

Standard Guidelines for Feeding of Captive Animals in Indian Zoos

General guidelines for feeding of herbivores

1. The proportion of concentrates in the diet should be restricted to 25-30% on DM basis. In no case, it should exceed 30% of the total diet on DM basis.
 - i. Concentrates may be used as a vehicle for supplementation of minerals and other micronutrients.
 - ii. Concentrate mixture should be supplemented with a balance mineral mixture @ 2 %.
 - iii. Composition of model concentrate mixture using different ingredients are detailed in Appendix I. Composition of balance mineral mixture is detailed in Appendix II & III.
2. Fruits and vegetables are not recommended.
3. To avoid overfeeding/underfeeding concentrate feed should be offered in different feeding stations inside the enclosure.
4. Many zoos feed green fodder *ad-lib*. Restricting the amount of concentrates and fodder would not only be economical, but will also reduce the refusals.

1. Spotted Deer

- Basal diet of spotted deer should be comprised of good quality green fodder. Best combination would be a leguminous fodder and a cereal fodder fed in equal proportion on DM basis.
- **A typical diet for an adult weighing 70 kg**

Ingredients	Quantity (kg)
Berseem/ any other leguminous fodder (Containing, DM-20%)	3.5
Oat/ any other cereal fodder (Containing, DM- 25%)	3.0
Standard concentrate mixture (Appendix. I) (CP 16% and GE 3940 kcal/kg)	0.5

Note: Actual amount of forage to be fed should be decided depending upon the DM of the forage and body weight of the animals. Further it would be desirable to perform nutrient analysis of different feed ingredients on regular basis.

- Spotted deer are mixed fodder. Grasses, legumes and browses may all be fed to them depending upon the availability. However, feed only that fodder and browses which are known not to contain any toxicant.

2. One horned Rhinoceros

- A typical diet for a female rhinoceros weighing 1600kg

Ingredients	Quantity (kg)
Green fodder	110.0
Concentrates	2.0

- A typical diet for a male rhinoceros weighing 2200kg

Ingredients	Quantity (Kg)
Green fodder	150.0
Concentrates*	3.0

Note: *Concentrate should not provide more than 30% of the dietary energy. Compound cattle feed may be used for the feeding rhinoceros. Concentrate ingredients should be supplemented with a good quality mineral mixture @ 2 % on dry matter basis (Please see appendix II & III).

- Growing animals require more protein in their diet, hence the proportion of concentrate may be increased in their diet up to 25-30% and following feeding schedule may be practiced:

Body weight • F (kg)	Green fodder (having 25% DM) Kg	Concentrate (having 90%DM) Kg
e 750	65.0	4.0
e 1000	80.0	5.0
d 1600	110.0	2.0
i 2200	150.0	3.0

- Feeding of fruits and vegetables are not nutritionally important. If fed they must not contribute more than 2% of diet on dry matter basis.
- Food should not be offered on ground. Sand colic has been reported in Indian rhinoceros. They should be either fed on sturdy trough or on concrete pads.

- To reduce competition, it would be desirable to feed them individually (at least concentrate portion). Food may be offered in different stations, if the animals are kept in a group. It also acts as a measure of behavioural enrichment.
- Feeding of excessive leguminous fodder should not be encouraged.

3. Gaur

- A typical diet for an adult male gaur

Ingredients	Quantity (kg)
Green fodder	15.0
Ground nut cake	0.5
Horse gram	1.0
Wheat bran	3.0
Hay	5.0

To the above ration give 20 g common salt.

- Note:**
1. The above diet found to be adequate to fulfill requirement of energy, protein Ca, P, Fe, Cu and Zn. Trace element mixture may be added to the concentrates for better Performance (see Appendix III).
 2. It has been seen that vitamin E requirement of captive animals are higher than those of free range animals. So, the part of concentrate should contain germinating pulses.

4. Wild pig

- A typical diet for an adult sow

Ingredients	Quantity (kg)
Mash	0.600
Green fodder	0.700
Tubers	0.300
Vegetables	0.200

- **A typical diet for an adult boar**

Ingredients	Quantity (kg)
Mash	1.00
Green fodder	0.25
Tubers	0.50
Vegetables	0.50

Note: Mash should be coarsely ground. Cotton seed meal should never be fed to pigs as they are highly susceptible to gossypol poisoning. Milk of sow deficient in iron and copper. Piglets are prone to anemia. A dose of copper and iron (Impheron) may be given on fourth and fourteenth day of birth to piglets.

