

Nutrient Requirement and Feed Formulations for laboratory Animals

I. Guinea pig

Body weight: (i) Birth wt. 60-100 g (litter size 1-8)
(ii) Ave. Adult body wt. 500 g

Feed consumption: (i) Growing = 20-30 g/d
(ii) Adult + 30-50 g/d (7-8 % of BW)
(iii) Pregnant/lactating = 40-60 g/d

Requirement of compounded feed for Guinea pig (BIS requirement)

Characteristics	Requirement
Moisture, % Max.	10.0
CP%, Min.	22.0
EE%, Min.	4.0
CF % Max.	9.0 -14.0
Total ash %	9.0
AIA %, Max.	1.0
Ca %, Min.	1.2
P %, Min.	0.6
Vit C (mg/kg) Min.	200

Nutrient Requirement for growth of Guinea pig (NRC, 1995)

Characteristics	Requirement
Moisture, %	10.0
Protein %	15.0
Essential fatty acids %	0.13 – 0.4
Fibre %	15.0
Arginine %	0.12
Lysine %	0.84
Methionine %	0.6
Ca %	0.8
P %	0.4
Vit A (Retinol) mg/kg	6.6
Vit. D₃ mg/kg	0.025
Vit. E mg/kg	26.7
Vit C mg/kg	200
Biotin mg/kg	0.2
Choline mg/kg	1800
Folic acid mg/kg	3.0-6.0
Niacin mg/kg	10
Pantothenic acid mg/kg	20
Pyridoxine mg/kg	2.0-3.0
Riboflavin mg/kg	3.0
Thiamine mg/kg	2.0

Nutrient requirements are expressed on as fed basis for diets containing 2800-3500 kcal ME/kg.

Stock Diet for Guinea Pig (IVRI, Izatnagar)

Ingredients	Percentage (% , as fed)
Yellow maize*/barley	15.0
Gram	15.0
Ground nut cake	23.0
Fish meal/dry skim milk powder	10.0
Wheat bran	36.0
Salt	0.5
Mineral mixture [^]	0.5
Vitamin premix	**
Total	100.0

*Cereal grains are ground. If gram is not available, in its place yellow maize or barley may be substituted

**To 100 kg of stock diet, 10 mg of vitamin A+B2 may be given. In addition 6 mg of ascorbic acid and 0.15 mg of vitamin E may be given per animal per day

[^]The mineral mixture recommended for poultry may be used

Natural Ingredient Diet used for Guinea Pig at National Institute of Health USA

Ingredients	Amount (g/kg)
α - α leaf meal (17% protein)	350.00
Soybean meal (49% protein)	120.00
Ground whole oats	252.50
Ground whole wheat	236.00
Soybean oil	15.00
Di calcium phosphate	5.00
Calcium carbonate	10.00
Salt	7.50
Mineral and Vitamin	4.00
Total	1000.00

II. Rat and Mice

- Body weight: (i) Birth weight = 4 - 5 g
(ii) Wt. of adult Male= about 200 g
(iii) Wt. of adult female = about 190 g

Feed consumption:

- (i) Growing = 15 g/d
(ii) Adult = 15-20 g/d
(iii) Pregnant/ lactating = 30 -40 g/d

Requirement of Compounded Feed for Laboratory Mice and Rats (BIS)

Characteristics	Requirement
Moisture, % (Max.) by weight	10
CP, % (Min.) by weight	24
EE, % (Min.) by weight	5
CF, % (Max.) by weight	6
Total ash, % (Max.) by weight	9
AIA, % (Max.) by weight	1
Ca, % (Min.) by weight	0.6
Available P, % (Min.) by weight	0.3
Tryptophan, %(Min.) by weight	0.2
L- lysine, %(Min.) by weight	1.0
Methionine + lysine, % (Min.) by weight	0.8
L – Arginine, % (Min.) by weight	0.2
EAA, % (Min.) by weight	0.2
VitA, IU/kg (Min.)	2700
Vit D, IU/kg (Min.)	200
Vit E, mg/kg (Min.)	40
Vit B ₁₂ , mg/kg (Min.)	6
Calcium d-Pentothenate, mg/kg (Min.)	20
Nicotinic acid, mg /kg(Min.)	60
Vit B ₁ , mg/kg(Min.)	10
Choline, mg/kg (Min.)	1100

Nutrient Requirement for Maintenance, Growth and Reproduction of Rats (NRC, 1995)

Characteristics	Maintenance	Growth	Reproduction (female)
Moisture %	10	10	10.0
Protein %	5	15	15
Linoleic acid %	0.6	0.6	0.6
Arginine %	ND	0.43	0.43
Lysine %	0.11	0.92	0.92
Methionine+cystine %	0.23	0.98	0.98
Ca %	ND	0.50	0.63
P %	ND	0.30	0.37
Vit A (Retinol) mg/kg	ND	0.70	0.70
Vit. D ₃ mg/kg	ND	0.025	0.025
Vit. E mg/kg	ND	18	18
Biotin mg/kg	ND	0.2	0.2
Choline mg/kg	ND	750	750
Folic acid mg/kg	ND	1.0	1.0
Niacin mg/kg	ND	15.0	15.0
Pantothenic acid mg/kg	ND	10.0	10.0
Pyridoxine mg/kg	ND	6.0	6.0
Riboflavin mg/kg	ND	3.0	4.0
Thiamine mg/kg	ND	4.0	4.0
Vit. B ₁₂ (mg/kg)	ND	50.0	50.0

Nutrient requirements are expressed on as fed basis for diets containing 3800-4100 kcal ME/kg.

