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Every Life Matters

Animal Diet Manual

A reference guide for zoos

Disclaimer

The diet formulations in this Manual are indicative references and should be adapted to each animal's requirements, health status, physiological needs, available feed ingredients, and professional veterinary and nutritional advice. Regularly monitor body weight, body condition, feed intake, and relevant health parameters, and modify diets as needed.

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Foreword

Date: 11/05/2026

Nutrition is a fundamental component of animal health, welfare, reproduction and longevity in zoological institutions. Appropriate diet planning requires consideration of species-specific digestive physiology, natural feeding ecology, age, body weight, health status, activity level and environmental conditions.

This booklet, “Animal Diet Manual: A Reference Guide for Zoos”, has been developed as a practical resource for veterinarians, biologists, curators, keepers and other zoo personnel involved in animal nutrition and management.

The Manual outlines essential nutritional principles and provides indicative diet plans for different animal species. These diets should be treated as reference formulations and suitably adapted according to individual requirements, locally available feed ingredients and professional veterinary assessment. Regular monitoring of body weight, body condition, feed intake and health parameters is essential.

It is hoped that Animal Diet Manual: A Reference Guide for Zoos will serve as a useful working resource and promote greater consistency, scientific rigour and continual improvement in nutrition management across Indian zoos.

I acknowledge the contribution of all experts, institutions and officials involved in the preparation of this Manual and commend their efforts towards improving the standards of animal care and welfare in Indian zoos.

Dr. V. Clement Ben

Member Secretary, Central Zoo Authority

Preface

Animal nutrition is fundamental to animal welfare, health, reproduction and successful conservation of wildlife under human care. As zoos, wildlife rescue centres and conservation institutions increasingly contribute to the care and conservation breeding of threatened species, the need for scientifically informed, practical and species-specific feeding programmes has never been greater.

The diversity of wildlife presents a significant nutritional challenge. Different species have evolved distinct feeding strategies and digestive systems, and generic feeding practices cannot adequately address their biological needs. From specialised insectivores and carnivores to herbivores with complex digestive processes, nutrition must be considered in relation to species, life stage, body condition, health, reproductive status, season, environment and the quality and availability of feed resources.

This Animal Diet Manual has been developed as a practical reference to bridge this need, bringing together the principles of nutrition and digestive physiology with species-specific feeding information. It is intended to provide a common foundation for veterinarians, nutritionists, biologists, keepers and zoo managers in developing informed and scientifically sound feeding programmes.

The diets and feeding schedules presented in this manual should be considered reference guidelines rather than fixed prescriptions. They should be evaluated and periodically adapted based on body weight, body condition, health, behaviour, food intake, faecal quality, reproductive status, environmental conditions and measurable outcomes. Local and seasonal availability and the nutritional quality of feed ingredients should also be considered when developing individual diets.

As a global centre of excellence in wildlife care, conservation and animal welfare, Vantara recognises its responsibility to share knowledge, expertise and practical experience beyond its own facilities.

This manual is part of that commitment: to strengthen capacity, promote evidence-based animal management and support zoos, wildlife rescue centres and conservation institutions in India and around the world.

We hope this manual will serve as a useful resource for professionals caring for wildlife under human stewardship and provide a foundation for continued learning, collaboration, scientific exchange and improvement in animal nutrition and welfare.

Vivaan Karani

CEO, VANTARA

Introduction

Nutrition is one of the most fundamental yet often underestimated components of animal welfare, preventive healthcare and successful conservation management. In modern zoological institutions, particularly those caring for critically endangered and endangered species, feeding can no longer be viewed simply as the provision of food. It must be understood as a scientifically informed process that supports the physiological, behavioural and psychological needs of animals throughout their lives.

The evolution of modern zoos and wildlife rescue centres has brought a corresponding evolution in the way animals are managed. As institutions increasingly contribute to conservation breeding, rescue, rehabilitation and long-term care of threatened species, the nutritional quality of diets has become central to achieving these objectives. Diets must be evaluated not only on the basis of the ingredients offered, but also in relation to nutrient composition, digestibility, species-specific requirements, life stage, health, reproductive status, activity and the environmental conditions under which animals are maintained.

A further challenge is that many wild species have highly specialised feeding requirements that cannot be adequately addressed through generic diets. Species may depend on particular food resources that are difficult to reproduce in captivity. The feeding ecology of the Indian pangolin, for example, includes a strong dependence on ants and termites, while many reptilian species require appropriately sized live or whole prey. Several primates naturally consume substantial quantities of insects and other invertebrates, and insectivorous birds may also require insects as an important component of their diet. Such examples highlight the importance of developing appropriate live-feed and whole-prey cultures within zoological institutions and ensuring that specialised food resources are available in a safe, sustainable and nutritionally appropriate manner.

At the same time, standardisation is essential. Zoos require reliable reference points and scientifically informed protocols to establish consistent feeding practices, reduce nutritional deficiencies and support better animal management. However, standardisation should never mean treating every individual animal in the same manner. Species, individuals, age, body condition, physiological status, health, behaviour, seasonal changes and local availability of food resources must all be considered when developing and modifying a diet.

This manual is therefore significant because it brings together nutritional principles and practical species-specific feeding information into a single reference for zoological institutions and wildlife rescue and conservation centres. It provides a foundation upon which veterinarians, biologists, nutritionists, keepers and zoo managers can develop and evaluate feeding programmes suited to the animals under their care.

The ultimate purpose of nutrition is not merely to maintain an animal's body weight. An appropriately designed diet should support normal physiological function, growth, reproduction, immunity, longevity and species-appropriate behaviour, while contributing to the overall physical and psychological well-being of the animal.

In conservation breeding programmes, sound nutrition can also play an important role in maintaining healthy and reproductively capable populations.

This publication represents an important step towards strengthening evidence-informed feeding practices across zoological institutions. It should be regarded as a practical reference and a foundation for continued learning, professional exchange and refinement of dietary protocols.

Animal welfare is at the heart of responsible wildlife management. Providing every animal with appropriate nutrition, in accordance with its biological needs and natural history, is an essential expression of that commitment.

Dr. Brij Kishor Gupta

Director, VANTARA

Digestive Physiology of Herbivores

A Veterinary Perspective

Introduction

Herbivores have evolved remarkably specialised digestive systems that allow them to extract nutrients from fibrous plant material. The main challenge is that mammals do not produce enzymes capable of efficiently breaking down cellulose and hemicellulose. As a result, herbivores depend heavily on symbiotic microorganisms within the gastrointestinal tract to ferment these structural carbohydrates and convert them into usable energy. From a physiological standpoint, herbivores can broadly be divided into foregut fermenters and hindgut fermenters. Within the ruminants, further differences exist along the grazer–intermediate feeder–browser continuum. These distinctions are important because they influence gastrointestinal anatomy, rate of passage, microbial activity, nutrient utilisation, and susceptibility to digestive disturbances.

Oral Processing and Saliva

Digestion begins with prehension and mastication. The lips, tongue, incisors, and cheek teeth are adapted to the type of vegetation the animal normally consumes. Grazers are generally equipped to harvest grasses efficiently, while browsers are more selective and often use the lips and tongue to pick leaves, shoots, and twigs. Mastication reduces particle size and increases the surface area available for microbial colonisation. It also stimulates salivary secretion. In ruminants, saliva has a particularly important buffering role. It contains bicarbonate and phosphate, which help neutralise acids produced during fermentation. Saliva also contributes fluid, electrolytes, and nitrogenous compounds to the reticulorumen. For this reason, chewing activity, salivation, rumination, and ruminal pH are closely linked physiologically.

Foregut Fermentation

In ruminants, the stomach is divided into the rumen, reticulum, omasum, and abomasum. The rumen and reticulum function together as a large anaerobic fermentation chamber. They contain a complex microbial community made up of bacteria, protozoa, anaerobic fungi, methanogenic archaea, and bacteriophages. These microorganisms work collectively to degrade cellulose, hemicellulose, starch, proteins, and other dietary components. Anaerobic fungi are particularly useful in disrupting tough plant tissues, while cellulolytic bacteria are central to fibre digestion. The ruminal environment is kept relatively stable in terms of temperature, moisture, anaerobiosis, and pH. This stability is essential because the microbial population is highly sensitive to sudden changes in substrate or acidity.

| Volatile Fatty Acid Production

The major products of carbohydrate fermentation are volatile fatty acids, particularly acetate, propionate, and butyrate. Acetate is produced mainly during fibre fermentation and is an important source of energy and a precursor for lipid synthesis. Propionate is the main gluconeogenic volatile fatty acid. After absorption from the rumen, it is transported to the liver and used to produce glucose. Butyrate is metabolised extensively by the ruminal epithelium, particularly to beta-hydroxybutyrate, and serves as an important energy source for the gastrointestinal tissues and the animal as a whole. The proportions of these volatile fatty acids vary depending on the type of feed, ruminal pH, microbial population, and passage rate.

| Ruminal pH and Buffering

Because microbial fermentation continuously produces organic acids, maintenance of ruminal pH is a central part of normal digestive physiology. Ruminal pH is influenced by the balance between acid production, salivary buffering, absorption of volatile fatty acids, and fluid passage. When pH falls, the ruminal microbial population changes. Fibre-digesting microorganisms are particularly sensitive to acidic conditions, so persistent decreases in pH can reduce fibre digestion and alter normal fermentation. This is why ruminal pH should be viewed not only as a chemical measurement but as a major regulator of microbial ecology and digestive efficiency.

| Rumination and Particle Retention

Rumination involves regurgitation, remastication, resalivation, and reswallowing. This process further reduces forage particle size, improves microbial access to plant material, and increases salivary buffering. The reticulorumen also acts as a selective retention system. Larger particles are retained for further rumination and fermentation, while smaller particles eventually pass through the reticulo-omasal opening. The efficiency of digestion therefore depends on the interaction between particle size, rumination, microbial degradation, retention time, and passage rate. This selective retention is one of the main reasons ruminants can extract nutrients efficiently from fibrous feeds.

| Microbial Protein and Nitrogen Metabolism

Rumen microorganisms use dietary nitrogen to synthesise microbial protein. As these microorganisms pass into the abomasum and small intestine, they are digested by the host animal. Their proteins are then broken down into amino acids that can be absorbed. This gives ruminants an important nutritional advantage because microbial biomass becomes a useful protein source. Rumen microbes also synthesise several vitamins, especially B-complex vitamins and vitamin K. The microbial population therefore contributes not only to fibre digestion but also to protein and vitamin nutrition.

Omasal and Abomasal Function

After leaving the reticulorumen, digesta enters the omasum. The omasum contributes to further particle processing and the absorption of water, electrolytes, and fermentation products. Digesta then enters the abomasum, which is the glandular or “true” stomach. Here, hydrochloric acid and proteolytic enzymes begin conventional gastric digestion. Microbial protein, undegraded dietary protein, and other organic material are digested before entering the small intestine. Ruminant digestion can therefore be viewed as a two-stage process: microbial fermentation first, followed by enzymatic digestion by the host.

Small Intestinal Digestion and Absorption

In the small intestine, pancreatic enzymes, intestinal enzymes, and bile continue the digestive process. Amino acids, fatty acids, minerals, vitamins, and other nutrients are absorbed through the intestinal mucosa. The small intestine is particularly important for the absorption of amino acids derived from both microbial protein and dietary protein that escapes ruminal degradation. Although most dietary carbohydrate in ruminants is fermented before reaching the small intestine, some starch and other carbohydrates may escape ruminal fermentation and undergo enzymatic digestion further downstream.

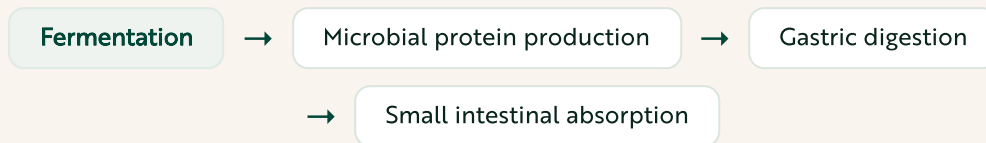
Hindgut Fermentation

Hindgut fermenters include animals such as horses, zebras, rhinoceroses, elephants, and tapirs. In these species, the sequence of digestion is different. Food first passes through the stomach and small intestine, where enzymatic digestion occurs. Structural carbohydrates then enter an enlarged caecum and colon, where microbial fermentation takes place. The microorganisms in the hindgut produce volatile fatty acids in much the same way as ruminal microbes. These fatty acids are absorbed through the caecal and colonic mucosa and make an important contribution to energy metabolism. The main physiological difference is that fermentation occurs after the small intestine. As a result, microbial protein formed in the hindgut is not utilised as efficiently as in ruminants because it is produced beyond the major site of amino-acid absorption. Hindgut fermenters compensate partly through a relatively rapid passage rate and a high capacity for forage intake. This allows them to process large quantities of fibrous vegetation, even when extraction efficiency from each unit of feed is lower.

Foregut versus Hindgut Fermentation

The most important difference between the two systems is the location of fermentation.

| In foregut fermenters



| In hindgut fermenters



Foregut fermentation allows more efficient use of microbial protein, while hindgut fermentation allows faster throughput and high forage intake. Both systems are effective, but they represent different evolutionary solutions to the same challenge: extracting energy from plant fibre.

| Grazer–Browser Digestive Specialisation

Even among ruminants, digestive physiology is not uniform. Species exist along a continuum from grazers to intermediate feeders to browsers. Grazers consume predominantly grasses, which are generally more fibrous and rich in structural carbohydrates. Browsers consume leaves, shoots, herbs, and woody vegetation. Browse often contains higher concentrations of soluble nutrients but may also contain tannins, phenolics, and other plant secondary compounds.

Intermediate feeders can shift between grass and browse depending on season and availability. These feeding categories therefore reflect more than simple dietary preference. They are associated with differences in gastrointestinal morphology, retention time, passage rate, feeding selectivity, and the way each species interacts with its gastrointestinal microbiome.

| The Gastrointestinal Microbiome

The microbiome is best considered a functional part of the herbivore digestive system. It contributes to fibre degradation, volatile fatty acid production, nitrogen metabolism, vitamin synthesis, and epithelial function. The microbial population is also dynamic. It changes in response to substrate availability, pH, rate of passage, and host physiology. Because of this, disturbances in the microbial ecosystem can affect digestive function before obvious clinical signs become apparent. For veterinarians, this is particularly important when interpreting changes in appetite, rumination, faecal consistency, abdominal distension, or general gastrointestinal performance.

Veterinary Perspective

Herbivore digestion should be viewed as an integrated physiological process involving feeding ecology, oral processing, gastrointestinal anatomy, motility, microbial fermentation, retention & passage, nutrient absorption and metabolism. The key principle is that herbivores do not digest fibre independently. They rely on highly specialised gastrointestinal ecosystems in which microorganisms convert plant structural carbohydrates into usable energy.

For veterinarians, understanding the differences between foregut and hindgut fermentation, ruminal microbial ecology, volatile fatty acid metabolism, digesta kinetics, and grazer–browser specialisation provides the physiological foundation for interpreting both normal gastrointestinal function and digestive disease in domestic, zoo, and free-ranging herbivores.