5. Asian elephant

- Fruits and vegetables are not required in the diet of captive Asian elephant. Concentrates should not be fed as the first meal of the day. The meal of day may be cultivated cereal fodder. Concentrates should be fed during noon/after noon. High moisture feed may be fed at any time, particularly during night.
- Growing animals require more protein in their diet. Hence the proportion of concentrate may be increased in their diet up to 25-30%. A typical concentrate mixture for sub adult should include pulse and cereals in 2:1 ratio. Concentrate should be supplemented with 100g of common salt and 30g of rock salt. Trace element mixture could be added @1.2 g/kg of concentrate on DM basis. For adult elephants the ratio of pulses: cereals could be just reverse at 1:2. The following schedule may be practiced:

Body weight (kg)	Green fodder (kg) (having 25% DM)	Concentrates (kg) (having 90%DM)
500	35.0	3.0
1000	70.0	4.0
1500	90.0	5.0
2500	135.0	5.0
3000	165.0	5.0
3500	200.0	5.5
4000	225.0	6.0

- Roughage vary considerably in their moisture content (Reed grass, banana stem, contain more than 90% , dal grass, paragrass contain 80-85%, cultivated fodder contain 75-80% , tree fodder contain less than 70%, whereas hay and straw contain less 10%. It is thus obvious that the amount of roughage depend on the types of foddors and their combination. The basic target is to restrict total dry matter intake to 1-1.25% of body weight in adult and ensure dry matter intake of 1.5-2.0% of body weight in sub adult. The proportion of concentrate ingredients could be as low as 10% of total dry matter in adult where as it could be up to 30% of total dry matter intake in sub adult.
- Elephants are very prone to obesity. Body condition should be regularly monitored; grasses should be the main component of elephant diet. Some amount of leguminous fodder may be included in the diet of young animals to increase the protein content of the diet. High moisture roughages like reed grass and banana stems may be fed *ad lib*. Other roughages and concentrates should be restricted.
- Some amount (10-20% of total diet on dry matter basis) of browses may be added in the diet. Depending on availability following different types of feed may be fed to captive Asiatic elephant weighing 3000 kg.

Combination	Cereal fodder (having 25 % DM) Kg	Tree leaves (having 35% DM) Kg	High moisture fodder (having 10%DM) Kg	Concentrate (having 90% DM) Kg
Cereal fodder alone	165	-	-	5.0
Cereal +tree fodder	110	48	-	5.0
Cereal + high moisture fodder	100	-	130	5.0
Cereal + high moisture fodder + tree fodder	55	45	110	5.0

General guidelines for feeding of omnivores

1. Wild fruits are different in nutrient composition than cultivated fruits. Cultivated fruits contain more sugar, less fiber and less calcium than wild fruits, thus it may not always be correct to feed them large quantity of cultivated fruits.
2. To meet Ca requirement of these fruit eating animals is the most difficult task.
3. Feed large quantity of green leafy vegetables to them.
4. When the animals are fed in a group, the basic idea is to provide adequate nutrition to the weakest one .This approach however may cause obesity to the dominant members of the group. Food may be scattered around the enclosure so that every member of this group has access to food.
5. Obesity should be closely monitored.
6. Nuts may be given as a treat, not as a routine food.
7. Do not feed the same fruit or vegetable every day. Variation in desirable.
8. Calcium supplement may be added to the concentrate portion of the diet.

1. Rhesus macaque

- **A typical diet for an adult Rhesus macaque:** An adult Rhesus monkey should be fed about 800 g fresh food.

Ingredients	Quantity (g)
Vegetables	400
Fruits	300
Cooked/processed cereals	100

Time of the day	Type and amount of feed to be fed
Morning	50g processed cereals (bread/rice/roti) + 25g of seeds (sunflower/peanuts with hulls) + 100g of soaked bengal gram or germinating pulses
Noon	200 g leafy vegetables + 100g soft fruits (banana)
Afternoon	200g vegetables (carrot, cabbage, beans) + 100g fruits (apple/pear/seasonal fruits), + 25g tubers

- At least 3 meals may be provided in a day.
- Browse should be added in the diet.
- Behavioural enrichment could be provided by supplying food in puzzle box, wire ball and innovative devices.