Stock diet for Mouse and Rat (IVRI, Izatnagar)

Ingredients	Percentage (% , as fed)
Whole wheat flour	30.0
Gram flour*	20.0
Maize flour	30.0
Dried whole milk powder**	10.0
Wheat bran	8.5
Mineral mixture	1.0
Salt	0.5
Vitamins	^
Total	100.0

*If gram flour is not available then an equal amount of any of cereal grains like maize/barley may be used

** If dried whole milk powder is not available, then it may be substituted with decorticated GNC. In this situation 15 ml of skimmed or 1.0 g of dry skim milk powder per animal per day may be fed. Fishmeal may also be substituted in place of skim milk powder.

^Stabilized vitamin AB₂D₃ and vitamin E as per the specification of the brand name

Purified Diet for Rat and Mice

Ingredients	Percentage (%)
Sucrose	50.0
Corn starch	15.0
Casein	20.0
Corn oil	5.0
Cellulose	5.0
Min mixture	3.5
Vit. mixture	1.0
Methionine	0.3
Choline	0.2
Total	100.0

Natural Ingredient Diet for Rat and Mouse (NIH, USA)

Ingredients	Percentage (%)
Animal protein	15.00% { Dry skimmed milk - 5% Fish meal (60 % protein) -10%
Vegetable protein	15.00% { Soybean meal (48 % protein)-12% Corn gluten meal (60 % protein)- 3%
Alfalfa meal, dehydrated (17 % protein)	4.00 %
Grain mixture	57.50% { Ground Maize 24.5 % + ground whole oats 10 % Ground wheat -23 %
CHO source	3.50% { Brewers yeast – 2.0% Dry molasses – 1.5%
Soybean oil	2.50
Salt	0.50
DCP	1.25
Lime stone	0.50
Min mixture	0.12
Vit. mixture	0.13
Total	100.00

III. Rabbit

Amount of feed consumption

Age (in days)	Food (g/d)
Birth to 15 d	0.0
15 -21 d	0-20
21-35 d	20-50
35-42 d	40-80
42-49 d	70-110
49-63 d	100 - 160

Nutrient Requirement of Rabbit

Nutrient	Maintenance	Gestation	Growth	Lactation
DE (Kcal/kg)	2100	2500	2500	2500
CP (%)	12	15	16	17
DCP (%)	9	11	12	13
TDN (%)	55	58	65	70
CP (%)	14	10-12	10-12	10-12
Fat (%)	2	2	2	2

Stock Diet for Rabbit (IVRI, Izatnagar)

Ingredients	Percentage (%)
Ground Yellow maize.barley	30
GNC (Decorticated)	15
Wheat bran	53
Salt	01
Mineral mixture	01
Total	100

Ration schedule: Good quality hay 40-60 %; concentrate mixture 50-60 %

Natural Ingredient of Diet for Rabbit

Ingredients	Percentage (%)
Fish meal	9.0
Soybean meal	5.0
α - α meal	2.0
Corn gluten meal	2.0
Ground yellow corn	21.0
Ground whole wheat	35.5
Oat	10.0
Wheat	10.0
Brewer's yeast	1.0
Soybean oil	1.5
Salt	0.5
DCP	1.5
Lime stone	0.5
Min+ Vit. mixture	0.5 (0.25 +0.25)
Total	100.0

Some Complete Diets for Rabbit

Feed stuff	Grower	Maintenance diets		
		1.	2.	3.
Cowpea hay	30.0	50.0	50.0	50.0
Maize grain	28.0	10.0	10.0	-
DORB	25.0	33.0	38.0	46.0
GNC (expeller)	15.0	5.0	-	2.0
Min mixture	1.5	1.5	1.5	1.5
Salt	0.5	0.5	0.5	0.5
Total	100.0	100.0	100.0	100.0
CP (%)	16.6	14.0	12.3	13.00
TDN (%)	60.0	65.0	63.5	62.24

In addition to the Ca, P, Mg, Na, K, Cl, Fe, Zn, Ca, Mn, Cu, I and Se synthetic fat soluble vit A, D, E and B₃ added.

Laboratory Rabbit

Ingredients	Percentage (%)
α - α hay	40.0
Wheat grain	25.0
Sorghum grain	22.5
Soybean meal	12.0
Salt	0.5
Total (Roughage: Concentrate = 40:60)	100.0

Diet for rabbit

1] Young Rabbit (0.5 - 4kg Body wt)

Ingredients	Percentage (%)
<i>α-α</i> hay	50.0
Maize grain	23.5
Barley grain	11.0
Wheat bran	5.0
Soybean meal	10.0
Salt	0.5
Total	100.0

2] Adult Rabbit

Ingredients	Percentage (%)
Clover hay	70.0
Oat grain	29.5
Salt	0.5
Total	100.0

3] Pregnant Rabbit

Ingredients	Percentage (%)
<i>α-α</i> hay	50.0
Oat grain	45.5
Soybean meal	4.0
Salt	0.5
Total	100.0

Purified Diet for Rabbits

Ingredients	Percentage (%)
Isolated Soya protein	20.0
Purified cellulose	16.0
Corn oil	5.0
Min. mixture	6.6
Vitamin mix	0.2
Corn dextrin	5.0
Corn starch	27.4
Glucose	15.0
Water	5.0
Total	100.0