Dr. Thirumurugan R

Veterinarian, VANTARA

02

Fundamental Nutrient Components of Diets for Zoo & Rescue-Centre Animals

Introduction

Nutrition is a fundamental component of preventive medicine, animal welfare and population management in zoological institutions and wildlife rescue centres. A nutritionally adequate diet must provide energy, protein and essential amino acids, lipids and essential fatty acids, carbohydrates and fibre, vitamins, minerals, water and electrolytes in appropriate amounts and proportions. Importantly, nutrient requirements vary substantially between taxa because of differences in gastrointestinal anatomy, metabolic physiology, natural feeding ecology, body size, life stage and environmental conditions. Zoo diets should therefore not simply reproduce the visible ingredients consumed in nature. They should reproduce, as closely as practicable, the nutritional and physiological characteristics of the natural diet while supporting species-appropriate feeding behaviour. Requirements derived from domestic species can provide useful reference points where species-specific data are unavailable, but they must be interpreted cautiously.

Complete diet

ENERGY-YIELDING NUTRIENTS

Protein → amino acids

Fat → essential fatty acids

Carbohydrate → glucose / fermentation

REGULATORY NUTRIENTS

Vitamins

Minerals

STRUCTURAL / FUNCTIONAL

Water

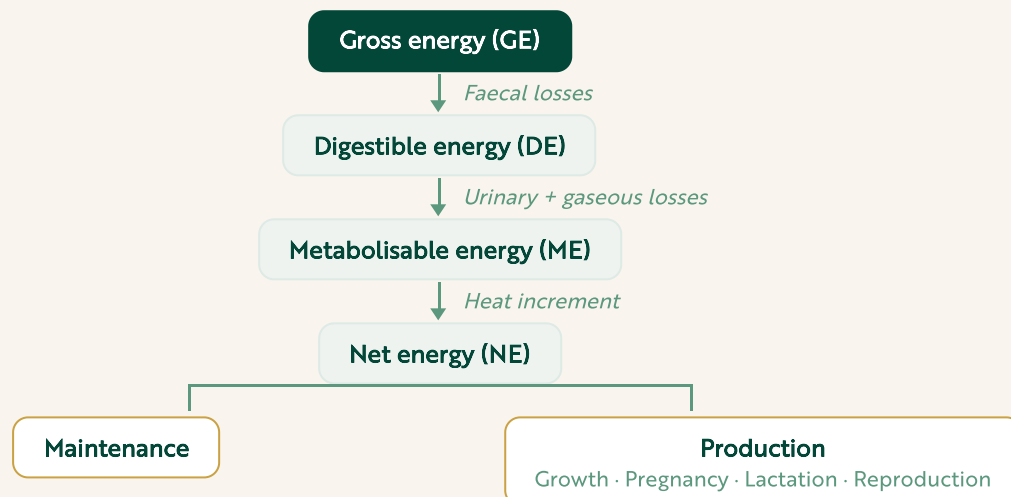
Fibre

Energy

Energy is not itself a nutrient but represents the capacity of nutrients to support biological work. Dietary energy is principally obtained from fat, carbohydrate and protein. It is required for basal metabolism, thermoregulation, muscular activity, tissue synthesis, immune function, reproduction, lactation and growth.

Metabolisable energy is commonly the most useful measure when evaluating diets. Energy requirements vary with species, metabolic body size, age, activity, ambient temperature, reproductive status, health and physiological state. Chronic excess energy intake promotes obesity and associated metabolic and locomotor disorders, whereas inadequate energy causes loss of body mass, depletion of fat stores, muscle catabolism, impaired reproduction and compromised immunity.

Partitioning of dietary energy



Energy is conventionally expressed as kilocalories (kcal) or megajoules (MJ).

For zoo animals, body weight trends and validated body-condition scoring (BCS) should therefore be incorporated into routine nutritional monitoring.

Protein and Amino Acids

Proteins are nitrogen-containing macromolecules composed of amino acids linked by peptide bonds. They provide structural and functional components required for virtually every tissue.

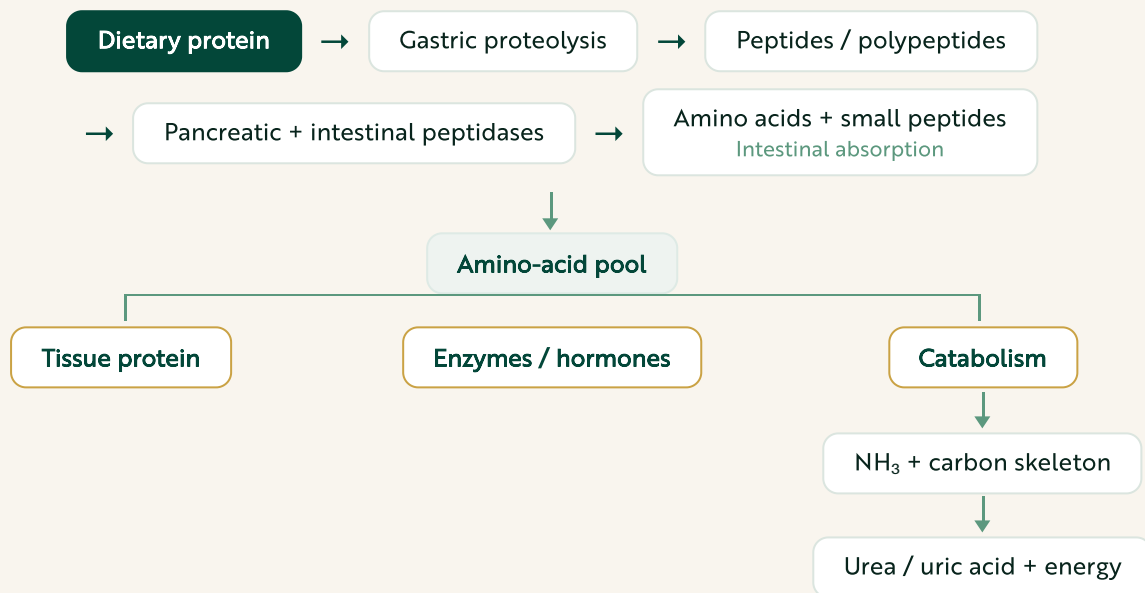
Principal functions: Proteins are required for:

- Skeletal-muscle and connective-tissue formation;
- Enzymes and peptide hormones;
- Transport proteins;
- Antibodies and immune mediators;
- Haemoglobin and other functional proteins;
- Tissue growth, maintenance and repair; and
- Production of milk, eggs, hair, feathers, scales and other tissues.

Protein requirement should therefore be considered in terms of both quantity and amino-acid quality. Essential amino acids cannot be synthesised in sufficient quantities by the animal and must be supplied through the diet. Their requirement varies among taxa. For example, felids have several distinctive nutritional adaptations. Taurine is an essential dietary amino acid for cats, while adequate

dietary arginine is particularly important. Felids also have limited metabolic capacity for several nutrient conversions compared with many omnivorous mammals. In herbivores, microbial fermentation can substantially modify dietary protein. Rumen microorganisms, for example, utilise nitrogen sources to synthesise microbial protein, which subsequently contributes amino acids to the host.

Dietary protein undergoes enzymatic digestion before absorption



Practical principle: High crude-protein concentration does not necessarily indicate a nutritionally superior diet; amino-acid composition, digestibility and bioavailability are equally important.

Fat and Essential Fatty Acids

Dietary lipids are concentrated sources of energy and provide approximately 9 kcal/g, compared with approximately 4 kcal/g from protein or digestible carbohydrate.

Major functions include:

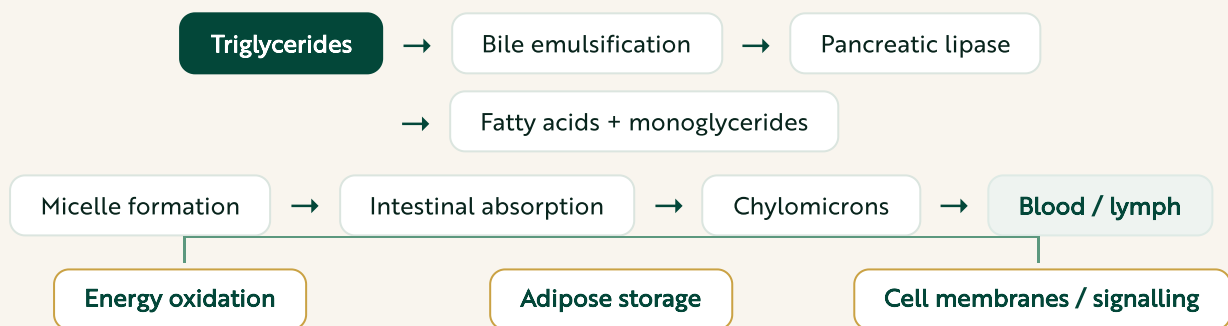
- Provision and storage of metabolic energy;
- Formation of cellular membranes;
- Provision of essential fatty acids;
- Synthesis of eicosanoids and other signalling molecules;
- Thermal insulation and organ protection;
- Enhancement of palatability; and
- Absorption of the fat-soluble vitamins A, D, E and K.

Essential fatty acids

The principal essential fatty-acid families are omega-6 (n-6) and omega-3 (n-3) polyunsaturated fatty acids. Linoleic acid is an important dietary n-6 fatty acid, while α-linolenic acid represents the major plant-derived n-3 precursor. Species differences are critical. Felids have limited ability to synthesise sufficient arachidonic acid from linoleic acid, making dietary arachidonic acid particularly important.

Deficiency of essential fatty acids can produce poor skin and coat condition, impaired growth, reproductive dysfunction and altered inflammatory or immune responses. Conversely, excessive dietary fat can markedly increase dietary energy density and predispose captive animals with restricted activity to obesity.

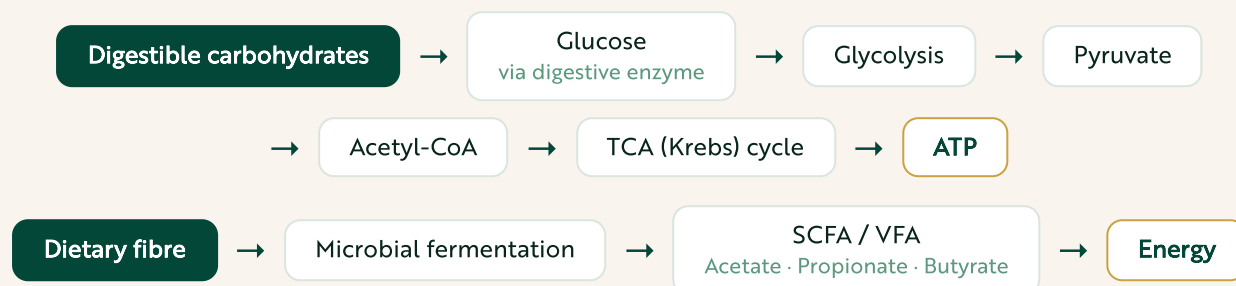
Lipid digestion and utilisation



Carbohydrates

Carbohydrates include simple sugars, oligosaccharides, starches and structural polysaccharides. Their nutritional significance varies dramatically between taxa. Glucose is an important metabolic substrate, but dietary carbohydrate requirement is highly species-dependent. Herbivores obtain substantial energy indirectly through microbial fermentation of plant carbohydrates, whereas obligate carnivores derive a much larger proportion of their metabolic substrates from protein and fat. Excessive readily fermentable carbohydrate is particularly undesirable in many herbivorous species because rapid fermentation can disrupt gastrointestinal microbial ecology.

Carbohydrates: metabolic pathways



Dietary Fibre

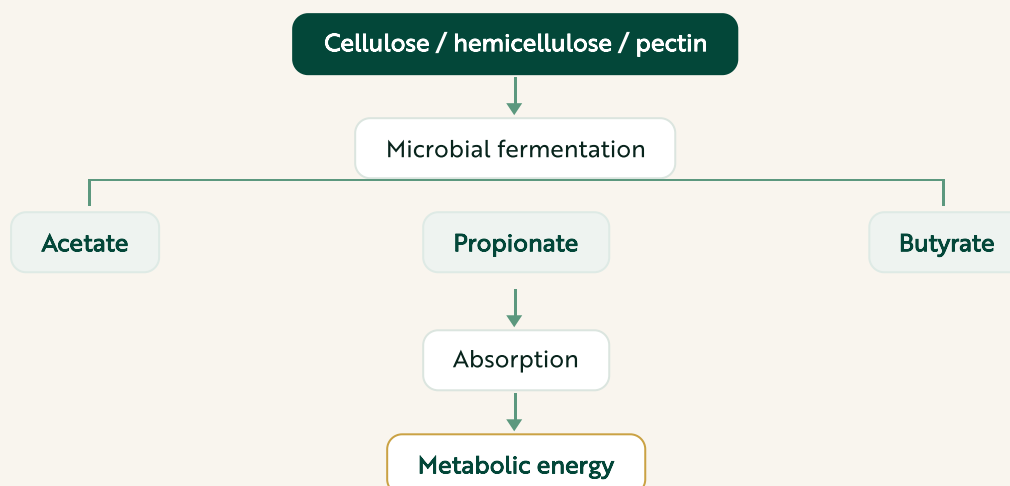
Fibre is not simply an inert bulking material. It encompasses plant structural carbohydrates including cellulose, hemicellulose, pectins and associated lignified material.

Microbial fermentation produces short chain/volatile fatty acids (SCFA/VFA), principally acetate, propionate and butyrate, which can provide substantial metabolic energy to herbivores.

Its physiological importance depends strongly on digestive strategy.

Feeding group	Major nutritional role of fibre
Grazing herbivores	Substrate for microbial fermentation; promotes normal gastrointestinal function.
Browsers	Structural and fermentable substrate characteristic of browse-based diets.
Hindgut fermenters	Fermentation in the caecum/colon producing volatile fatty acids.
Omnivores	Gastrointestinal motility, microbiome and stool quality.
Carnivores	Smaller amounts may influence gastrointestinal function and microbiota.

Fibre fermentation



Ruminants and hindgut-fermenting zoo species therefore require diets containing sufficient physically and chemically appropriate fibre. Excess concentrates and insufficient roughage can predispose susceptible herbivores to gastrointestinal disease and obesity. Current zoo-nutrition guidance consequently emphasises high-quality forage/browse as the nutritional foundation for many herbivorous taxa.

Vitamins

Vitamins are organic micronutrients required in comparatively small quantities for normal metabolism. They generally do not supply energy but function as coenzymes, antioxidants, transcriptional regulators and components of physiological pathways. Fat-soluble vitamins can accumulate in tissues.

Group	Vitamins	Principal functions
Fat-soluble	A, D, E, K	Vision/epithelia, Ca-P regulation, antioxidant defence, coagulation
Water-soluble	B-complex, C	Energy metabolism, enzyme systems, neurological and cellular functions

Consequently, both deficiency and excessive supplementation may cause disease. Vitamin supplementation should therefore be based on assessment of the complete diet rather than routinely added without calculation. Vitamin requirements may also be species-specific. For example, species differ in their ability to synthesise vitamin C or convert carotenoids into biologically active vitamin A. Frozen fish deserves particular attention in piscivorous zoo species because prolonged storage and

thiaminase-containing fish can contribute to vitamin E and thiamine deficiencies, making appropriately formulated supplementation necessary in susceptible diets.