2. Common Langurs

- A typical diet for an adult common langurs

Ingredients	Quantity (g)
Bread	50
Tubers	50
Apple	100
Pears/Guava and other fruits	100
Sprouted pulses	50
Soaked gram	100
Mixed vegetables (Cabbage/carrot/beans)	300
Leafy vegetables	200
Okra	50
Browsers with young leaves <i>ad-lib</i>.	400 (At least)

Note: green leafy vegetables or browsers with young leaves, buds and even flower may be fed *ad lib*. Peanuts or any other nuts or seeds should not be fed regularly. They can be given as treat.

General guidelines for feeding of carnivores

1. Order carnivore includes many species of animal with diversified food habit. This generalization is limited to largely meat eating species.
2. Muscle meat is deficient in calcium. However, if bones are regularly chewed problem of metabolic bone diseases can be easily averted.
3. Do not feed eggs, milk etc to obligate carnivores. If you are intended to improve vitamin supply then go straight for a vitamin supplement.
4. Liver can be used as supplement. Because of a lot of hygienic issues are involved in feeding liver. It is generally preferable to supplement diet with vitamins.
5. Smaller felids, growing animals and lactating mothers do not require an off day.
6. Freezing and thawing the meat before feeding is helpful in reducing parasitic load.
7. Strict code of hygiene should be maintained at all time.

1. Jackal

1. Feeding of 1kg of meat is adequate for male and 750g of meat is adequate for a female.
2. Variation could be provided by supplying equal amount of chicken in place of meat.
3. In nature, they prey on rodents, smaller vertebrates and also eat fruits and tubers. Therefore, fruits and tubers should be added in the diet.
4. Ensure that bone piece is attached to the chunk offered.
5. In nature, they have to take a number of meals in a day. Fasting is really not required.

2. Tiger

- Constant monitoring of captive diet is required. A tiger must be fed according to its body size, physiological status, any special requirement, and health. It is emphasized that the following suggestion should be better treated as general guidelines.
- The following feeding schedule is suggested:

Description of animals	Type of meat	Amount of meat (kg/d)	Supplements	Frequency of feeding
Average sized male	Beef/ buffalo meat	8	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week
Average sized female	Beef/ buffalo meat	6	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week

Note: (i) Boneless meat requires supplementation with 7-10g of CaCO₃. Each kg of fresh meat should be supplemented with 3000 IU of vitamin A and 150 IU of vitamin-D.

(ii) Feeding meat with bones provides great source of behavioural enrichment to tiger as it stimulate natural feeding behaviour of tiger, the chunk should be cut in a manner that the requisite quota of an animal could be provided in a singular piece.

(iii) Lactating animals do not require any off day. If possible her quota of meat should be spread over several meals; amount of meat could be increased by 10-20% during severe cold.

(iv) Use of liver, eggs and milk as a supplementary source of minerals and vitamins should not be encouraged. It is safer to use commercial vitamin supplements.

(v) Further behavioural enrichment may be provided by keeping meat in gunny bags suspended from roof of the enclosure; concealing the meat inside the enclosure or by simply keeping the chunk in a bag tightly secured with ropes.

(vi) Meat should be provided as late as possible. Indore zoo fed their tigers at night. This is tremendous source of behavioural stimulation and also good for maintaining general hygiene.

(vii) Feeding of chicken is not necessary under normal circumstances, however it can be given in a particular animal which refuses to chew bones.

(viii) Amount of meat may be increased by 10-20 % during severe cold.

3. Asiatic Lion

- The following feeding schedule may be suggested for a lion and lioness

Description of animals	Type of meat	Amount of meat (kg/d)	Supplements	Frequency of feeding
Average sized male	Beef/ buffalo meat	6.75	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week
Average sized female	Beef/ buffalo meat	5.0	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week

Note: Similar as described for tiger

4. Leopard

All animals should be fed according to the body size. An average male should be fed 2.5 kg of meat, whereas 2kg of meat should be fed to an average sized female.

Description of animals	Type of meat	Amount of meat (kg/d)	Supplement	Frequency of feeding
Average sized male	Beef/ buffalo meat	2.5	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week
Average sized female	Beef/ buffalo meat	2.0	3000 IU of vitamin A and 150 IU of vitamin E per kg meat	6 times per week

Note: (i) Boneless meat requires supplementation with 7-10 g of CaCO₃ / kg of fresh meat.

