans (include short-chain fructo-oligosaccharides (scFOS), inulin, and hydrolyzed inulin) are thought to inhibit either the production of protein-fermentative end products (excreta odor components) or the bacterial populations that produce them (Gibson and Roberfroid, 1995; Swanson *et al.*, 2002). Low levels of supplemental fructans have divergent effects on nutrient digestibility and fermentative end products, but do not adversely affect nutrient digestibility or fecal characteristics and may improve colonic microbial ecology in dogs (Flickinger *et al.*, 2003). Arabinogalactan is a unique dietary fiber that affects the digestive physiology and immunological characteristics of

dogs (Grieshop *et al.*, 2002). They also observed increased white blood cell, neutrophil and eosinophil concentrations in response to specific forms and doses of arabinogalactan. Infective diarrhoea can be managed with feeding of probiotics- *Lactobacillus acidophilus* (Pashupathy *et al.*, 2001).

## **2. Vomiting:**

First of all control the causative agent. If vomiting continues, stop oral feeding and allow parental (intravenous) feeding which can provide all the nutrients. After one day, offer fresh light diet.

## **3. Fever:**

Fever increases the energy requirement. So, high energy bland diet should be given. In anorexic dog, tube feeding should be done. Protein supplementation is also recommended in fever.

## **4. Obesity:**

Butterwick and Hawthorne (1998) evaluated the potential benefit of insoluble and soluble dietary fiber on satiety in dogs that have been restricted to an energy intake appropriate for weight reduction. Fenugreek (*Trigonella foenum graecum*) and isolated fenugreek fractions have been shown to act as hypoglycaemic and hypocholesterolaemic agents in both animal and human studies (Madar and Stark, 2002). The unique dietary fibre composition and high saponin content in fenugreek appears to be responsible for these therapeutic properties. Mung beans (*Phaseolus aureus*, *Vigna radiatus*) are thought to be beneficial as an anti-diabetic, low glycaemic index food, rich in antioxidants. Weber *et al.*, (2007) observed a satiating effect as evidenced by reduced voluntary intake in high-protein high-fiber diet and suggested the diet type to have the potential to lead to greater compliance in weight-loss programs. Specialized nutrition therapy for obese patients currently consists of a hypocaloric, high-protein diet (Cave *et al.*, 2008).

## **5. Kidney diseases:**

In kidney diseases like renal insufficiency and urolithiasis, low protein diet with high biological value recommended. In

urolithiasis, a high percentage of common salt should be fed to increase water intake and urine volume.

## **6. Diabetes mellitus:**

A high protein diet is recommended. The fiber content should also be high. The sugar level in diet should be 10w. Quantity of skim milk, green vegetables and bran- enriched chapatti should be increased. A diet high in dietary fiber from whole plant foods can be advised because this has been related to lower risks of other chronic conditions such as heart disease and diabetes (Pereira *et al.*, 2004).

## **7. Cardiac insufficiency:**

In this condition fat should not be given to dog. Salt should not be supplemented.

## **8. Colorectal cancer:**

Dietary fiber has been hypothesized to reduce the risk of colorectal cancer. Potential mechanisms for a protective effect include dilution of fecal carcinogens and procarcinogens, reduction of transit time of feces through the bowel, production of short chain fatty acids, which promote anticarcinogenic action, and binding of carcinogenic bile acids (Lipkin *et al.*, 1999). A high dietary fiber intake may not have a major effect on the risk of colorectal cancer. Park *et al.*, (2005) observed a statistically significant inverse association between dietary fiber intake and risk of colorectal cancer in an age-adjusted analysis. There is use of functional foods/ nutraceuticals to reduce the risk of diseases and to enhance the quality of life. Inulin and oligofructans alter several biomarkers, including gastrointestinal transit time, colonic, caecal microflora, and neoplastic conditions (Sahoo, 2006).

## **9. Orthomolecular Nutrition:**

The nutritional approach involving therapeutic nutrients, which aims to restore the optimum environment of the body by correcting imbalances or deficiencies based on individual biochemistry using substances natural to the body such as vitamins, dietary minerals, proteins, antioxidants, amino acids, u-3 fatty acids, u-6 fatty acids, lipotropes, prohorrnones, dietary fiber and short and long chain fatty acids. It also holds the

hypothesis that such imbalances or deficiencies can be prevented, treated, or sometimes cured by achieving optimum bodily levels of these substances, either through diet or metabolism.

The orthomolecular field is based on research in biochemistry, nutrition, medicine, and pharmaceuticals, which is interpreted in the light of the clinical experience of its practitioners. Orthomolecular medicine and optimum nutrition are based on the idea of individual variation in animals/humans, with individual nutrient requirements varying widely with health, genetic and environmental influences (Williams, 1998). Based on investigational scientific studies, single blinded and double blinded randomized controlled trials, clinical experience, and case histories, claims have been made that therapeutic

nutrition can prevent (Moyad, 2007), treat, or sometimes cure, acne (Leung, 1997) bee sting, burns, cancer, common cold, drug addiction, drug overdose, heart diseases, acute hepatitis, herpes, influenza, mononucleosis, mushroom poisoning, neuropathy and polyneuritis (including Multiple sclerosis), osteoporosis (Plaza and Lamson), polio, alcoholism (Hoffer, *et al.*, 2005), allergies, arthritis, autism, epilepsy, hypertension, hypoglycemia, migraine, clinical depression, learning disabilities, retardation, mental and metabolic disorders, skin problems, and hyperactivity (Skillman, 1983). Raynaud's disease, heavy metal toxicity, radiation sickness, Pyroluria, schizophrenia (Skinner, 2004), shock, snakebite, spider bite, tetanus toxin and viral pneumonia (Kelner, 1971).



**Modified diet for sick dogs:**

Ingredients	
Amount (g)	
Cooked rice. gruel	
500	
Sugar	
60	
Paneer	(Cheese)
200	
Cream	
100	

Maize	oil
15	
Egg	
01/ 02	
Dicalcium	phosphate
10	
Potassium	phosphate
15	
Mineral/vitamin	supplement as required
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