Minerals

Minerals are inorganic nutrients classified broadly as macrominerals and trace minerals.

Macrominerals

Calcium (Ca), phosphorus (P), sodium (Na), potassium (K), chloride (Cl), magnesium (Mg) and sulphur (S).

Trace minerals

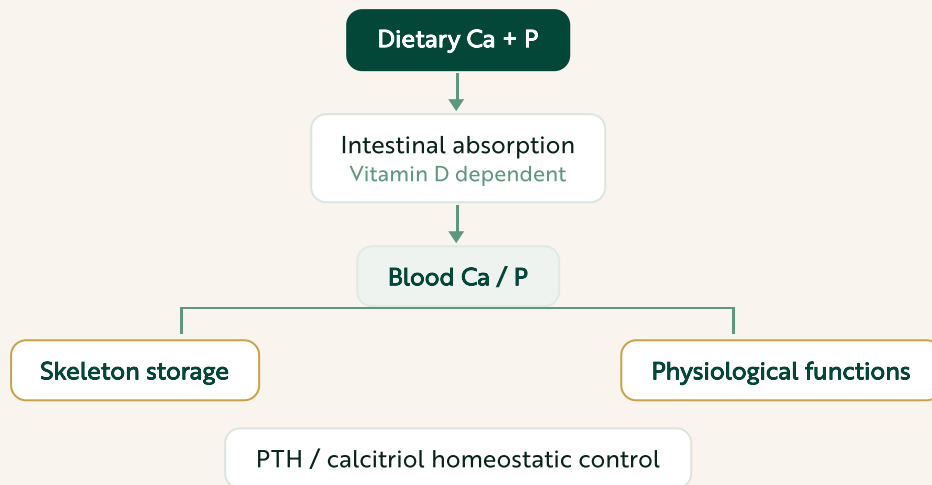
Iron (Fe), Copper (Cu), Zinc (Zn), Manganese (Mn), Selenium (Se), Iodine (I), Cobalt (Co) and others.

They contribute to:

- Skeletal Mineralisation
- Osmotic and Acid-Base Balance
- Nerve Conduction
- Muscle Contraction
- Oxygen Transport
- Enzyme Systems
- Thyroid function
- Antioxidant defence
- Reproduction and Immunity

Minerals must be evaluated as a balanced system, because excessive intake of one element can interfere with absorption or metabolism of another. The calcium:phosphorus relationship is particularly important in growing animals, reptiles, birds and mammals. Incorrect Ca:P balance, inadequate vitamin D/UVB exposure or inappropriate supplementation can contribute to metabolic bone disease. Trace-mineral supplementation must also be species appropriate. Excessive iron, copper or selenium can be harmful. Certain browsing rhinoceros species, for example, warrant particular attention to dietary iron exposure.

Calcium–phosphorus relationship



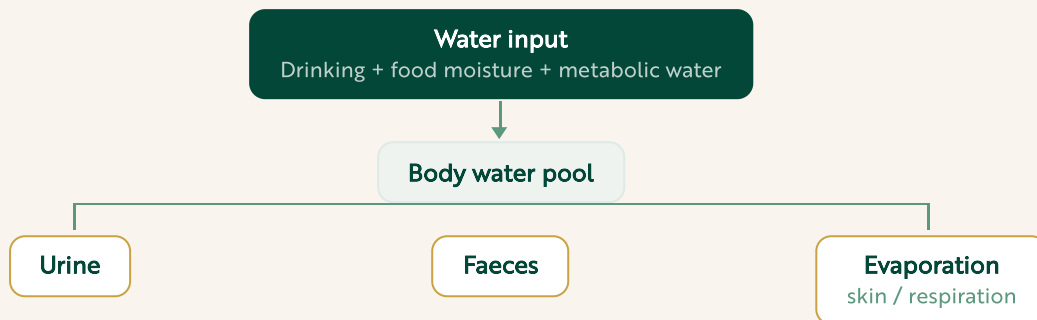
Water

Water is the most immediately essential nutrient. It serves as the biological medium for metabolic reactions and is necessary for:

- Thermoregulation
- Digestion and Gastrointestinal Function
- Nutrient Transportation
- Renal Excretion
- Lubrication
- Maintenance of Circulating Blood Volume
- Cellular and Electrolyte Homeostasis

Requirements are influenced by body size, diet moisture, environmental temperature and humidity, activity, reproductive status and renal function. Animals consuming dry pellets or hay generally require more drinking water than animals consuming moisture-rich foods. Clean potable water should normally be continuously available to non-marine zoo and rescue animals, while delivery systems should reflect species behaviour. Some reptiles, for example, obtain significant water from food, droplets or environmental moisture rather than readily drinking from bowls.

Water balance

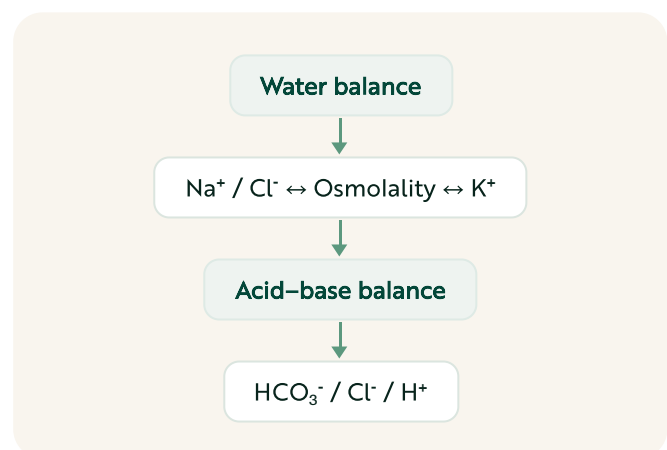


Electrolytes

Electrolytes are charged minerals dissolved in body fluids. The principal physiologically important electrolytes include Na^+ , K^+ , Cl^- , Ca^{2+} , Mg^{2+} , HCO_3^- and phosphate.

They maintain:

- Extracellular and Intracellular Fluid Distribution
- Osmotic Pressure
- Membrane Potentials
- Nerve Impulses
- Skeletal and Cardiac Muscle Contraction
- Acid-Base Balance
- Hydration

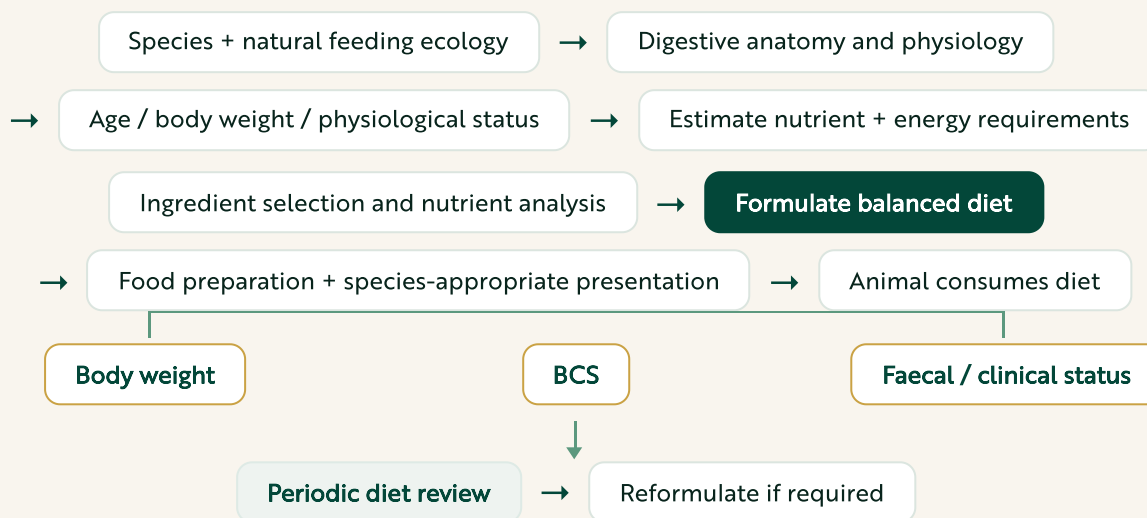


Electrolyte disturbances may arise through prolonged diarrhoea, vomiting, renal disease, heat stress, dehydration, inappropriate salt supplementation or prolonged anorexia. Routine electrolyte supplementation of healthy animals receiving a balanced diet and adequate water is generally unnecessary. Therapeutic electrolyte replacement should be based on veterinary assessment and, where appropriate, laboratory evaluation.

Integrated Nutritional Approach for Zoo and Rescue Centres

No nutrient should be evaluated independently. Diet formulation should integrate nutritional requirements with the animal's natural history and digestive physiology.

Diet formulation and review cycle



International zoo-nutrition practice increasingly treats diet formulation as a dynamic process rather than a fixed feeding chart. Diets should be reviewed against actual intake, body weight and condition, health, faecal quality, reproductive performance and behaviour. Particular care is required in rescue centres because animals may arrive malnourished, dehydrated, injured, diseased or with unknown previous feeding histories. Nutritional rehabilitation should therefore be individualised and undertaken under veterinary/nutritional supervision.

A sound institutional feeding programme should ultimately aim to provide **nutritional adequacy + physiological suitability + food safety + behavioural opportunity + consistency + measurable outcomes**.

References

- Association of Zoos and Aquariums. (2026). *Nutrition Scientific Advisory Group: Veterinary care and nutrition—Feeding program guidelines for AZA institutions*. Association of Zoos and Aquariums.
- Banerjee, G. C. (2018). *A textbook of animal husbandry*. Oxford & IBH Publishing Co.
- Central Zoo Authority. (2022). *Annual report and feeding schedule: Sri Sayajibaug Zoo*. Ministry of Environment, Forest and Climate Change, Government of India.
- McDonald, P., Edwards, R. A., Greenhalgh, J. F. D., Morgan, C. A., Sinclair, L. A., & Wilkinson, R. G. (2022). *Animal nutrition* (8th ed.). Pearson.
- National Research Council. (2006). *Nutrient requirements of dogs and cats*. The National Academies Press. <https://doi.org/10.17226/10668>
- Nijboer, J., & Fens, A. (2025a). Nutrition in ungulates and subungulates. In *Merck veterinary manual*. Merck & Co., Inc.
- Nijboer, J., & Fens, A. (2025b). Nutrition in zoo carnivores (J. Brandão, Reviewer). In *Merck veterinary manual* (Professional version). Merck & Co., Inc.

- Nijboer, J., & Fens, A. (2025c). Overview of nutrition: Exotic and zoo animals. In *Merck veterinary manual*. Merck & Co., Inc.
- Ranjhan, S. K. (1998). *Nutrient requirements of livestock and poultry*. Indian Council of Agricultural Research.
- Sanderson, S. L. (2024). Nutritional requirements of small animals (E. Prouty, Reviewer). In *Merck veterinary manual* (Professional version). Merck & Co., Inc.

Note: AI was used for reviewing this compilation and image generation.

Manual Note

This section establishes general nutritional principles for a multi-species zoological collection or wildlife rescue centre. It should not be interpreted as a species-specific ration schedule. Individual diets should subsequently be developed according to taxon, natural feeding strategy, body weight, physiological state, clinical condition, environmental conditions and institution-specific feed analysis. This approach is consistent with modern zoo-nutrition guidance, which discourages assuming that one standardised diet is appropriate across individuals or institutions.

Dr Sujay Suresh

Veterinarian, VANTARA

An Introductory Framework Integrating Wild Feeding Ecology, Functional Morphology, Nutrition, Behaviour and Longitudinal Health Assessment

Introduction

Feeding facility-managed felids is a biological and clinical process rather than simply the allocation of a daily quantity of meat. Members of Felidae are obligate carnivores with anatomical, metabolic and behavioural adaptations for locating, capturing, processing and digesting animal prey. Their comparatively high dietary protein requirement, dependence on specific animal-derived nutrients, sectorial carnassial dentition, powerful jaw and cervical musculature, sensory specialisations and relatively simple gastrointestinal tract collectively reflect this evolutionary history. A scientifically designed feeding programme must therefore address nutrient adequacy, food structure, feeding behaviour, oral function, gastrointestinal response, body composition and individual health simultaneously. Wild feeding ecology provides the biological reference point, but it should not be copied literally into managed care. Free-ranging felids experience variable prey abundance, energetic expenditure during hunting, unsuccessful hunting attempts, competition, seasonal changes and irregular access to carcasses. Facility-managed animals generally have predictable food availability, lower energetic costs of acquisition, controlled social conditions, veterinary intervention and often greater longevity. The objective is therefore to translate relevant components of natural feeding biology into safe, measurable and nutritionally controlled husbandry practices.

Wild Feeding Ecology and Interspecific Variation

Felids occupy a broad spectrum of predatory niches. Small species may capture numerous rodents, birds, reptiles, amphibians or invertebrates, whereas large *Panthera* species commonly exploit medium- to large-bodied vertebrates. Predator body size strongly influences prey size, but prey abundance, habitat structure, season, competition and local opportunity modify actual diet. For example, Bengal tiger diet is dominated in many landscapes by medium- and large-bodied ungulates, but it is incorrect to describe tigers as exclusively cervid feeders. A recent synthesis of 48 studies from the Indian subcontinent documented approximately 30 mammalian prey species; chital, sambar, wild boar, langur, muntjac and livestock together accounted for most estimated biomass consumed. Site-specific studies likewise demonstrate selection for large prey while showing substantial ecological flexibility. The behavioural sequence preceding ingestion is equally important. Food acquisition may involve searching, visual or auditory localisation, stalking, crouching, pursuit, pouncing, grappling, restraint and a killing bite. The mechanics of killing are context dependent. Large felids frequently

employ throat or neck bites that can compromise the airway and/or major cervical vessels. Jaguars can also employ powerful cranial bites, while prey size and defensive behaviour can substantially alter bite placement. Post-capture behaviour differs among species. Leopards commonly move kills and may hoist carcasses into trees, particularly where kleptoparasitism is important. Tigers often drag large prey to secluded cover and may revisit a kill. Lions can hunt individually but cooperative hunting is a major component of their ecology; communal feeding introduces competition, displacement and differential carcass access. These differences are directly relevant to managed feeding because social access, food location, resistance of the food item and opportunities for manipulation influence both behaviour and actual nutrient intake.

Feast-Fast Biology, Meal Size and Feeding Frequency

Large felids can consume relatively large meals after successful hunts and subsequently experience variable intervals before the next kill. This is often described as feast-fast feeding biology. The concept is useful, but it should not be translated into arbitrary fasting schedules. Wild fasting is a consequence of hunting ecology and is accompanied by substantial energetic expenditure and behavioural activity. Under human care, feeding frequency should instead be determined by species, individual energy requirements, body condition, age, medical status, reproductive state, medication schedules and welfare considerations. Small felids, which naturally obtain smaller prey and may make repeated hunting attempts, should not automatically be managed using the same episodic feeding model as large *Panthera*. Controlled variability in feeding time, location and portion size can nevertheless reduce excessive predictability and create opportunities for appetitive behaviour. Such variation should occur within a documented nutritional plan so that weekly nutrient and energy provision remains appropriate.