(ii) During cold winter amount of meat may be increased by 20%.

(iii) Growing and pregnant animals may be fed ad lib without any off-day.

- (iv) Chicken may be given to bring variety in the diet on once or twice a week.
- (v) Provide 1500 IU of vitamin E and 150 IU of vitamin D in every kg of fresh meat, if liver is fed as a part of diet, this supplement may not be necessary. However, it is preferable to use vitamin supplement than liver.

5. Himalayan black bear

- A typical diet for an adult Himalayan black bear weighing 95kg

Ingredients	Quantity (g)
Cereals	400
pulses	200
High protein high calcium vegetables (Spinach, beans, cabbage and small amount of seasonal fruits)	1200
Jaggery	45
Milk and yoghurt	1000
Honey	15

Note:

- (i) Above ration should be supplemented with 30 g of balanced mineral mixture.
- (ii) Soft food items should be fed first followed by hard roughages. This will ensure cleaning of tooth and better dental health.
- (iii) Behavioural enrichment may be provided by spreading the honey on utensil, suspending the food from the roof of the enclosure, by keeping the fruits and vegetable in a gunny bag and any other innovative way that may suit the local condition.

Other Zoo Animals

1. Pea fowl

- A typical diet for an adult pea fowl for maintenance

Ingredients	Quantity (g)
Green leafy vegetables	100
Coloured vegetables (Carrot/ capsicum/ tomato)	50
Garlic	5
Onion	50
Boiled egg/ insects	25
Poultry mash	100
Grain (Jowar, Bajra)	100

- For breeding birds

Ingredients	Quantity (%)
Layer ration	25
Green leaves	15
Wheat grain	10
Paddy grain	10
Mixed (preferably coloured) vegetables	5
Soya bean meal	15
Egg/Insects	15
Lime grit	3.5
Mineral vitamin premix	1.5
Garlic	5g/bird
Onion	50g/bird

Note:

- (i) All these ingredients should be made into a blend and fed to the birds @ 300-350g/ bird/day depending on the size of birds. Access to water and feed should be provided as soon as possible after hatching. However, all newly hatch chick should be given access to clean cool water 1-2 hours prior to the introduction of feed.
- (ii) Young chicks generally have a higher requirement for protein than adult birds; a 28-30% protein turkey starter feed (very fine crumble form) will usually provide a balanced nutrition for newly hatched chicks.
- (iii) During the five to ten weeks of life, peafowl chick should be fed only the high protein starter feed. Grain, high quality fresh grass and legumes may be introduced gradually at eight to ten weeks of age. Start with an evening feeding of grain and give only a small amount that the birds will consume without wastage. Supply smaller size grit in a separate feeder when whole grain and other green supplements are fed.
- (iv) Nutritional requirement of peafowl change at breeding time. For good hatchability and fertility, a high quality breeder ration should be fed. Breeder ration should be introduced at least one month before the breeding season is expected to start.
- (v) Provide plenty of feeder space (3-4 inches per bird). Do not offer feed on ground or on the litter. This could lead to eating litter which can have disastrous results. Keep the height of the feeder at about the level of the birds back. When changing feeder and watering equipment do so gradually, otherwise, the birds may not recognize new equipments and starve to death.

2. Gharial

- Following feeding schedule may be followed

Body weight of the animal (kg)	Type of feed	Amount of feed (g/d)	Supplement	Frequency of feeding
100	Fish	750	Not required	Daily
150	Fish	1000	Not required	Daily
200	Fish	1250	Not required	Daily
100	Fish	1750	Not required	Thrice a week
150	Fish	2300	Not required	Thrice a week
200	Fish	2950	Not required	Thrice a week

Note: Frozen fish should not be fed. Live fish can be fed sometimes for behavioural stimulation. If compelled to feed frozen fish, and then add 25-30mg thiamin and 1000 IU of vitamin E to each kg of feed.

