

# CAT & DOG NUTRITION

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# INTRODUCTION

- Dogs and cats are fed with six nutrients
  - Water
  - Protein
  - Carbohydrate
  - Fats
  - Mineral
  - Vitamins

## Lactose intolerance

- Ability to digest lactose depends on the activity of  **$\beta$ -galactosidase** in the intestine.
- Activity of  $\beta$ -galactosidase is known to be **higher in kittens**
- In some of the adult dogs digestive disturbances observed with intake greater than **0.6-1 g lactose/kg BW/day** (equivalent to 10-20 ml milk/kg BW)
- Lactose content of bitch and queen milk is **3.7 & 4.9%** resp.

## Optimum crude fibre:

- Recommended levels of fibre in dogs and cats vary between **3.5-6.0%**
- Fibre absorb water and help in peristaltic movements of GI tract
- It also serves as an source of energy

## Essentiality of arachidonic acid for cats:

- Cats are having limited activity of **desaturase enzyme** involved in EFA's metabolism
- **Arachidonic acid is dietary essential** for cats therefore, they require animal fat
- Because of above given reason the cats are **obligate carnivores**.

## Taurine in cats

- **Taurine** is the eleventh essential AA required by cat
- All other species conjugate glycine with bile acids to form glycocholic acid
- Cats use taurine instead of glycine and form **taurocholic acid**
- Taurine found in muscles, retina and CNS which again makes cats as an obligate carnivores.

## **Calcium to phosphorus ratio**

- Desired Ca:P ratio in cats is 1:1 while, that for dogs are 1.4:1
- But the sources such as meat, poultry and fish supplies Ca:P of 1:15-20
- This may lead to Ca deficiency and causes NSH, Eclampsia (usually occurs in nursing mothers)

# NUTRIENT REQUIREMENT OF DOG AND CATS

<b>Nutrient</b>	<b>Dog</b>	<b>Cat</b>
Protein, g	22	28
Fat, g	5.5	9.0
Calcium, g	1.1	1.0
Phosphorus, g	0.9	0.8
Arachidonic acid, g	NR	0.02
Taurine, mg	NR	100

Values expressed as per 400 Kcal ME which is approx. present in 100 g DM in a typical commercial pet foods

Condition	ME Requirement per day
Maintenance	132 Kcal/kg $W^{0.75}$
Growing	264 Kcal/kg $W^{0.75}$
Adolescence	200 Kcal/kg $W^{0.75}$
Pregnancy	188 Kcal/kg $W^{0.75}$
Lactation	470 Kcal/kg $W^{0.75}$

## AAFCO Dog food

<b>Nutrient</b>	<b>Units on DMB</b>	<b>Growth and Reproduction</b>	<b>Maintenance Minimum</b>
Protein	%	22.0	18.0
Fat	%	8.0	5.0
Calcium	%	1.0	0.6
Phosphorus	%	0.8	0.5
Vitamin A	IU/kg	5000	5000
Vitamin D	IU/kg	500	500



## AAFCO Cat food

<b>Nutrient</b>	<b>Units on DMB</b>	<b>Growth and Reproduction</b>	<b>Maintenance Minimum</b>
Protein	%	30.0	26.0
Fat	%	9.0	9.0
Arachidonic acid	%	0.02	0.02
Calcium	%	1.0	0.6
Phosphorus	%	0.8	0.5
Vitamin A	IU/kg	9000	9000
Vitamin D	IU/kg	750	500
Taurine	%	0.10	0.10

# FEEDING OF DOGS

## Feeding during Pregnancy:

- Nutrient requirement of the female during the first 6-7 weeks of pregnancy are not higher than maintenance.
- In last 2-3 weeks requirement for all nutrient will increase
- Dogs eat more during this phase therefore, feed should be offered several times a day
- At the time near to whelping the bitch may lose its appetite but it returns after 24 hrs
- Fresh water in a clean bowl should be made available at all times near to her after whelping.

## Feeding during lactation

- Demand for milk by puppies will continue upto 20-30 days
- Food and water requirement increases 2-4 times above maintenance at peak lactation.
- Puppies start nibbling solid feed at 20 days of age
- Puppies are weaned between 6-8 weeks of age
- By this time the mothers food consumption should be reduced to 50% above her maintenance level
- To reduce the milk flow following procedure for weaning is recommended:

S.No.	Day	Procedure
1.	Day of weaning	No food only plenty of fresh water
2.	2 <sup>nd</sup> day	- 1/4 <sup>th</sup> the amount of food provided prior to bred - Left the Puppies so to nurse the dam for dry
3.	3 <sup>rd</sup> day	Dam shd receive 1/2 the amount fed prior to breeding
4.	4 <sup>th</sup> day	3/4 <sup>th</sup> the amount
5.	5 <sup>th</sup> day	Usual maintenance diet

If the litter size is large the body condition of dam become poor when the pups are weaned therefore, she shd be given extra feed after 5<sup>th</sup> day until the body condition returns to normal

## **Feeding of Pups:**

- First feed for a newborn pups is mothers milk
- After 7-10 days pups BW becomes doubles and they become active
- Lactation period in bitches last for 8 weeks but the dog breeders practice weaning at about 6-8 week of age
- If more than 8 pups are born at a time the litter should be reduced to eight at the end of 1<sup>st</sup> week
- And the bitch's milk is supplemented with cow milk after 3<sup>rd</sup> week
- For a litter of 8 pups about 600 ml of milk/day is sufficient for the first 3 days
- And after 3<sup>rd</sup> day quantity of milk shd be doubled i.e. 1.2 lit