Nutritional Completeness: Beyond Skeletal Muscle

The nutritional composition of a carnivore diet is as important as its behavioural presentation. Skeletal muscle alone does not reproduce the nutrient profile of whole prey. Muscle meat is typically phosphorus-rich relative to calcium and, if used without an appropriate calcium source or complete formulation, can produce an undesirable calcium-to-phosphorus balance. Felids also have specific requirements for nutrients such as taurine, arginine, arachidonic acid and preformed vitamin A. Taurine deserves particular attention because inadequate intake or processing-related losses can have serious retinal, cardiac and reproductive consequences. Whole prey provides muscle, viscera, connective tissue, skin, bone and other tissues, but 'whole prey' should not be assumed to mean 'automatically complete.' Published analyses of commercially available mammalian and avian prey items demonstrate substantial variation in dry matter, protein, fat, ash, minerals and fatty acids. Thus, prey species, age, tissue composition, storage, freezing, processing and supplementation can all influence nutrient delivery. Food structure may itself influence gastrointestinal physiology. Research using whole versus minced mice in domestic cats, used as a model for strict carnivores, indicates that physical structure can influence digestive and microbial outcomes even when the chemical diet is similar. This reinforces the concept that diet evaluation should consider both nutrient composition and physical form.

Dentition and Oral Function as Components of Nutritional Assessment

Dentition forms the mechanical interface between prey and nutrient acquisition. Incisors assist with gripping and scraping tissue; elongated canines contribute to prey restraint and killing; premolars and the carnassial complex provide cutting and shearing; the tongue and forelimbs assist carcass stabilisation and tissue removal. The ability to tear fascia, skin and muscle or manipulate bone therefore depends on functional teeth, gingiva, temporomandibular structures and associated musculature. Dental disease can alter feeding before overt anorexia develops. Fractured canines, worn teeth, periodontal disease, gingival recession, missing carnassials, oral ulcers or pain may present as slower feeding, unilateral chewing, dropping food, preference for softer tissues, avoidance of bone, abnormal head positioning or reduced manipulation. Consequently, an apparently appropriate ration may still fail to meet an individual's practical nutritional needs if the animal cannot process it normally. Oral and dental assessment should therefore be linked directly to feeding records, rather than treated as an isolated clinical examination.

Vibrissae and Sensory Contributions to Feeding

Facial vibrissae are specialised tactile organs embedded in highly innervated follicles. Mystacial vibrissae and other facial tactile hairs provide close-range information about objects near the muzzle and can be particularly useful where visual information is limited. During prey restraint and carcass manipulation, tactile information may contribute to spatial orientation and positioning. The number, row arrangement, orientation and length of vibrissae vary among felids and offer an interesting field for comparative morphometric study. However, claims that a particular hunting system—such as cooperative hunting in lions—directly causes a lower whisker number are not presently established. Whisker morphology should therefore be described as a sensory and comparative anatomical characteristic, and correlations with prey size, craniofacial dimensions, habitat or hunting strategy should be tested rather than assumed.

Translating Feeding Ecology into Facility Management

Managed feeding should preserve biologically meaningful elements of food acquisition without exposing animals or personnel to unnecessary risk. Food-based enrichment is therefore broader than puzzle feeders. Hidden meat pieces can stimulate searching; dispersed feeding can increase locomotion; suspended or secured food can promote pulling and tearing; large pieces can prolong manipulation; elevated feeding can be considered for species with strong scansorial or arboreal feeding tendencies; and multiple feeding stations can reduce monopolisation in compatible social groups. The goal is not to simulate a kill but to offer safe opportunities for components of the natural behavioural sequence. Feeding devices and presentation methods should be evaluated for entanglement, foreign-body ingestion, dental trauma, aggression, unequal food access and interference with medical monitoring. Behavioural complexity should never compromise nutritional completeness or food hygiene.

Body Condition, Muscle Condition and Energy Balance

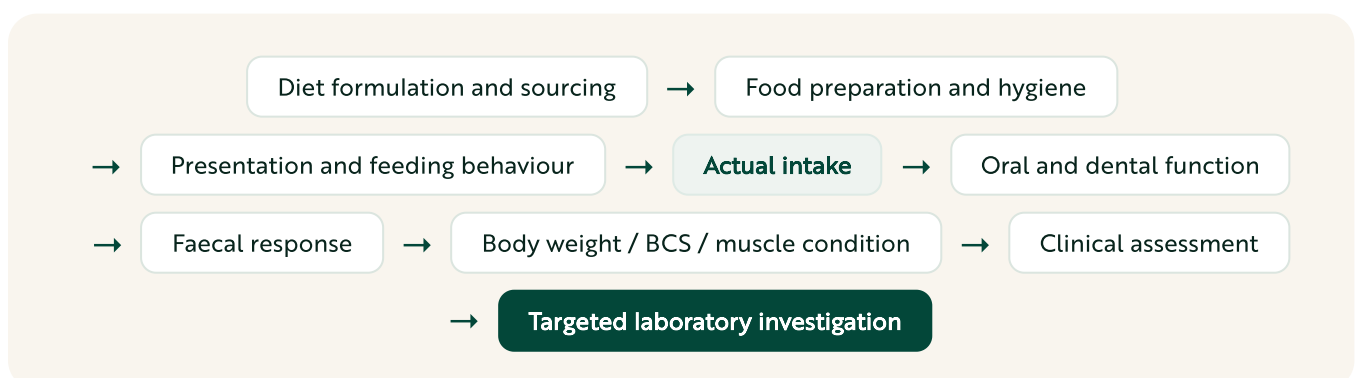
Body weight is essential but insufficient as a stand-alone measure of nutritional status. Two animals of similar mass can differ substantially in adiposity and lean muscle. Serial body-condition scoring (BCS) should therefore be combined with body weight and, where practical, muscle-condition assessment. In a five-point system, the central score generally represents an appropriate condition, but interpretation must account for species morphology, sex, age, coat and individual muscularity. A rising BCS should prompt review of total energy intake, dietary fat, treats, feeding frequency, activity and reproductive status. Conversely, low BCS or progressive weight loss should trigger assessment of food access, palatability, dental function, gastrointestinal disease, parasitism, chronic systemic disease and age-related sarcopenia before simply increasing ration size. In geriatric felids, muscle loss can coexist with apparently adequate fat stores, making combined BCS and muscle assessment particularly important.

Faecal Condition as a Non-Invasive Nutritional Monitor

Faecal assessment provides a practical, repeatable and non-invasive window into gastrointestinal response to diet. Consistency, volume, frequency, colour, odour, visible bone fragments, hair, mucus, blood and undigested material can be recorded using a standardised institutional faecal scoring system. Longitudinal change is more informative than a single stool. Dietary fat, bone content, digestibility, abrupt dietary transitions and prey structure can influence faecal characteristics, but abnormal faeces are not specific for nutritional disease. Parasites, infectious disease, inflammatory gastrointestinal disorders, medication, and stress must also be considered. Faecal scoring is therefore best used as one component of an integrated surveillance system and can guide when faecal parasitology, microbiology or other diagnostics are warranted.

An Integrated Feeding-Health Surveillance Framework

A robust programme follows the animal from diet formulation through physiological outcome. The practical sequence can be expressed as:



Daily records should document food offered, food refused, abnormal feeding behaviour, medication-associated changes, and stool quality. Periodic review should include body weight, BCS, muscle

condition, oral health, and diet calculations. Persistent deviations should trigger clinical evaluation and, where indicated, haematology, serum biochemistry, urinalysis, faecal testing, imaging or nutrient-specific assessment. Taurine status, for example, can be evaluated using plasma and whole-blood concentrations when deficiency is a concern. Food safety is integral to this framework. Raw meat and carcass products require approved sourcing, cold-chain control, hygienic thawing, prevention of cross-contamination, inspection before feeding and timely removal of uneaten material. Carcass feeding protocols should also consider bones, gastrointestinal contents, zoonotic pathogens, residues and the health history of source animals.

Conclusion

The most effective nutritional programme for facility-managed felids is one that integrates evolutionary biology with measurable clinical outcomes. Wild feeding ecology explains why felids search, stalk, manipulate, tear and consume prey in species-specific ways; nutritional science determines whether the food offered can meet physiological requirements; dentistry determines whether the animal can process that food; faecal monitoring reflects gastrointestinal response; and body and muscle condition reveal the longer-term balance between nutrient intake and expenditure. Accordingly, feeding should be managed as a continuous cycle of assessment, provision, observation, and adjustment rather than as a fixed meat ration.

The central principle is to feed the individual within the biological framework of its species.

When diet composition, prey structure, feeding behaviour, oral health, faecal quality, body condition, and clinical information are evaluated together, feeding becomes a powerful component of preventive medicine, welfare assessment, and long-term population management in facility-managed felids.

Table 1. Wild feeding characteristics and evidence-based translation to managed feeding.

Taxon	Wild prey / ecology	Acquisition & handling	Natural feeding pattern	Managed-care implications
Lion (<i>Panthera leo</i>)	Medium-large ungulates; prey spectrum varies with habitat.	Individual and cooperative hunting; communal carcass access can involve competition.	Large meals after kills; social access affects intake.	Use multiple access points when group-fed; monitor individual consumption and displacement; provide resistant food items for tearing/manipulation.

Tiger (<i>Panthera tigris</i>)	Frequently medium-large ungulates, including cervids, and wild pigs; opportunistic prey also documented.	Solitary stalk-and-ambush; powerful restraint; carcasses may be dragged and revisited.	Large episodic meals with variable intervals.	Use nutritionally controlled larger portions/whole-prey components where suitable; allow pulling, dragging or prolonged manipulation; do not assume cervids are the exclusive diet.
Leopard (<i>Panthera pardus</i>)	Very broad prey spectrum from small vertebrates to medium ungulates.	Solitary ambush; often transports kills; arboreal caching documented.	Meal size varies with prey; repeated use of larger kills.	Spatially variable or elevated presentation may be useful where safe; provide opportunities for carrying, pulling, and searching.
Jaguar (<i>Panthera onca</i>)	Diverse terrestrial and aquatic/semi-aquatic prey.	Ambush predator with robust cranial mechanics; head/neck bites documented.	Large meals may follow successful kills.	Provide robust manipulable items while monitoring dental wear and fracture risk; vary feeding location and structure.
Small felids	Small mammals, birds, reptiles, amphibians, and invertebrates, depending on species and habitat	Repeated detection, stalk/pounce, and capture sequences.	Generally smaller prey and potentially more frequent feeding events.	Use multiple smaller feeding opportunities, and hidden/dispersed items; avoid applying a large-felid feast-fast model indiscriminately.

Selected Scientific References

- Bagchi, S., Goyal, S. P., & Sankar, K. (2003). Prey abundance and prey selection by tigers (*Panthera tigris*) in a semi-arid, dry deciduous forest in western India. *Journal of Zoology*, 260, 285–290. <https://doi.org/10.1017/S0952836903003765>
- Bennett, C. L., Booth-Binczik, S. D., & Steele, S. R. E. (2010). Nutritional composition and digestibility by ocelots (*Leopardus pardalis*) of whole animals and a commercial diet. *Zoo Biology*, 29(6), 753–759. <https://doi.org/10.1002/zoo.20294>
- Bhandari, S. et al. (2025). Bengal tiger *Panthera tigris tigris* diet landscape: Implications for conservation and management. *Oryx*, 59(4), 515–523. <https://doi.org/10.1017/S0030605324001650>
- Biswas, S., & Sankar, K. (2002). Prey abundance and food habit of tigers (*Panthera tigris tigris*) in Pench National Park, Madhya Pradesh, India. *Journal of Zoology*, 256, 411–420. <https://doi.org/10.1017/S0952836902000456>
- D'Hooghe, S. M.-T. J. et al. (2024). How important is food structure when cats eat mice? *British Journal of Nutrition*, 131(3), 369–383. <https://doi.org/10.1017/S0007114523002039>
- Hedberg, G. E., Dierenfeld, E. S., & Rogers, Q. R. (2007). Taurine and zoo felids: Considerations of dietary and biological tissue concentrations. *Zoo Biology*, 26(6), 517–531. <https://doi.org/10.1002/zoo.20158>
- Kerr, K. R., Kappen, K. L., Garner, L. M., & Swanson, K. S. (2014). Commercially available avian and mammalian whole prey diet items targeted for consumption by managed exotic and domestic pet felines: Macronutrient, mineral, and long-chain fatty acid composition. *Zoo Biology*, 33(4), 327–335. <https://doi.org/10.1002/zoo.21147>
- Macdonald, D. W., & Loveridge, A. J. (Eds.). (2010). *Biology and conservation of wild felids*. Oxford University Press.
- National Research Council. (2006). *Nutrient requirements of dogs and cats*. National Academies Press. <https://doi.org/10.17226/10668>

- Sun, C., De Cuyper, A., Dierenfeld, E. S., & Janssens, G. P. J. (2024). Considerations on amino acid patterns in the natural felid diet: A review. *Frontiers in Veterinary Science*, 11, 1393890. <https://doi.org/10.3389/fvets.2024.1393890>
- Sunquist, M., & Sunquist, F. (2002). *Wild cats of the world*. University of Chicago Press.

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04

Reptile Feeding & Nutrition

Nutrition principles and feeding approaches across major reptile groups.

This section is intended to provide the nutritional foundation for the veterinary information that follows. Reptile nutrition cannot be reduced to a single feeding schedule or a universal diet. Dietary requirements vary with species, age, body condition, reproductive status, environmental temperature, hydration, UVB exposure, and health status. The purpose of this manual is therefore to explain the principles behind appropriate feeding, so that food selection, quantity, and supplementation can be interpreted in the context of the individual animal.

General Principles of Reptile Nutrition

Reptiles are ectothermic, and digestion and nutrient utilisation are strongly influenced by environmental temperature. Feeding should therefore be coordinated with the animal's normal activity period and with appropriate basking or water temperatures. An animal should be appropriately hydrated and thermally active before feeding. Clinically compromised, severely dehydrated or hypothermic reptiles should not routinely be fed without veterinary assessment. Food should be fresh, clean and appropriately sized, and uneaten food should be removed before it spoils or contaminates the enclosure or water. Regular monitoring of body weight and body condition, together with records of appetite, food type, quantity and abnormal feeding behaviour, provides a much more useful picture of nutritional status than appetite alone. A balanced reptile diet must provide appropriate energy, species-appropriate protein, calcium and phosphorus, vitamins and trace minerals, adequate fibre where required, water, and proper vitamin D3 availability through diet and/or UVB exposure where applicable. For many reptiles, a calcium-to-phosphorus ratio in the region of 2:1 is desirable, although the exact requirement varies with species and life stage. Supplementation should therefore be deliberate rather than indiscriminate. Excessive supplementation, particularly with fat-soluble vitamins, can itself cause disease.