Appendix I: Model composition of concentrate mixture for captive Ruminants

Ingredients	CM1	CM2	CM3	CM4	NZP	NKBP
Maize	47	30	-	25	13	-
Barley	-	-	-	-	16	-
Oat	-	-	-	-	8	-
Wheat	-	17	-	-	-	-
Bajra	-	-	25	-	-	-
Jowar	-	-	22	-	-	-
Ragi	-	-	47	20	-	20
Wheat bran	35	-	34	-	22	10
Rice bran	-	25	-	25	-	24
Groundnut cake	-	15	-	15	-	19
Gram chuni	-	10	-	12	-	-
Soyabean meal	15	-	16	-	-	-
Horse gram	-	-	-	-	12	25
Turmeric powder	-	-	-	-	1	-
Mineral mixture	2	2	2	2	1	1
Common salt	1	1	1	1	1	1
Calculated nutrient content						
CP (%)	16.35	16.71	16.34	16.20	18.26	20.13
TDN (%)	70.75	70.43	70.76	68.55	66.41	65.94

CM1, concentrate formulation1; CM2, concentrate formulation 2; CM3, concentrate formulation; CM4, concentrate formulation; NZP, concentrate mixture of national zoological park, Delhi; NKBP, concentrate mixture of Nandankanan biological park, Bhubaneswar ; CP, crude protein; TDN, Total digestible nutrients.

Appendix II: Model composition of mineral mixture for captive herbivores

Ingredients	Amounts (g)
Di –calcium phosphate	706.00
Limestone	712.00
Magnesium sulfate	61.58
Cobalt sulfate	4.71
Cobalt chloride	0.60
Ferrous sulfate	7.44
Zinc sulfate	42.40
Potassium iodide	0.40
Manganese sulfate	4.61
Sodium selenite	0.26

Twenty gram of above mineral mixture may be added to each kg of compounded concentrate mixture.

Appendix III: Model composition of trace mineral mixture for captive herbivores

Ingredients	Amounts (g)
Cobalt sulfate	7.78
Cobalt chloride	0.99
Ferrous sulfate	12.28
Zinc sulfate	70.27
Potassium iodide	0.66
Manganese sulfate	7.59
Sodium selenite	0.43

Accurately weighted amount of 1.2 g trace element mixture may be added to each kg of feed

**Appendix IV: Model composition of trace concentrate mixture for captive granivorous birds
during breeding and laying period**

Ingredients	BM1	BM2	BM3	BM4	BM5
Maize	25	-	-	-	-
Wheat	20	20	10	-	30
Broken rice	-	-	10	-	-
Bajra	-	-	21	16	10
Jowar	-	20	25	25	25
Ragi	21	26	-	26	-
Ground nut cake	-	13	12	13	10
Soyabean meal	28	15	16	15	18
Horse gram	-	-	-	-	-
Limestone	4.85	4.85	4.85	4.85	4.85
Di-calcium phosphate	0.70	0.70	0.70	0.70	0.70
Trace element mixture	0.20	0.20	0.20	0.20	0.20
Choline chloride	0.10	0.10	0.10	0.10	0.10
Coccidiostat	0.05	0.05	0.05	0.05	0.05
Calculated nutrient content					
CP%	18.74	18.30	18.75	18.62	18.85
ME (kcal/kg DM)	2667	2651	2668	2633	2688

BM1, Bird mash formulation 1; BM2, Bird mash formulation 2; BM3, Bird mash Formulation 3; BM4, Bird mash formulation 4; BM5, Bird mash formulation 5; CP, Crude protein; ME, Metabolizable energy (kcal/kg DM), (Calculated on the basis of ME value form poultry)

Appendix V: Model composition of concentrate mixture for captive granivorous birds for maintenance

<u>Ingredients</u>	BM1	BM2	BM3	BM4
Maize	40	20	30	-
Wheat	26	-	17	-
Broken rice	-	10	-	-
Bajra	-	-	-	-
Jowar	-	20	-	15
Ragi	-	25	20	50
Wheat bran	10	-	-	-
Rice bran	-	-	7	10
Soyabean meal	20	23	23	23
Horse gram	-	-	-	-
Limestone	1.15	1.15	1.15	1.15
Di-calcium phosphate	0.50	0.50	0.50	0.50
Trace element mixture	0.20	0.20	0.20	0.20
Choline chloride	0.10	0.10	0.10	0.10
Coccidiostat	0.05	0.05	0.05	0.05
Calculated nutrient content				
CP%	18.55	17.54	18.57	17.82
ME (kcal/kg DM)	2722	2822	2755	2693

BM1, Bird mash formulation 1; BM2, Bird mash formulation 2; BM3, Bird mash formulation 3; BM4, Bird mash formulation 4; CP, Crude protein; ME, Metabolizable energy (kcal/kg DM), (Calculated on the basis of ME value for poultry)

