

Calculation of Nutrient requirement and balanced diets for Dog

A. Nutrient requirements

<u>I. ME Requirements (Kcal/kg W^{0.75}/day)</u>	
i. Maintenance	132
ii. Growing	264
iii. Adolescence	200
iv. Pregnancy	188
v. Lactation	470
<u>I. Fat Requirements (g/kg BW/day)</u>	
i. Maintenance	1.0
ii. Growing	2.7
<u>III. Protein Requirements (g/kg BW/day)</u>	
i. Maintenance	4.8
ii. Growing	9.6

B. Nutritive Value of some common foods

Foods	ME (kcal/100 g)	Protein (g/100 g)
Rice	345	6.80
Wheat	345	11.8
Ragi	328	7.30
Pulses	350	22.5
Soybean Meal	270	41.7
GNC(expeller)	260	40.9
GLV	050	4.25
Milk	067	3.20
Meat	194	18.5
Egg	143	11.3

C. Calculation of Nutrient Requirements

Problem1. Calculate ME, Fat and Protein requirements for a growing Labrador dog weighing 3 kg.

Solution: (i) ME requirement = $264\text{kcal}W^{0.75}$ per day
= $264 \times (3)^{0.75}$
= $264 \times \sqrt[3]{(3 \times 3 \times 3)}$
= $264 \times \sqrt[3]{(27)}$
= $264 \times \sqrt{(5.196)}$
= 264×2.279
= **601.79 Kcal/day**

(ii) Fat requirement = 2.7 g/kg BW
= 2.7×3.0

$$= 8.10 \text{ g/day}$$

$$\begin{aligned} \text{(iii) Protein requirement} &= 9.6 \text{ g/day} \\ &= 9.6 \times 3.0 \\ &= 28.8 \text{ g/day} \end{aligned}$$

Problem2. Calculate ME, Fat and Protein requirements for a growing German Shepherd dog having 7 kg body weight.

$$\begin{aligned} \text{Solution: (i) ME requirement} &= 264\text{kcal}W^{0.75} \text{ per day} \\ &= 264 \times (7)^{0.75} \\ &= 264 \times \sqrt[3]{(7 \times 7 \times 7)} \\ &= 264 \times \sqrt[3]{(343)} \\ &= 264 \times \sqrt{(18.520)} \\ &= 264 \times 4.30 \\ &= 1135.20 \text{ Kcal/day} \end{aligned}$$

$$\begin{aligned} \text{(ii) Fat requirement} &= 2.7 \text{ g/kg BW} \\ &= 2.7 \times 7.0 \\ &= 18.90 \text{ g/day} \end{aligned}$$

$$\begin{aligned} \text{(iii) Protein requirement} &= 9.6 \text{ g/day} \\ &= 9.6 \times 7.0 \\ &= 67.2 \text{ g/day} \end{aligned}$$

Problem3. Calculate ME, Fat and Protein requirements for an adult German Shepherd dog having 25 kg body weight.

$$\begin{aligned} \text{Solution: (i) ME requirement} &= 132\text{kcal}W^{0.75} \text{ per day} \\ &= 132 \times (25)^{0.75} \\ &= 132 \times \sqrt[3]{(25 \times 25 \times 25)} \\ &= 132 \times \sqrt[3]{(15625)} \\ &= 132 \times \sqrt{(125)} \\ &= 132 \times 11.18 \\ &= 1475.80 \text{ Kcal/day} \end{aligned}$$

$$\begin{aligned} \text{(ii) Fat requirement} &= 1.0 \text{ g/kg BW} \\ &= 1.0 \times 25.0 \\ &= 25.00 \text{ g/day} \end{aligned}$$

$$\begin{aligned} \text{(iii) Protein requirement} &= 4.8 \text{ g/day} \\ &= 4.8 \times 25.0 \\ &= 120.0 \text{ g/day} \end{aligned}$$

Problem4. Calculate ME, Fat and Protein requirements for an adult Great Dan dog having 45 kg body weight.

Solution: (i) ME requirement = $132\text{kcal}W^{0.75}$ per day
 $= 132 \times (45)^{0.75}$
 $= 132 \times \sqrt[3]{(45 \times 45 \times 45)}$
 $= 132 \times \sqrt[3]{(91125)}$
 $= 132 \times \sqrt[3]{(301.86)}$
 $= 132 \times 17.37$
 $= \mathbf{2293.40 \text{ Kcal/day}}$

(ii) Fat requirement = 1.0 g/kg BW
 $= 1.0 \times 45.0$
 $= \mathbf{45.00 \text{ g/day}}$

(iii) Protein requirement = 4.8 g/day
 $= 4.8 \times 45.0$
 $= \mathbf{216.0 \text{ g/day}}$

D. Feeding Schedule for Dogs: A Guide Chart

Body weight (kg)	Cereals (g)	Meat (g)	Milk (g)
2-5	100-220	50-100	125-150
5-10	200-300	100-200	150-250
10-20	300-500	200-400	250-400

Note: The **meat** portion of the diet may be completely replaced by including 1-2 eggs and pulses/oilseed meals [(soybean meal/GNC (expeller)]. Vegetables may be also be added to meet the requirement of fibre and micronutrients.

E. Balanced diets

Diet I

Diet II

Food Ingredients	Quantity (g)	ME (kcal)	Protein (g)	Food Ingredients	Quantity (g)	ME (kcal)	Protein (g)
NR, 3kg growing dog		602	28.8	NR, 3kg growing dog		602	28.8
Rice	75	259	5.10	Rice	100	345	6.80
Wheat	50	173	5.90	Milk	100	67	3.2
Pulses	25	88	5.60	Meat	100	194	18.5
GLV	50	25	2.13	Total		606	28.5
Milk	100	67	3.20				
Egg	50	71.5	5.65				
Total		683.0	27.6				

Note: Cooked well and add ¼ tsp salt+ 2tsp bone meal+ 1tsp vitamin& mineral mix and mix well.

Diet III

Food Ingredients	Quantity (g)	ME (kcal)	Protein (g)
NR, 10kg growing dog		1484	96
Rice/Wheat	150	517.5	10.20
Ragi	150	492.0	10.95
Soybean Meal	100	270.0	41.70
GNC (expeller)	50	130.0	20.45
Eggs	100	143.0	11.30
Total		1552.5	94.60

Note: To above diet add salt ¼ tsp+ bone meal 2 tsp+ vitamin mixture 1 tsp

Diet IV Balanced ration for BSF Dogs

Food Ingredients	Quantity (g)
Rice/Wheat	480
Dog biscuits	30
Vegetables, fresh	230
Meat dressed with bones	680
Total	

Note: Dogs are supplemented with calcium gluconate tables, multivitamin tablet and shark liver oil as per need.