Herbivorous Tortoises

For herbivorous tortoises, the foundation of nutrition is high-fibre plant material rather than fruit, high-protein vegetables or animal protein. Fibre is important because it supports the hindgut microbial population responsible for fermentation and nutrient extraction. A varied plant-based diet can include grasses and grass hay, broadleaf weeds such as dandelion and plantain, hibiscus leaves and flowers, mulberry leaves, endive, chicory and appropriate pesticide-free browse. Dark leafy greens, edible flowers and suitable commercial tortoise pellets may be used as supplementary components but should not replace the high-fibre plant base. Fruit should remain a very small component of the diet, because excessive readily fermentable carbohydrate is inappropriate for many

herbivorous tortoises. High-oxalate foods, high-protein vegetables, excessive commercial pellets, human foods and animal protein should also be limited or avoided according to species. Juveniles generally require frequent access to appropriate food, with growth monitored closely, while adult feeding should be adjusted according to species, season, body weight and body condition rather than a fixed volume. Where the base diet does not supply adequate calcium, an appropriate calcium source should be provided. UVB exposure must also be appropriate to the species and enclosure because vitamin D3 production and calcium metabolism are closely linked. Rapid growth and inappropriate nutrition can contribute to abnormal shell development and metabolic disease.

Omnivorous Turtles

Omnivorous freshwater turtles require a combination of animal and plant material, although the balance between these components can change substantially between species and life stages. Many young turtles consume proportionally more animal protein while growing and may become more herbivorous with age. A practical diet can include quality commercial aquatic turtle pellets, earthworms, appropriately sized insects, aquatic invertebrates and suitable whole prey, together with dark leafy greens, aquatic plants, appropriate vegetables and species-appropriate browse. Fruit, where naturally appropriate, should remain limited. Young turtles generally require more frequent feeding than adults, but feeding should not continue simply because an animal remains willing to eat. Excessive growth and obesity should be avoided. Because food placed directly into aquatic enclosures rapidly increases organic waste, separate feeding containers may be useful where practical. Uneaten food should be removed promptly, and filtration, water changes and water quality should be closely managed. Commercial turtle diets vary considerably in nutritional composition, so their formulation should be evaluated rather than assuming that all pellets are nutritionally equivalent.

Piscivorous Turtles

Piscivorous turtles are best maintained on whole prey or nutritionally complete formulated diets rather than a diet based primarily on muscle meat. Appropriate foods may include whole fish, commercial aquatic turtle diets formulated for carnivorous species, shrimp and other suitable invertebrates, and other whole aquatic prey. Whole prey provides a more appropriate combination of protein, fat, minerals, bone, organ tissue and micronutrients. Feeding only fish fillets or pieces of muscle creates a nutritionally incomplete diet. Frozen-thawed fish can be useful, but frozen fish should not automatically be considered nutritionally complete. Where fish form a substantial proportion of the diet, particular attention may be required to thiamine and vitamin E, especially when fish with thiaminase activity are involved. Feeding frequency should be adjusted according to species, age, water temperature, activity, body condition and growth rate, and excessive feeding should be avoided simply because aquatic turtles readily accept food.

Crocodilians

Crocodilians are primarily carnivorous predators, but their nutritional requirements are better met through variety and whole-prey feeding than through a diet based exclusively on one type of meat. Depending on species and size, suitable food categories include whole fish, whole rodents, poultry, rabbit, other appropriately sized whole vertebrate prey, suitable invertebrates for juveniles or particular species, and validated commercial crocodilian diets where available. Whole prey provides bone-derived minerals, organ tissue, appropriate protein and fat, and a broader range of micronutrients. Large quantities of boneless muscle meat, processed meat, sausages, cooked human food and seasoned meat should be avoided. Juveniles generally require more frequent feeding because of growth demands, whereas large adults are usually fed less frequently, with portion size determined by body condition and environmental conditions. Where aggression is possible, animals should be fed individually, feeding tools should be used appropriately, food should not be left to decompose in water, and excellent filtration and water hygiene should be maintained.

Insectivorous Lizards

Insectivorous lizards, including many geckos, anoles, chameleons, skinks and small agamids, should receive a varied selection of appropriately sized feeder invertebrates. Crickets, locusts, roaches, silkworms, black soldier fly larvae, mealworms, superworms, waxworms and, where appropriate, earthworms can all form part of the feeding programme. No single feeder insect should be assumed to provide a complete diet. Many commonly used feeder insects have an unfavourable calcium-to-phosphorus ratio and are relatively phosphorus-heavy. Nutritional management therefore begins with the feeder insect itself. Insects should be properly maintained and gut-loaded with a nutritious, appropriate diet rather than merely being kept alive until they are offered. Calcium and mineral supplementation should then be selected according to the species, base diet and UVB exposure. Small and juvenile lizards may require daily or near-daily feeding, while adults are commonly fed every one to three days depending on species and metabolism. Large insectivorous species may require less frequent meals. Body condition should guide adjustments rather than appetite alone.

Carnivorous Lizards

Predominantly carnivorous lizards, including monitor lizards and other carnivorous species, are best fed a varied whole-prey diet where appropriate. Depending on species and size, suitable prey can include rats, mice, chicks, quail, rabbit, whole fish, invertebrates, eggs and other appropriately sized whole prey. Prey size must be matched carefully to the animal. A diet consisting primarily of chicken breast, minced meat, beef or other isolated muscle meat is nutritionally incomplete because it does not reproduce the mineral, organ and micronutrient profile of whole prey. Large carnivorous lizards often do well with relatively infrequent meals, whereas juveniles and rapidly growing animals require more frequent feeding. Large adults may be fed approximately once or twice weekly depending on species, prey size, temperature and body condition. Carnivorous reptiles can be highly food-motivated, but a strong feeding response does not necessarily mean that additional food is required. Obesity and excessive growth should be avoided.

| Snakes: Rodent- and Whole-Prey-Based Feeding

Most commonly maintained snakes can be successfully fed a whole-prey rodent-based diet when this is appropriate for the species. Depending on species and size, prey may include pinkies and fuzzies, adult mice, rat pups, adult rats, multimammate mice, hamsters, guinea pigs, chicks, quail and rabbits. Prey size must be appropriate for the snake's size and feeding strategy. The nutritional advantage of whole prey is that muscle, bone, organs and other tissues are consumed together rather than isolated from one another. Frozen-thawed rodents are generally preferred in managed collections because they reduce the risk of injury to the snake and simplify storage and handling. Prey should be stored appropriately frozen, thawed under refrigeration, warmed before offering and presented with appropriate feeding tools. Feeding behaviour should be observed and uneaten prey removed promptly. Frozen rodents should be stored under appropriate freezer conditions; prolonged storage can reduce nutritional quality. Feeding frequency varies greatly with species and age, with neonates and juveniles generally requiring smaller and more frequent meals, growing snakes requiring regular meals, and adults often taking larger meals at longer intervals. Large constrictors may naturally be fed relatively infrequently. The aim is appropriate growth and body condition rather than maximising feeding frequency.

| Snakes with Specialised Ectothermic Prey Requirements

Not all snakes should be assumed to thrive on rodents. Some species naturally specialise in ectothermic prey such as fish, amphibians, reptiles and other cold-blooded animals. Examples include garter snakes, hognose snakes, some natricines, king cobras and other specialised ophiophagous species. While some specialised feeders can be transitioned partly or completely to mammalian prey, others have nutritional requirements that are more closely tied to their natural prey spectrum. Diet planning should therefore begin with an understanding of the species' natural feeding ecology rather than assuming that a rodent-based diet is universally appropriate. Depending on species, suitable prey categories may include fish, amphibians, lizards, other snakes, aquatic invertebrates and validated specialist commercial diets. Fish should not be selected simply because they are readily available. The species of fish, nutritional composition, thiaminase activity, fat content, calcium content, whether whole prey is being offered and the long-term variety of the diet all require consideration. A diet composed predominantly of nutritionally inappropriate fish can lead to vitamin and mineral deficiencies. Specialised diets should therefore be assessed as complete feeding programmes rather than as a series of convenient prey items.

| Supplementation

Supplementation should be used to correct predictable nutritional gaps in the complete diet, not as a substitute for appropriate food selection, UVB exposure, hydration or thermoregulation. Requirements vary substantially between species and depend on the composition of the base diet, prey type, life stage, reproductive status and access to UVB. A balanced whole-prey diet may require little or no routine supplementation, whereas insectivorous reptiles commonly require additional calcium because many feeder insects have an unfavourable calcium-to-phosphorus ratio. Calcium

supplementation is particularly important for growing, gravid and egg-producing reptiles when dietary calcium is insufficient. Calcium carbonate or other appropriate preparations may be used, with a dietary calcium-to-phosphorus ratio of approximately 1.5–2:1 being desirable for many reptiles, although species-specific requirements vary. Insectivorous reptiles should receive appropriately calcium-loaded prey and, where necessary, calcium dusting. Vitamin D3 supplementation should always be considered in relation to UVB exposure. Species receiving adequate biologically effective UVB may synthesise vitamin D3 cutaneously and should not receive excessive dietary D3. Species without appropriate UVB may require dietary D3, but dosing must remain conservative because chronic excess can result in hypervitaminosis D, soft-tissue mineralisation and other serious disease. Broad-spectrum multivitamins and trace minerals may be appropriate when the base diet is known to be deficient, particularly in insectivores maintained on nutritionally incomplete prey. Routine high-dose supplementation should be avoided because fat-soluble vitamins A, D, E and K can accumulate and become toxic. Vitamin A requires particular caution because both deficiency and excess can cause disease. For insectivorous reptiles, supplementation begins with the feeder insect itself. Insects should be maintained and gut-loaded with a nutritionally appropriate diet before being offered. Dusting immediately before feeding can provide additional minerals but cannot compensate for poorly nourished feeder insects. Fish-eating reptiles may require particular attention to thiamine and vitamin E when frozen-thawed or thiaminase-containing fish form a substantial part of the diet. Piscivorous crocodilians and other fish-dependent reptiles should therefore receive a diverse selection of appropriate fish or a validated supplemented diet.

The practical rule is that supplementation should be based on the nutritional analysis of the complete diet rather than simply on the species name.

The goal is to provide sufficient calcium, vitamins and trace minerals while avoiding chronic excess. In managed collections, supplementation protocols should specify the product, concentration, dose, frequency, prey or food category and life stage, and should be reviewed periodically as diet and husbandry change.

Feeding Records, Body Condition and Clinical Monitoring

Feeding should be treated as a measurable component of reptile husbandry. Where practical, individual records should include the date food was offered, the exact prey or food type, quantity, whether it was accepted, regurgitation, defecation, body weight, body condition and relevant behavioural observations. Weight is one of the most useful objective measures of nutritional status. Sudden weight loss, failure to gain weight, excessive weight gain, changes in feeding behaviour or repeated regurgitation should prompt investigation rather than simply increasing or decreasing the amount of food. The same principle applies to persistent anorexia, abnormal faeces, diarrhoea or poor growth.

Putting the Principles Together

The central principle of reptile nutrition is to feed for the species rather than simply for the taxonomic group. A diet should reflect the animal's natural feeding ecology while being adapted to the realities of captivity. Whole prey is generally superior to isolated muscle meat, but variety is useful only when that variety remains nutritionally appropriate. Calcium, vitamins and minerals should be calculated in relation to the complete diet rather than added indiscriminately. Environmental temperature, hydration and UVB can determine whether an otherwise appropriate diet is successfully digested and utilised, and body weight, body condition, growth rate and faecal output should guide feeding adjustments. Finally, a reptile that eats aggressively is not necessarily a reptile that requires more food. Persistent nutritional or digestive abnormalities should be investigated rather than managed by repeatedly changing the diet.

Transition to Veterinary Nutrition and Clinical Management

The principles above provide the foundation for evaluating reptile nutrition in clinical and collection settings. The veterinary sections that follow can then be used to interpret these principles in the context of disease, nutritional deficiencies, metabolic disorders, growth abnormalities, reproductive demands, anorexia, gastrointestinal disease and other clinical presentations. In practice, the correct diet is not determined by food choice alone; it is the interaction between diet, supplementation, husbandry, thermoregulation, hydration, UVB exposure, life stage, body condition and health status that determines nutritional outcome.

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Food Safety, Hygiene and Microbial Control in Zoo Diet Preparation

Introduction

The nutritional value of a diet can be compromised if food is poorly handled, stored or prepared. In zoological facilities, animal diets may include fresh produce, grains, dairy products, eggs, meat, fish, whole prey, insects and specially prepared feeds. These materials can support microbial growth or become contaminated at any stage between receiving and feeding.

Food safety therefore forms an essential part of animal nutrition and welfare. The objective is to maintain the quality and safety of food throughout its journey from receiving to preparation, storage, dispatch and feeding. Every stage should be controlled through appropriate hygiene, temperature management, prevention of cross-contamination, traceability and documentation.

The principles can be organised around five fundamental controls: keep clean; separate raw and cooked foods; cook thoroughly where cooking is required; maintain food at safe temperatures; and use safe water and raw materials. These principles form the WHO's internationally recognised Five Keys to Safer Food and provide a useful foundation for zoo diet kitchens. (World Health Organization)

WHO Five Keys to Safer Food

1 · Keep clean

2 · Separate raw and cooked

3 · Cook thoroughly

4 · Keep food at safe temperatures

5 · Use safe water and raw materials

1. Receiving and Quality Inspection

Food safety begins when ingredients enter the facility. Each delivery should be inspected before acceptance. Staff should verify:

- Freshness, appearance, odour and physical condition
- Packaging integrity and cleanliness
- Use-by/expiry dates and batch information
- Evidence of spoilage, mould, pest activity or contamination
- Appropriate temperature of chilled and frozen products
- Condition of meat, fish, eggs, dairy products and fresh produce

- Supplier and delivery records where traceability is required

Food that is spoiled, damaged, contaminated, improperly packaged or outside the facility's defined acceptance criteria should be rejected or isolated for assessment.

Receiving records should identify the date, supplier, product, quantity, batch where applicable, temperature and acceptance/rejection decision. This creates traceability if a food-safety concern subsequently occurs.

2. Preparation and Personal Hygiene

Food preparation areas should be designed and managed to minimise contamination. Staff should maintain appropriate personal hygiene and follow defined procedures for handwashing, protective clothing and handling of food.

Preparation should include:

- Clean and sanitised work surfaces
- Clean utensils, knives, cutting boards and containers
- Safe water for washing and preparation
- Separation of raw animal products from ready-to-feed foods
- Controlled movement of personnel and materials
- Regular cleaning and sanitation of equipment
- Protection of food from insects, rodents and other pests

Raw meat, fish, eggs and other high-risk ingredients should be handled separately from foods that will be fed without further treatment. WHO recommends using separate equipment and utensils for raw and cooked foods and storing foods in a manner that prevents contact between raw and prepared products. (World Health Organization)

3. Cooking and Heat Treatment

Where cooking is part of an animal's approved diet, the process should be controlled using validated procedures appropriate to the food and intended animal species.

Cooking should:

- Achieve the required internal temperature throughout the product
- Be verified using a calibrated food thermometer where appropriate
- Prevent undercooking of high-risk foods
- Avoid contamination after cooking
- Include safe handling during transfer, portioning and storage

WHO identifies thorough cooking as a key control for reducing dangerous microorganisms and recommends the use of a thermometer where appropriate. Its general guidance uses 70°C as a benchmark for thoroughly cooked foods such as soups and stews, while zoo facilities should establish food-specific procedures according to the relevant food type, institutional risk assessment and applicable regulations. (World Health Organization)

4. Cooling and Chilling

Cooked or prepared food that is not immediately fed should be cooled and stored promptly. Large volumes should not be left to cool slowly at room temperature.