Appendix VI: Model composition of trace mixture and vitamin mixture for pheasants and other granivorous birds

Ingredients	Amount
Magnesium sulfate	6.15g
Copper sulfate	0.0392g
Ferrous sulfate	0.4464g
Zinc sulfate	0.3533g
Potassium iodide	0.0004g
Manganese sulfate	0.2146g
Sodium selenite (Na ₂ SeO ₃ .5H ₂ O)	0.6896g
Vitamin-A	5000 IU
Vitamin-D	1200 ICU
Choline-Cl	2000 mg
Riboflavin	4 mg
Pantothenic acid	12 mg
Vitamin-B12	0.012mg
Folic acid	1mg
Niacin	80 mg
Biotin	0.25 mg
Vitamin-K	1.5 mg
Thiamin	2.5 mg
Vitamin-E	15 IU
Pyridoxin	5mg

This mixture should be mixed to each one kg of bird mash

Model composition of commonly used feedstuffs in Indian Zoo/ wild animals

Feedstuffs	DM (%)	CP (%)	GE (kcal/kg)	Ca (%)	P (%)	Fe (ppm)	Zn (ppm)	Cu (ppm)	Fat (%)
Cereal grains									
Maize	90.42	8.45	4000	0.05	0.28	54.3	-	-	-
Bajra	92.04	11.42	3685	0.09	0.49	-	-	-	-
Roti	61.14	12.47	4080	0.12	0.98	65	15	29	
Oat	89.40	9.9	4040	0.09	0.38	55	22	11	
Rice	92.40	8.4	4120	0.08	0.32	68	18	9	
Barley	91.43	11.23	4000	0.12	0.58	50	7	40	
Jowar	91.42	11.43	4004	0.14	0.54	28	11	32	
Bread	58.22	12.34	4210	0.12	0.41	67	21	9	
Ragi	25.11	14.03	4010	0.12	0.85	65	15	29	
Sattu	62.58	32.45	3900	0.12	0.27	-	-	-	
Legumes									
Gram	51.84	26.54	3900	0.49	0.38	77	12	55	
Soaked gram	51.24	26.25	3910	0.55	0.37	78	51	12	
Peanut	58.14	19.80	5510	0.39	0.27	75	68	11	
Horse gram	91.25	26.25	4150	0.38	0.49	38	48	12	
Black gram	90.45	27.45	4140	0.31	0.62	70	68	14	
Green gram	48.48	24.23	3900	0.18	0.47	58	15	69	
Sprouted green gram	39.14	28.14	3740	0.45	0.51	68	12	55	
Soaked Bengal gram	51.84	27.54	3990	0.49	0.38	77	12	55	
Moth beans	92.42	29.97	3890	0.34	0.39	-	-	-	
Ground nuts	78.99	29.44	5410	0.42	0.24	72	12	69	
Roughage									
a.Sacculant	27.48	8.21	3750	0.59	0.14	180	8	16	

jowar fodder									
ficus fodder	29.38	11.03	3680	1.18	0.17	230	6	18	
lucerne	22.05	20.21	3680	1.48	0.28	175	9	38	
b. Dry roughage									
paddy straw	86.54	3.91	3790	0.37	0.10	90	6	14	
Cereal by products									
Wheat bran	90.11	13.25	4080	0.58	0.85	40	11	43	
Gram husk	91.22	13.43	4010	0.32	0.52	40	13	4	
Vegetables									
Palak	11.40	14.20	3540	0.89	0.22	220	29	8	
Brinjil	17.40	18.8	3340	0.26	0.18	55	26	8	
Spinach	5.81	16.45	3780	0.83	0.21	383	22	8	
Beans	32.45	17.57	3980	0.82	0.31	83.20	32	14.10	
Peas	27.48	28.88	3950	0.21	0.31	80	52	11	
Sweet potato	28.45	3.85	4062	0.44	0.16	31.60	120	11.80	
Cabbage	6.78	18.15	2340	0.58	0.29	115	8	35	
Tomato	5.98	14.18	3770	0.45	0.22	175	9	38	
Potato	26.85	6.45	4010	0.06	0.21	70	18	11	
Pumpkin	12.75	6.64	2451	0.23	0.22	22.7	23.8	4.3	
Onion	12.45	16.48	4050	0.48	0.24	-	-	-	
Green chilly	10.14	18.40	3084	0.20	0.41	65	25	5	
Bottle guard	5.23	4.11	3450	0.43	0.24	85	32	12	
Green pea	21.45	21.84	3910	0.29	0.23	88	-	-	
Tapioca	38.10	3.14	3870	0.13	0.11	25	8	21	
Fruits									
Banana	24.18	5.62	3950	0.11	0.24	25	18	7	
Orange	12.48	5.80	3680	0.15	0.12	17	18	8	
Apple	15.87	5.01	3570	0.05	0.11	110	34	8	
Grape	7.60	7.11	4050	0.04	0.38	38	18	11	
Papaya	10.74	5.92	3810	0.27	0.08	0	33	12	