## Milk Substitute (in 800 ml cow milk)

S.No.	Constituents	Amount
1.	Cream	200 g
2.	Egg Yolk	01
3.	Steamed bone meal	6.0 g
4.	Vitamin A	2000 IU
5.	Vitamin D	500 IU
6.	Citric Acid	4.0 g

## Feeding of Weaned Puppies:

- Liquid diet (30% DM) using cream, cereal flour, egg yolk, milk or milk powder
- This is fed @ 15% of BW at defined intervals
- Young pups are fed **thrice a day** while, after **4 months of age** it shd be given **twice daily** and **once a day** at **8 months of age** onwards
- Establishing a routine eating habits by feeding a pup at the same place and at the same time daily is recommended.
- Daily req. of pup is calculated @ 50-55 g DM/kg BW during the period of active growth or upto 6 month
- Thereafter the quantity may be reduced upto 38-40 g DM/kg BW

- At **6 wk of age** energy intake is **3 times** of adult requirement it gradually reduces to **2 times** at **20 wks of age** and further reduced to **normal maintenance** at **1 yr of age**
- Ralston Purina Co. (USA) Pups were fed 25% less than *ad-libitum*
  - Less hip displacia by 2 year of age
  - Less osteoarthritis in coxofemoral joint by 5 yr of age.



## **Feeding of Mature dogs:**

- Mature dogs ranges from 1-7 years of age
- Mature dogs has the lowest requirement
- But the feeding of mature dogs depends upon breed and activity

## Diets for Dogs

- Commercial dog foods are of three types dry, semi moist and canned foods.

### **Dry dog foods:**

- Moisture 10-12%, CP 18-27%, Fat 7-15% & Carbohydrate 35-50%

	<b>Products</b>
Cereal grains	Maize, Wheat, oats, barley
Cereal By products	Wheat Middlings, wheat germ meal, maize gluten meal,
Soyabean Products	Soyabean Meal, Soygrits,
Animal Products	Meat meal, meat and bone meal, meat by product, poultry by product,
Milk products	Dried skim milk, dried whey,
Fats and oils	Animal fat
Vitamin and minerals	Supplement

## TYPES OF DOG FOOD

- Prepared foods are some times fed to companion animals. The prepared food can be classified on the basis of its moisture percent.

They are

- Dry food (5-12%),
- Semi moist food (15-30%)
- Canned food (70-85%).

## Dry food

- Available as biscuits, mixtures and meal or flakes.
- May be complete food or complementary food,
- Generally rich in carbohydrates. Crude fat is 5-10% on dry basis.
- Mixtures are generally cereal based with very little protein concentrates may or may not be supplemented with minerals / vitamins.
  
- They have long shelf- life provided properly stored.
- The concentration of nutrients is high and feed intake is less.
- Digestibility is acceptable but less than semi-moist or canned foods.
- Energy content is high & dogs are well satisfied after eating.
  
- **Disadvantage** -they are much less palatable than moist foods. Cats may accept extruded biscuit forms but not meals or flakes.

## Semi-moist food

- **Has good digestibility (80-85%). Meat and vegetable protein are included.**
- **It is protected from spoilage with addition of glycerol or propylene glycol.**
- **Most acceptable to dogs and cats.**
- **Moisture content is generally 15 to 30%, can be stored for several months with reduced water activity.**
- **The low water activity is achieved by the inclusion in the recipes of humectants such as sugar, salt, propylene glycol or glucose which 'tie-up' the water.**
- **Meat, meat by-products, soya, vegetable protein concentrates, cereals, fats and sugars are used in these type of products.**

## **Canned food**

- **Most convenient to use, highly attractive for dogs and cat.**
- **Contain meat and meat products at varying levels.**
- **These food are reliable, safe and convenient to serve.**
- **Highly palatable, particularly when carbohydrate is less.**
- **Separate foods for dog and cat are available.**
- **Cat foods can be given to dogs but not vice-versa.**
- **Most canned foods are balanced foods.**
- **Digestibility is good.**
- **Nutrient density is low because of high moisture content. Generally not given as a sole food but given mixed with biscuits or mixtures.**
- **Safe, long shelf life. Meat, meat by-product, vegetable protein, cereals, are the main ingredients.**

## Home made foods

- **In developing countries like ours, feeding of companion animals with commercial foods are not popular for economic reasons.**
- **Pets are fed with home made foods or left overs of food consumed in a family. It is therefore essential to ensure that the dietary nutrient requirements are met through such feeding practice.**
- **Judicious inclusion of appropriate food items to supplement deficit nutrients in the home made or left over food can overcome nutritional deficiency disorders and support healthier life. The following is an example of home made food for dogs.**

# Example of home made food for dog

	<b>Body diet</b>		
	<b>20kg</b>	<b>25kg</b>	<b>30 kg</b>
<b>Egg</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Milk (ml)</b>	<b>200</b>	<b>250</b>	<b>300</b>
<b>Beef (g)</b>	<b>200</b>	<b>300</b>	<b>400</b>
<b>Rice (g)</b>	<b>150</b>	<b>200</b>	<b>200</b>
<b>Vitamin A, D</b>	<b>+</b>	<b>+</b>	<b>+</b>
<b>B complex</b>	<b>+</b>	<b>+</b>	<b>+</b>
<b>Salt iodized (g)</b>	<b>2.5</b>	<b>2.5</b>	<b>2.5</b>



## Classification of pet food based on the nutrient content

- ***Complete food***: Complete food is a food that provides all the nutrients required by the animal for 24 hours.
- ***Complementary food***: Complementary food is a food that provides only a part of the nutrients required by the animal for 24 hours and the rest is met from additional supplement.
- ***Mixer biscuit***: Mixer biscuit provides only essential nutrients.
- ***Snack / treat***: Snack / treat are foods to entertain / reward pet animals.