Good practice includes:

- Dividing large quantities into smaller portions where appropriate
- Using suitable shallow containers to facilitate cooling
- Protecting food from contamination during cooling
- Recording cooling temperatures where required
- Moving food promptly into controlled refrigeration
- Avoiding prolonged exposure to ambient temperatures

WHO recommends prompt refrigeration of cooked and perishable foods, preferably below 5°C, and advises against leaving cooked food at room temperature for extended periods. (World Health Organization)

5. Chilled and Frozen Storage

Storage areas should maintain appropriate temperatures and prevent cross-contamination.

Key controls include:

- Continuous or scheduled temperature monitoring
- Separate storage of raw and prepared foods
- Covered and labelled containers
- Clear identification of preparation date and use-by date
- FIFO/FEFO stock rotation
- Avoiding overloading of refrigerators and freezers
- Maintaining an organised storage hierarchy
- Safe thawing of frozen food
- Preventing repeated freeze-thaw cycles where this affects food safety or quality

Raw meat, fish and other products capable of releasing contaminated fluids should be securely wrapped or stored in sealed containers and positioned to prevent contamination of other foods. WHO recommends keeping refrigerators below 5°C for perishable foods, while recognising that refrigeration slows rather than completely stops microbial growth. (World Health Organization)

6. Dispatch and Feeding

The food-safety chain continues after preparation and storage. Diets should be transported to animal areas in clean, appropriate and identifiable containers.

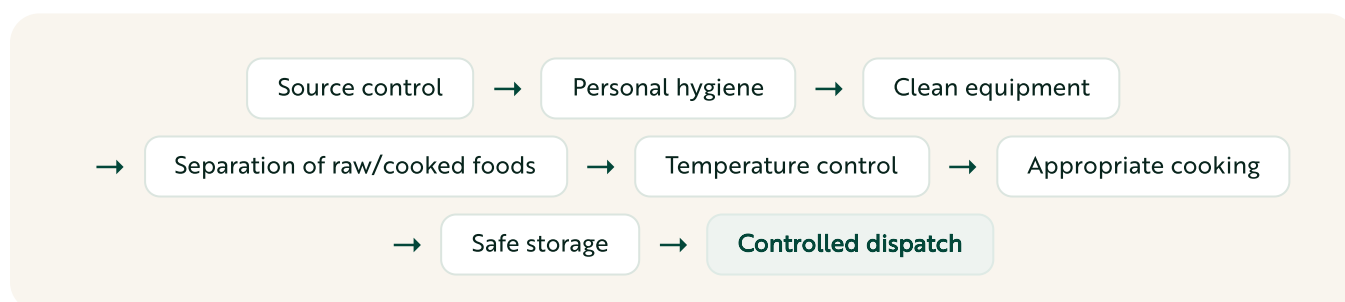
Before dispatch, staff should verify:

- Animal or enclosure identification
- Diet type and quantity
- Required preparation or supplementation
- Dispatch time
- Temperature requirements
- Container cleanliness and integrity

The interval between preparation, dispatch and feeding should be controlled according to the food type and facility procedure. Food should be protected from environmental contamination, pests, excessive heat and inappropriate exposure during movement to the animal.

7. Microbial Control and Cross-Contamination

Microbial hazards may arise from raw ingredients, contaminated surfaces, equipment, water, hands, pests or contact between raw and prepared foods. Contamination can occur even when food appears normal.



Attention should be given to high-risk foods such as raw meat, fish, eggs, dairy products, prepared diets and foods with high moisture content.

Cleaning removes food residues and organic matter; sanitisation is an additional control intended to reduce microorganisms to an acceptable level. Both should form part of a documented cleaning programme.

8. Monitoring, Records and Corrective Action

Food-safety controls should be measurable and documented. Records may include:

- Receiving temperatures
- Refrigerator/freezer temperatures
- Cooking temperatures
- Cooling records
- Cleaning and sanitation schedules
- Food rejection records
- Batch/lot information
- Diet preparation records

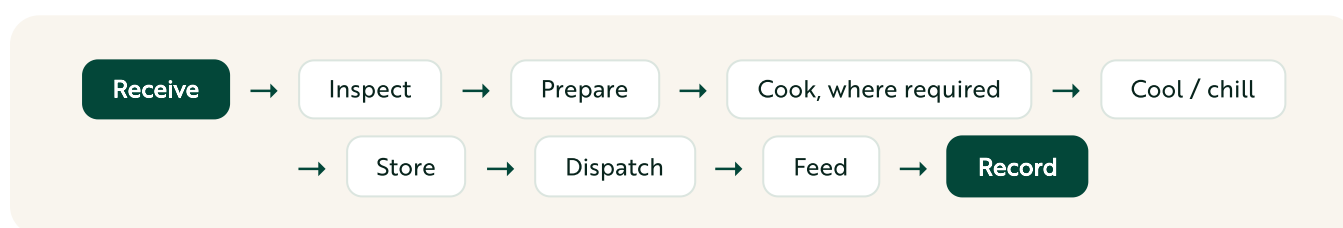
- Dispatch records
- Food-safety incidents and corrective actions

Where a critical limit or institutional standard is not met, the affected food should be identified and held for assessment. Depending on the risk, corrective action may include additional treatment, restricted use, disposal, supplier notification, equipment inspection or veterinary/management review.

Food-Safety Principle

The diet is only as safe as the weakest point in its journey.

A nutritionally complete diet can still become unsafe through contaminated ingredients, poor hygiene, inadequate cooking, temperature abuse, cross-contamination or improper storage. Food safety should therefore be managed as a continuous process:



At every stage, the facility should maintain hygiene, temperature control, microbial control, traceability and accountability.

The ultimate objective is simple: every animal should receive the correct diet, in the correct quantity and condition, safely and consistently.

References

- European Association of Zoos and Aquaria. (n.d.). *EAZA population management manual*.
- European Association of Zoos and Aquaria. (2024). *EAZA standards for welfare, accommodation and management of animals in zoos and aquariums*.
- FAO & WHO. (2023). General principles of food hygiene (Codex Alimentarius Code of Practice No. CXC 1-1969). Codex Alimentarius Commission. <https://doi.org/10.4060/cc6125en>
- World Health Organization. (n.d.). *Public health advice on food safety*.
- World Health Organization. (2006). *Five keys to safer food manual*. <https://www.who.int/publications/i/item/9789241594639>

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Food Presentation, Feeding Enrichment and Behavioural Welfare

Introduction

In managed wildlife care, nutrition should be considered not only in terms of what an animal eats, but also how, where and when food is provided. In the wild, feeding is an active behavioural process involving searching, locating, selecting, capturing, manipulating and processing food. For carnivores, these processes may occupy substantial portions of the animal's behavioural repertoire. Conventional captive feeding, in contrast, can reduce much of this complexity when food is provided at a fixed time, in a predictable location and in an easily consumed form.

Food presentation and feeding enrichment can help restore some of these behavioural opportunities. Appropriate strategies can encourage exploration, searching, manipulation, physical activity and species-typical feeding behaviour while simultaneously making routine husbandry more dynamic.

Research in captive felids supports the importance of considering feeding practices as part of welfare management. In Indian leopards, feeding time has been shown to influence the behavioural repertoire, with changes in activity occurring around predictable feeding periods. Studies have also demonstrated relationships between enclosure characteristics, enrichment, stereotypic behaviour and physiological indicators of stress.

Importantly, enrichment should not be equated automatically with improved welfare. Its effectiveness depends on the type of enrichment, its duration, individual response, enclosure context and the animal's previous experience. A well-designed feeding programme should therefore combine nutritional adequacy, behavioural opportunity, individual monitoring and appropriate variation.

Food Presentation as Behavioural Enrichment

Food presentation is the deliberate modification of the form, location, distribution or accessibility of an animal's normal diet to encourage species-appropriate behaviour.

For carnivores such as leopards, food may be presented in ways that encourage:

- Searching and locating food;
- Climbing and reaching;
- Pulling and manipulating;
- Tearing and processing;
- Investigation of novel locations;
- Olfactory exploration;
- Movement between feeding sites; and
- Problem-solving and choice.

The nutritional composition of the ration should remain controlled. Enrichment should preferably use food already included within the prescribed diet, with the total daily ration adjusted so that enrichment does not inadvertently increase caloric intake.

Spatial Food Presentation

Instead of placing the entire ration at one predictable feeding point, appropriate portions may be distributed through different areas of an enclosure. Food can be positioned at ground level, elevated locations or within safe naturalistic structures according to the animal's abilities and enclosure design.

For leopards, examples may include placing suitable meat portions on elevated platforms, suspending food from secure structures, positioning food near logs or rocks, or concealing appropriately sized pieces within safe crevices. Such arrangements encourage movement and investigation and can provide opportunities to express behaviours associated with locating and obtaining food.

Spatial distribution should always be designed so that food remains accessible to the individual, can be retrieved without injury, and can be accounted for by keepers.

Structural and Processing Enrichment

Food can also be presented in forms that increase the time and behavioural effort required for consumption. Suitable examples include larger pieces, appropriately prepared whole food items, feeding devices, frozen food items or food placed within safe natural materials.

Research on large felids has demonstrated that feeding enrichment can increase the variety and frequency of feeding behaviours. In a study involving African lions and Sumatran tigers, presentation of fish and horse-leg bones increased feeding-related behaviours and reduced stereotypic behaviour; the reduction associated with fish presentation persisted for up to two days in the tigers studied.

Such findings support the principle that feeding should, where appropriate, provide opportunities for behavioural processing rather than simply delivering nutrients as efficiently as possible.

Food Enrichment and Rescued Indian Leopards

A particularly relevant example is the GZRRC study, "Effect of a Food Enrichment and a Variable Feeding Time on the Behavioural Welfare of Rescued Leopards (*Panthera pardus*) at an Indian Rescue Centre." The study evaluated 13 rescued leopards, comprising nine males and four females, housed at the Greens Zoological Rescue and Rehabilitation Centre in Jamnagar. The leopards were maintained in spacious enclosures of approximately 800–1,200 m² with vegetation, species-specific features and enrichment.

The study compared a baseline condition involving on-time feeding with a subsequent condition involving food enrichment and variable feeding times. Behavioural observations were collected using focal animal sampling, with 15-minute observation periods for each individual around feeding.

Particular attention was given to food-anticipatory pacing and agonistic interactions between conspecifics.

During the variable-feeding phase, feeding occurred once daily, six days per week, with feeding times randomised within the management-defined schedule. The study therefore examined not simply the effect of enrichment objects, but the combined effect of food-based enrichment and reduced predictability of feeding time.

The findings were notable. Food-anticipatory pacing declined from a mean of 158.43 seconds during the on-time feeding condition to 5.33 seconds under the variable feeding and enrichment condition. The difference was statistically significant (Wilcoxon signed-rank test, $V = 587$, $p < 0.001$), with a reported large effect size ($d = 1.25$). Conspecific-directed agonistic interactions also declined, from a mean of 36.12 seconds to 7.76 seconds, with a statistically significant difference ($V = 620$, $p < 0.001$; $d = 1.34$).

Food-anticipatory pacing (mean)

158.43 s → 5.33 s

Wilcoxon signed-rank, $V = 587$, $p < 0.001$; $d = 1.25$

Conspecific-directed agonistic interactions (mean)

36.12 s → 7.76 s

$V = 620$, $p < 0.001$; $d = 1.34$

These results suggest that modifying feeding predictability and providing food-based behavioural opportunities may substantially alter feeding-related behaviour in rescued leopards. They are particularly relevant to rescue centres because animals may spend long periods under managed care following rescue, rehabilitation or permanent placement.

The study should, however, be interpreted appropriately. Because food enrichment and variable feeding time were introduced together, the results do not establish that either intervention independently caused the observed changes. Nevertheless, the findings provide strong practical evidence supporting the integration of feeding enrichment and carefully managed temporal variation into leopard husbandry.

Feeding Time and Food-Anticipatory Behaviour

Predictable feeding schedules can produce food-anticipatory behaviour. Animals may begin moving, pacing or becoming increasingly active before the expected feeding event. Such anticipation is not inherently negative. Anticipatory behaviour can represent motivation and positive expectation; however, excessive repetitive pacing or prolonged pre-feeding agitation may indicate that the feeding routine has become an important source of behavioural restriction or frustration.

Research on zoo animals has proposed anticipatory behaviour as a potentially useful behavioural indicator because it reflects an animal's sensitivity to predictable rewards and changes in the animal's behavioural state around those events.

Research specifically involving Indian leopards found that feeding time influenced their behavioural repertoire and that resting was lower during periods preceding feeding. However, stereotypic pacing was more strongly associated with enclosure characteristics than with feeding time alone. This is important because it demonstrates that feeding management should be considered as one component of a broader welfare programme, rather than as a stand-alone solution to stereotypic behaviour.

Accordingly, variable feeding times should be used thoughtfully. The purpose is not to create uncertainty or frustration, but to prevent excessive dependence on a highly predictable feeding event while maintaining appropriate nutritional and husbandry routines.

Evidence from Indian Leopard Welfare Research

Evidence from other Indian leopard studies further supports the integration of environmental and feeding enrichment into routine management.

Panchal, Desai and Ghosal studied 14 captive Indian leopards housed under three different enrichment regimes in two Gujarat zoos and compared faecal glucocorticoid metabolite concentrations with those of free-ranging leopards. The study found differences in physiological stress indicators between enrichment and housing categories and identified enclosure size as an important factor influencing the physiology of the sampled captive leopards.

The authors also reviewed earlier evidence showing that Indian leopards displayed stereotypic behaviours such as repetitive walking, paw chewing and snapping under some captive conditions, with reductions associated with structural enrichment and increased keeper interaction.

This evidence reinforces an important principle for diet management: food enrichment should complement, rather than replace, appropriate enclosure design, environmental complexity, social management, veterinary care and positive human-animal interactions.

Recent research on zoo-housed felids similarly indicates that sensory and food enrichment are among the most frequently studied enrichment approaches and are generally associated with positive effects on activity, foraging and stereotypic behaviour. At the same time, the effects vary according to species, enrichment type and individual characteristics, highlighting the importance of individual assessment rather than applying a single enrichment protocol universally.

Practical Applications in Diet Management

Food-based enrichment can be incorporated into routine feeding plans without compromising nutritional control. Examples include:

Foraging and searching

- Scatter appropriate portions of the daily ration across selected areas.
- Place food at multiple feeding points.
- Conceal food in safe and accessible locations.
- Use natural enclosure features to encourage searching.

Climbing and reaching

- Place suitable food portions on secure elevated structures.
- Suspend food using professionally designed, safe feeding devices.
- Vary feeding height where appropriate for the species and individual.

Manipulation and processing

- Provide suitably sized pieces that require pulling, tearing or manipulation.
- Use appropriate food-based puzzle feeders.
- Incorporate frozen food enrichment where medically and nutritionally appropriate.

Olfactory investigation

- Use the natural odour of food to stimulate searching.
- Where additional scents are used, ensure that they are non-toxic and species appropriate.