Carrot	8.94	5.23	3900	0.43	0.17	150	5	14	
Sweet lime	6.10	5.04	4010	0.19	0.22	28	11	25	
Chickoo	22.81	3.88	3990	0.14	0.18	48	17	8	
Mosambi	11.88	4.97	3870	0.18	0.21	22	21	9	
Pomegranate	23.14	5.43	3890	0.11	0.22	18	22	11	
Pineapple	14.15	5.78	3940	0.12	0.08	35	11	35	
Cucumber	6.42	5.88	3740	0.31	0.19	74	11	25	
Jackfruit shoot	29.45	17.85	3845	0.48	0.22	150	14	8.1	
Singhada	8.49	8.14	3440	0.18	0.14	68	9	34	
Amla	18.8	2.66	3100	0.27	0.12	20	-	-	
Musk milan	12.45	6.18	3950	0.30	0.19	110	9	29	
Guava	14.34	7.82	3680	0.16	0.24	68	11	27	
Berry	16.66	2.33	3650	0.21	0.11	16	19	7	
Grasses									
Paragrass	18.43	7.74	3720	0.98	0.16	170	5	-	
Mixed grass	23.45	9.12	3680	0.38	0.17	220	17	7	
Hybrid napier	31.85	7.85	3650	0.75	0.18	-	-	-	
Dal grass	21.45	7.41	3575	0.38	0.18	312	18	9	
Star grass	24.42	8.81	3770	0.43	0.26	340	46	11	
Reed grass	9.47	5.76	3410	0.42	0.08	230	6	22	
Tree leaves									
Ficus	35.29	14.43	3575	0.84	0.39	180	8	34	-
Gular	22.14	11.75	3790	1.27	0.19	-	-	-	-
Peepal	25.43	11.15	3680	1.14	0.22	270	19	11	-
Oak	23.45	9.85	3680	0.95	0.21	215	10	22	-
Okra	14.15	15.98	3680	0.42	0.24	145	10	32	-
Cake									
G N cake	90.45	40.45	4810	0.51	0.28	11	52	42	-
Animal protein feeds									
Milk	12.28	26.40	5480	1.04	0.98	4	35	5	-

Egg	26.40	49.24	6120	0.21	0.76	69	12	49	-
Meat	39.84	64.47	5030	1.75	1.18	-	-	-	27.20
Chicken	27.30	12.30	4240	2,85	1.43	38	5	48	78.14
Beef	42.11	67.49	5140	3.22	1.94	112	178	15	27.14
Liver	32.58	68.45	4700	0.04	0.76	-	-	-	
Miscellaneous feeds									
China rose	24.85	18.57	3890	1.10	0.28	470	35	9	-
Lettuce	5.81	25.90	3810	1.07	0.58	-	-	-	-
Amaranthus	14.45	21.45	3880	1.21	0.44	-	-	-	-
Plantain	17.14	8,28	3480	0.08	0.12	330	12	17	-
Colocassia	26.1	11.14	3590	0.18	0.54	55	8	33	-
Bamboo	41.31	7.1	4080	0.74	0.32	182	29	12	-
Sugarcane	39.45	3.88	3840	0.44	0.17	110	19	8	-
Gold mohar	23.81	20.48	3750	1.22	0.31	580	28	9	-
Concentrate mixtures									
Deer mash	90.45	23.45	4250	0.76	0.81	65	12	68	
Compound cattle feed	90.11	19.25	4050	0.78	0.95	75	12	70	
Poultry mash	90.00	22.27	4014	0.79	0.79	61	12	49	