Temporal variation

- Vary feeding times within an approved management window where appropriate.
- Avoid rigid association of feeding with a single exact time.
- Maintain predictable veterinary, medication and essential husbandry requirements.

Social feeding

- Provide multiple feeding locations where animals are housed socially.
- Ensure subordinate individuals have equitable access to the prescribed ration.
- Monitor aggression, food guarding and displacement.

Monitoring and Evaluation

Every food enrichment programme should have a defined behavioural objective and should be evaluated systematically. Keepers and animal-care teams should record:

- duration and frequency of engagement;
- feeding and food-processing behaviour;
- exploratory activity;
- locomotion;
- resting;
- stereotypic behaviour;

- pacing before feeding;
- aggression or agonistic interactions;
- food consumption and leftovers;
- individual differences in response; and
- any signs of frustration, avoidance or injury.

Where resources permit, behavioural observations can be supplemented with physiological indicators such as faecal glucocorticoid metabolites, body condition, health parameters and other validated welfare measures.

Enrichment should be modified when an animal shows persistent avoidance, frustration, excessive competition or no meaningful engagement. Conversely, enrichment that produces appropriate exploratory and feeding behaviour can be incorporated into a rotating programme to reduce habituation.

| Safety and Nutritional Control

Behavioural enrichment must never compromise dietary or veterinary requirements. All food-based enrichment should be:

1. Nutritionally accounted for within the daily ration.
2. Veterinarily appropriate for the animal's health condition.
3. Free from choking, obstruction and injury hazards.
4. Hygienically prepared and presented.
5. Securely installed when elevated or suspended.
6. Appropriate to the animal's physical abilities and age.
7. Monitored for competition in socially housed animals.
8. Documented so that consumption and behavioural responses can be assessed.

Particular care is required for rescued animals with previous nutritional deficiencies, gastrointestinal disease, dental problems, injuries, neurological conditions or other medical limitations. In such cases, enrichment should be adapted to the individual's clinical status.

| Key Principle

The goal of food enrichment is not to make animals work for food unnecessarily. The goal is to make feeding more biologically meaningful.

A successful feeding programme therefore balances four elements:

Nutritional adequacy

+

Behavioural opportunity

+

Individual choice

+

Welfare monitoring

The experience from rescued Indian leopards at GZRRC demonstrates the potential value of combining food enrichment with carefully managed variation in feeding time. When integrated with appropriate enclosure design, environmental complexity, veterinary care and behavioural monitoring, food presentation can transform routine feeding from a simple nutritional event into an important opportunity for foraging, exploration, physical activity, cognitive engagement and positive welfare.

For rescue centres and zoological institutions, the practical objective should be to ensure that every feeding programme answers two questions:

**Is the animal receiving what it needs
nutritionally?**

**And is the way we provide it allowing
the animal to express appropriate
behaviour?**

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Nutrition and Feeding Management of Cheetahs

Key principles and practical guidance for zoo veterinarians

Cheetahs are meat-eating animals adapted to eating different parts of their prey, with gaps between meals. Good nutrition depends on what cheetahs eat, how much they eat, how often they eat and the quality of the food. Enough meat may provide enough protein and energy but still leave important nutrients missing. Feeding must also meet the needs of growing, breeding or sick animals.

Follow Natural Feeding Patterns

Wild cheetahs eat large meals followed by periods without food. Feeding less often, with larger meals, follows this natural pattern and allows the stomach to empty between feeds. This may support digestion and the body's use of energy, but its effects on long-term disease are still uncertain. Each animal must receive enough food over the week. For healthy adults, aim for two feeds per week where possible, or three smaller meals. A starting guide is 20–25% of body weight eaten per week. For a 35–40 kg adult, this means 7–10 kg per week, or 3.5–5 kg per meal when feeding twice weekly. Measure food eaten, allowing for bones, skin or other parts left behind. Adjust amounts for activity, weather, breeding and body condition. Some animals need daily feeding for medical or management reasons.

WEEKLY GUIDE

20–25%

of body weight eaten per week

35–40 KG ADULT

7–10 kg

per week

TWICE WEEKLY

3.5–5 kg

per meal

Provide the Different Parts of Whole Prey

Muscle meat alone does not provide a complete diet. Bone supplies calcium and phosphorus. Organs supply vitamins and minerals. Blood supplies sodium. Skin, cartilage and connective tissue supply collagen, which is rich in the amino acid glycine. Glycine helps the body make creatine and glutathione and process some harmful substances. A diet can be high in protein but still lack the balance of amino acids found in whole prey. Fat supplies energy and helps the body absorb some vitamins. Both the type and freshness of fat matter. Fat from ruminants, such as goats and sheep, is less likely to oxidise during storage than poultry fat. Do not routinely trim it away. The suggested links

between glycine, fat type and gut or inflammatory disease are not yet proven. Use small ruminant carcasses where possible, especially young or small goats. Remove the rumen and intestines but leave the skin on. Choose short-haired animals to reduce the amount of hair swallowed. Carcasses encourage chewing and natural feeding behaviour. When preparing a diet from separate parts, include this same variety of tissues. Muscle meat should make up no more than about half the diet by weight. Introduce new foods gradually. Avoid using broiler chicken as the main food. It may supply too little copper, calcium and connective tissue. Other concerns include fat oxidation, harmful bacteria and avian influenza. If poultry must be used, add suitable ruminant tissues and supplements to balance the whole diet.

Part of whole prey	What it supplies
Bone	Calcium and phosphorus
Organs	Vitamins and minerals
Blood	Sodium
Skin, cartilage and connective tissue	Collagen, which is rich in the amino acid glycine
Fat	Energy, and helps the body absorb some vitamins

Check What Each Animal Actually Eats

Supplements should replace nutrients missing from the diet. Offering a whole carcass does not ensure a balanced diet if the animal leaves the bone or organs. Complete carcass diets may need few supplements. Where the diet does not provide complete whole-carcass nutrition, use Wildcat Nutrition - Premium Cheetah Supplement to help balance it. Use their CalciCare Supplement where calcium intake is insufficient, especially when cubs cannot eat enough bone. Follow the product directions and account for nutrients already supplied by the diet and other supplements.

When carcasses have been bled at slaughter, add about 2.5 g iodised table salt per kg of meat fed. Allow for salt already supplied in the diet or supplements. Carcasses that retain their blood generally need no extra salt. Check body condition and muscle cover regularly, and weigh animals when possible. Look for a clear waist, a tucked abdomen and ribs that can be felt but do not stand out. Follow changes over weeks, since weight changes after a large meal. Use the feeding amounts above as guides and adjust them to the animal.

Meet the Changing Needs of Growing Cubs

Young cubs need a different feeding plan from adults. Milk provides nutrients before cubs can eat enough carcass tissues, especially bone. When milk intake falls, other foods must replace these nutrients. Eating enough meat does not mean a cub is getting enough minerals. Cubs raised by their mother start nibbling carcasses at about five weeks. Milk remains important until about five to six

months. Check the mother's condition and milk supply, and follow each cub's growth, especially in litters of four or five. If needed, give extra daily feeds between carcass meals. Start with finely minced meat, then move to small cubes. Balance all extra meat feeds with a suitable vitamin and mineral supplement. Hand-reared cubs and those weaned early may stop receiving milk before they can eat enough bone. Use CalciCare to help meet calcium needs during this period, and check that the diet also provides enough phosphorus and other nutrients. Reduce extra feeds as cubs eat enough from carcasses, usually from five to six months. Move towards two or three feeds per week at about seven to eight months, depending on growth and the cubs' ability to eat carcass tissues.

Prevent Nutrient Deficiencies and Recognise Warning Signs

Calcium

Too little calcium, or a poor calcium-to-phosphorus balance, can cause metabolic bone disease. Signs include weak or deformed bones, lameness and fractures. Cubs must eat enough bone or receive a correctly balanced alternative.

Vitamin A and copper

Check diets that lack organs, especially liver. Vitamin A deficiency may cause weakness, weak hindlimbs, a stiff neck and changes in walking. Copper deficiency may cause weakness, poor coordination, anaemia and poor coat quality. Other diseases can cause similar signs.

Thiamine or vitamin B1

Deficiency may cause poor coordination, changes in mental state, seizures or severe weakness. Consider it with unsuitable fish-based diets or poorly stored food.

Magnesium

Too little magnesium is a concern during weaning, hand-rearing and illness, especially with incomplete meat diets. Signs may include tremors, weakness, low blood potassium, abnormal heart rhythms and collapse. Blood magnesium may not show the amount stored in the body. Prevent shortages with a complete diet or suitable supplement. Choose the product and amount according to the whole diet.

Make Food Safety Part of Feeding Management

Even a balanced diet can cause illness if the food is spoiled, contaminated or contains drug residues. Safe sources, fresh food and clean handling are essential. Use animals with known health and treatment histories. Follow drug withdrawal periods before using their carcasses. Check for risks from anti-inflammatory drugs, antibiotics, parasite treatments and sedatives. Never feed carcasses of

animals killed with euthanasia drugs. Use clean slaughter areas and equipment. Keep gut contents away from edible tissues when removing the digestive tract. Bleed animals promptly at slaughter and replace the lost sodium as described above. Cool carcasses quickly and refrigerate at 0–4 °C. Freeze food that will not be used soon. Thaw it in a refrigerator and feed it promptly. Avoid long storage and repeated thawing and refreezing. Take extra care with organs fed to cubs. Use clean, separate equipment and offer small portions. Remove uneaten food promptly. Reject food with an unusual smell, colour or slimy surface. Gut illness in young cubs can quickly lead to dehydration, low blood glucose and poor growth.

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08

The Well-Fed Mind: The Application of Animal Welfare and Ethics in Wildlife Nutrition

Toward an Applied Welfare-and-Ethics Framework for Wildlife Nutrition in Human Care — a discussion chapter on the mental, physical, and ethical dimensions of feeding animals in human care

Introduction

What does an animal really need from his or her food? The easy answer is enough of it, and the right kind. Balanced protein, fat, vitamins and minerals, the right number of calories for his or her age and life stage – this side of nutrition is well understood and well checked by professionals everywhere. But there's a second question that hardly ever gets asked in the same breath: does the animal enjoy his or her food, or is it just getting enough to get by? This paper takes that second question seriously, as a real welfare issue rather than a nice-to-have. It rests on two simple ideas. The first is welfare, using the Five Freedoms, a well-known and widely respected framework, to make the point that an animal's food should satisfy him or her mentally as well as physically, not just keep him or her alive. The second is ethics, using cost–benefit thinking, which simply means weighing what something costs against what it gives back, to work through the harder decisions about how animals are fed, especially when feeding one animal means another animal has to die. Neither idea is offered here as the final word. The goal is to open this conversation, not to close it down with a tidy answer. It's also worth being upfront about what is genuinely new here and what isn't. Other researchers have already written about the mental side of feeding, about the Five Freedoms and the newer Five Domains model, about the ethics of live feeding for exotic pets, and about feeder insects specifically (Fischer, 2025). This chapter doesn't claim to be first to raise any of those ideas on its own. What does seem to be missing from the existing research is a single chapter that brings welfare and ethics together this way: using the Five Freedoms to look specifically at the mental side of feeding, and cost–benefit thinking to work through feeding decisions, across zoological collections and conservation-breeding programmes alike. That combination, not any one piece of it by itself, is what this paper adds.

Part I – Welfare: What the Five Freedoms Actually Commit Us To

1.1 Freedom from hunger and thirst was never only physical

The Five Freedoms came from the UK's 1965 Brambell Report and were later adopted internationally by the World Organisation for Animal Health (WOAH). "Freedom from hunger and thirst" is the first of

the five freedoms, and it is easy to understand it in a narrow way: having enough water, enough food, and a balanced diet. But WOA's definition of animal welfare has never been limited to physical health. It defines animal welfare as "the physical and mental state of an animal in relation to the conditions in which he or she lives and dies." Mental state has therefore always been part of the definition. It is simply harder to measure than things such as nutrient levels or feed quality, so it has received less attention in everyday nutrition practice. The freedom itself, however, was never meant to be limited to physical needs. The other four freedoms make this clear from different perspectives. They cover freedom from discomfort, pain and disease, the ability to express normal behaviour, and freedom from fear and distress. The freedom to express normal behaviour is especially relevant to feeding. For a carnivore, normal feeding behaviour may include searching, stalking and tearing, not just eating and swallowing. A feeding system can therefore meet the first freedom in a narrow physical sense while still failing to support normal behaviour and mental wellbeing. Taken together, the Five Freedoms already suggest that feeding has a mental as well as a physical dimension. This chapter makes that point explicit and considers what it means for how feeding decisions should be made.

1.2 A newer tool sharpens the same claim

The Five Domains Model (Mellor et al., 2020), now in its fourth major revision, gives this idea a clearer structure. It looks at four areas: Nutrition, Physical Environment, Health, and Behavioural Interactions. These areas affect the animal's experiences, which can be either negative or positive. These experiences are then brought together in a fifth area, Mental State, which reflects how the animal actually experiences his or her welfare. Nutrition can create negative experiences such as hunger, thirst and nausea, but it can also create positive experiences such as the pleasure of eating and the satisfaction of finding food. This means that a diet can be nutritionally complete but still fail to support good welfare if the animal has little opportunity to experience positive feelings while feeding. This is an important idea for this chapter. Feeling full and feeling satisfied are not necessarily the same thing. Another important development relates to Behavioural Interactions. In 2020, the model changed the name of the fourth domain from "Behaviour" to "Behavioural Interactions". Later work in 2023 placed greater emphasis on agency. Agency means giving an animal opportunities to make choices, have some control over what happens, and take part in activities in his or her own way. Choosing not to take part can also be a form of agency. This has direct relevance to feeding. A feeding programme can give an animal choices about what to eat first, which route to take to find food, or whether to engage with a feeding activity at all. Such opportunities can support welfare in ways that simply providing the right nutrients cannot. Agency is therefore another important part of feeding for welfare, alongside sensory enjoyment and opportunities to feed in ways that reflect natural behaviour.

The Five Domains Model

Nutrition

Physical Environment

Health

Behavioural Interactions


negative or positive experiences

Mental State

1.3 The human analogy, tested rather than assumed

The comparison with human eating is intuitive, and companion animal nutrition research has actually measured some of these factors. Palatability means how much an animal prefers one food over another. In companion animal nutrition, it is an important part of food design and involves much more than simply asking whether food tastes good.

- **Texture and form matter independently of flavour.** Cats, who nibble rather than gulp, are particularly sensitive to the texture and shape of food. Features such as tackiness and stickiness can strongly affect preference, even when the ingredients remain the same.
- **Temperature can change preference.** In a controlled study, older cats were offered identical gravy-coated food at three different temperatures. They preferred the food more as the temperature increased, with the strongest preference close to body temperature. The most likely explanation was that warmth increased the perception of flavour.
- **Palatability does not always transfer across species or food types.** An enhancer that works well in dry food may not work in wet food. Similarly, an enhancer that works for dogs may not work for cats, which have consistently been shown to be more selective about food.

These studies were conducted in companion animals, not wild animals under human care. They therefore cannot be used to claim that the same responses will occur in every wild species. What they do show is that an animal's response to food can depend on factors beyond its nutritional content. This is relevant to wild animals under human care because many of them depend on humans for all or part of their food. A therapeutic or restricted diet may be nutritionally correct but poorly accepted by the animal. If the animal eats less because the food is unpalatable, this can have a direct effect on health. The experience of feeding therefore cannot always be treated as separate from the nutritional outcome. For wild animals under human care, this raises a broader welfare question. Is it enough to provide food that meets nutritional requirements, or should feeding also consider how the animal experiences the food and the process of feeding? The available evidence from companion animals does not provide a complete answer for wild species, but it gives a clear scientific basis for asking the question.

1.4 Species examples: food as enrichment, not just fuel

Carnivores such as felids and canids

For carnivores, the way food is presented can affect behaviour as well as nutrition. Large felids given whole carcasses instead of processed food show more natural behaviour and fewer repetitive behaviours than those given a commercial meat-based diet. In one study, cougars given carcasses suspended on a bungee line showed less pacing and more walking.

One possible reason is that carnivores have a strong motivation to hunt and perform behaviours linked to feeding. When these behaviours are not possible, this motivation may not be satisfied and can contribute to stress and abnormal behaviour. This shows that the way food is presented can be an important part of animal welfare, not simply a way of providing the correct nutrition.

Megaherbivores such as Elephants

Wild elephants may spend up to sixteen hours a day searching for food. Searching for food is therefore an important part of their normal behaviour and is not only about getting enough nutrients. Elephants under human care are not normally restricted in the amount of food they receive and may even tend towards obesity. High-quality food and food-based enrichment can provide more energy than the animal would use while searching for food in the wild. This creates an important challenge. Elephants need adequate nutrition, but they also need opportunities to express natural feeding behaviour without receiving too many calories. Not every enrichment activity is effective. In one study, hiding food above a distinctive structure taught elephants to search in that place, but did not increase their overall searching behaviour. The activity therefore did not meet the study's criteria for effective enrichment. This shows that making food presentation look natural does not automatically make it useful enrichment. Its effect needs to be assessed through the animal's actual behaviour.

Primates

A 2025 study of ring-tailed lemurs in a zoological park found no significant difference in overall positive behavioural diversity between chopped and whole food. The way food was presented and the weather had a greater effect on foraging time than whether the food was whole or chopped.

The authors recommended offering both formats to support a wider range of natural foraging behaviours. This suggests that variety and choice may sometimes be more important than simply providing food in an intact form.

Companion animals

The palatability research discussed earlier looks at flavour, texture, temperature and, where relevant, colour. This is one of the clearest examples of how the experience of food is considered in animal nutrition. In companion animals, owners can easily observe whether an animal accepts or prefers a particular food, which has also created strong demand for research into palatability. These examples show that food can do more than provide nutrients. For animals under human care, feeding can also provide opportunities for natural behaviour, exploration, choice and positive experiences. The challenge is to provide these benefits while still meeting the animal's nutritional needs.

1.5 Where the gap actually sits

Current practice is relatively strong in how food is presented, such as whole food compared with processed food, and hidden food compared with visible food. There is also good attention to how much effort an animal needs to make to get its food. Both are easier to study because they have clear links to natural behaviour. There is much less attention to the sensory side of feeding, including flavour, smell, colour, texture and temperature, especially outside the commercial pet food industry. This points to an important gap in the existing evidence: the part of “mental satisfaction through food” that comes from the sensory experience of eating receives much less deliberate attention in the care of wild animals than it does in companion animals. Yet research on palatability shows that these sensory factors can be measured and can influence how animals respond to food. This does not mean that sensory experience is more important than nutrition or natural feeding behaviour. Rather, it suggests that it is an important part of the feeding experience that deserves greater attention when we consider the welfare of animals under human care.

Part II – Ethics: Feeding Decisions Through a Cost-Benefit Lens

2.1 Why this needs its own framework

Wild carnivores hunt, kill and eat other animals. This is a natural part of being a carnivore. When a carnivore is under human care, this raises an important question. If natural feeding behaviour is an important part of welfare, does this also mean that live prey should be considered? There is not much research on this question, but some important work does exist. A 2025 paper in Zoo Biology by philosopher Bob Fischer is one of the most direct discussions of the issue. The paper is useful because it does not give a simple yes or no answer. Instead, it provides a structured way to consider the different factors involved and weigh the possible benefits and harms. This is exactly where a cost-benefit approach can be useful.

2.2 The benefit side: what live feeding buys

The natural behaviour case is not sentimental. Killing and eating in the wild is a process: stalking, chasing, killing, tearing, selective consumption, and sometimes caching or leaving a remainder. For an

obligate carnivore, it is this whole sequence, not simply the transfer of nutrients at the end, that constitutes “eating” in evolutionary terms. Some individual carnivores under human care will not feed at all unless given the opportunity to catch and kill live prey. Many more show a strong preference for it, which is why live feeding is often considered enrichment rather than simply providing food. Given the documented welfare cost of blocking predatory motivation entirely (Part I, §1.4), this is a real benefit to consider. It should therefore be included in the cost–benefit assessment, not treated as a justification after the decision has already been made.

2.3 The cost side: two costs, not one

Naturalness cuts both ways. Human care cannot fully recreate a hunt in the wild. But human care also removes some of the risks that are part of life in the wild, such as injury from resisting prey, the energy spent hunting, the frequent failure of a hunt, untreated wounds, disease, and unpredictable shortages of prey. None of these are automatically good for welfare simply because they occur in nature. Naturalness cannot be treated as the deciding factor in either direction. It needs to be considered alongside measurable welfare outcomes for the animals actually involved. There is also another cost that is often overlooked: the welfare of the prey animal itself. Feeder animals, including both vertebrates and invertebrates, have historically been treated mainly as sources of nutrition rather than as animals whose welfare also matters. Fischer applies the 3Rs framework of replacement, reduction and refinement, which comes from laboratory animal ethics, to feeder animals specifically. He asks what should be done for these animals, especially because for many feeder species, particularly insects, science has not yet established whether they are capable of suffering.

The question remains open rather than being settled in the negative. This concern is now also reflected in formal policy. The AZA Nutrition Advisory Group has guidelines on the humane and ethical acquisition of vertebrate feeder animals. EAZA also has a standing position statement on the protection of feeder animals, with particular attention to day-old chicks.

2.4 Running the analysis

Three considerations are most important when weighing the benefits against the costs.

- **Nutritional necessity is largely settled.** Obligate carnivores cannot be changed to herbivorous or omnivorous diets. An animal must die to provide meat for another animal. The ethical question is therefore narrower than it first appears. It is not simply whether feeding meat is defensible, but how the feeder animal dies and whether he or she needs to die through the action of the animal being fed.
- **Modern slaughter can greatly reduce the welfare cost.** AZA's Nutrition Advisory Group recommends sourcing carcasses only from USDA or Agriculture Canada inspected facilities. It recommends whole-body prey from licensed vendors and discourages donated animals or animals obtained as roadkill. This helps ensure that feeder animals are humanely handled, stunned and killed according to an established standard, including the AVMA's Guidelines for the Humane Slaughter of Animals, which were expanded in 2024.

Under this approach, much of the enrichment value of natural food presentation can be provided without the additional welfare cost of a live kill. Whole carcasses, different feeding methods and

unpredictable feeding times can provide opportunities for natural feeding behaviour. This is why whole-carcass feeding and pole feeding have become common enrichment strategies at accredited institutions. Live vertebrate feeding is generally reserved for more specific situations, such as an individual animal that refuses dead prey, certain reptile or raptor management programmes, or conservation breeding.

- **Conservation breeding can change the calculation.** For endangered species who are intended for reintroduction, exposure to live prey is not simply enrichment. It can be part of survival training. Red wolves have been taught to hunt live prey before release. Black-footed ferrets, one of North America's most successful carnivore recovery stories, are raised in pre-conditioning pens with live prairie dogs because research shows that ferrets receiving this training have higher survival rates after release. As these protocols were improved, release success increased from under 10% to over 30%.

When considered through a cost–benefit approach, the calculation is different in this situation. The welfare cost to one prey animal in a single encounter is weighed against a much larger benefit, supported by stronger evidence: an increase in the chances of survival and persistence of an endangered species in the wild. Red wolf survival training and routine carcass enrichment for a resident tiger are therefore not the same ethical question, even though they may appear similar on the surface.

2.5 Where the cost–benefit analysis leaves the discussion

Taken together, the honest position is to use a decision process rather than a fixed rule. Live feeding is not automatically right or wrong. It should be evaluated case by case based on three things:

(A)

The documented welfare cost of completely preventing predatory behaviour.

(B)

The welfare of the prey animal and whether another approach with a lower welfare cost can achieve the same behavioural outcome.

(C)

Whether there is a clear purpose, such as a measured survival training benefit for reintroduction, that gives greater weight to the benefit.

Reasonable people who understand animal welfare may weigh these factors differently. That does not mean the framework is weak. Cost–benefit reasoning in ethics is meant to recognise that different situations can lead to different answers. That is the honest place to leave this discussion for the reader, rather than trying to reach an artificial conclusion.

Part III – What Else Belongs in This Discussion

A few points extend the same ideas already discussed here. They do not introduce anything new or unrelated to the main argument:

- **Agency as its own welfare factor (§1.2).** Beyond sensory satisfaction and natural food presentation, current thinking also recognises choice as an important part of welfare. This includes an animal's choice not to engage. Giving animals opportunities to make choices can support positive welfare and adds a third element to the welfare argument, alongside food presentation and sensory design.
- **Positive welfare and the absence of negative welfare.** The Five Freedoms are mainly focused on protecting animals from negative experiences. The Five Domains Model goes further by including positive experiences. This reflects a broader shift from simply asking how to avoid suffering to asking how we can actively create a good life for animals. This is the same approach that this chapter applies specifically to nutrition.
- **Feeder animal welfare as a question of equal consideration.** Part II mainly asks what predators are owed. The same approach should also be applied to prey animals. This is one of the least developed areas of the existing literature and is a central point in Fischer's work. It should therefore be recognised as an area that still needs further study rather than as a settled question.
- **The regulatory foundation.** Referring to the actual guidelines and policies, including the AZA Nutrition Advisory Group statements, the AVMA Humane Slaughter Guidelines and the EAZA position statement on feeder animal welfare, gives the ethics discussion an institutional foundation. It shows that these questions are not only matters of philosophy but are also addressed by professional organisations.
- **A note on the limits of the evidence.** Much of the research on enrichment and palatability is specific to particular species and institutions. Studies of animal behaviour in zoological collections also often involve small sample sizes, and findings do not always apply easily across different species. This limitation should be acknowledged, especially because this chapter takes an open and non-conclusive approach rather than claiming to provide a final answer.

References

- The agency domain and behavioral interactions: Assessing positive animal welfare using the Five Domains Model. (2023). *Frontiers in Veterinary Science*.
- American Veterinary Medical Association. (2024). *AVMA guidelines for the humane slaughter of animals* (2024 ed.).
- AZA Nutrition Advisory Group. (n.d.). *NAG carcass feeding statement and guidelines for the humane and ethical acquisition and management of vertebrate feeder animals (excluding fish)*.
- Calderón et al. (2024). Measuring palatability of pet food products: Sensory components, evaluations, challenges, and opportunities. *Journal of Food Science*.
- European Association of Zoos and Aquaria. (2023). *Position statement on the protection of feed animals, with focus on day-old chicks*.
- Fischer, B. (2025). Feeder insects: The ethics of live feeding in zoos and aquariums. *Zoo Biology*.
- Impacts of chopped food on primate behavior are not clear cut: A case study on zoo-housed ring-tailed lemurs. (2025).
- McPhee, M. E. (2002). Intact carcasses as enrichment for large felids: Effects on on- and off-exhibit behaviors. *Zoo Biology*, 21, 37–47.

- Mellor, D. J. (2017). Operational details of the Five Domains Model and its key applications to the assessment and management of animal welfare. *Animals*, 7(8), 60.
- Mellor, D. J., Beausoleil, N. J., Littlewood, K. E., McLean, A. N., McGreevy, P. D., Jones, B., & Wilkins, C. (2020). The 2020 Five Domains Model: Including human–animal interactions in assessments of animal welfare. *Animals*, 10(10), 1870.
- National Black-footed Ferret Conservation Center. (n.d.). *Black-footed ferret pre-conditioning and release success data*.
- Resende, L. S., Remy, G. L., Ramos, V. A., Jr., & Andriolo, A. (n.d.). The influence of feeding enrichment on the behavior of small felids (Carnivora: Felidae) in captivity. *Zoologia (Curitiba)*.
- World Organisation for Animal Health. (n.d.). *Terrestrial animal health code*, Chapter 7.1: Introduction to the recommendations for animal welfare.

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Neonatal Nutrition and Its Implications for Assisted Rearing of Wild Animals

Neonatal wildlife spans a continuum from altricial states — blind, naked, thermally dependent on a parent — to precocial ones, in which an animal is insulated, mobile, and substantially self-sufficient within hours. That continuum, together with how a lineage transfers passive immunity to its young, predicts nutritional and hand-rearing requirements more reliably than species identity does.

I. The Two Axes That Matter More Than Species

AXIS 1

Developmental mode

Altricial ↔ precocial

AXIS 2

Passive immunity transfer

Placental vs colostral vs yolk

The first axis is developmental mode. An altricial neonate cannot thermoregulate on its own, and because heat loss scales unfavourably with small body size, a naked, low-mass animal chills far faster than intuition suggests. A precocial one enters the world with a working thermoregulatory system and, in several families below, functional independence within a day. The second axis is how passive immunity is transferred. Ungulates such as Cervidae have a synepitheliochorial placenta that blocks essentially all antibody transfer in utero; a fawn's entire immunological inheritance arrives through colostrum, absorbed intact across the neonatal gut in a window that narrows by the hour. Carnivorans have endotheliochorial placentation (the spotted hyena, which is haemochorial, is an exception), permitting some prenatal antibody transfer, which makes colostrum important but not the singular event it is for a fawn. Marsupials (Didelphidae) sidestep the question almost entirely: birth follows a gestation of scarcely two weeks, at a stage closer to a mid-term eutherian foetus, and what would be prenatal development instead continues attached to a teat — immune and organ maturation unfold over weeks of lactation rather than concluding at birth.

II. Energy and Macronutrient Requirements

Caloric need in a growing neonate exceeds resting maintenance by a wide margin, commonly by a factor of two to three, since growth itself carries an energetic cost on top of upkeep. Resting energy requirement is often estimated allometrically from body mass — roughly 70 times body weight in

kilograms raised to the three-quarter power, in kilocalories per day — with a multiple applied on top and scaled to developmental stage and ambient temperature.

$$\text{RER} \approx 70 \times \text{BW}^{0.75} \text{ (kcal/day)} \times 2\text{--}3 \text{ for growth}$$

→ scaled to developmental stage and ambient temperature

BW = body weight in kilograms. Feeding volume ≈ 5% of body weight per feeding in most altricial mammals, rising as gastric capacity increases.

Feeding volume in practice is more useful expressed as a fraction of body weight per feeding, on the order of five per cent for a single feeding in most altricial mammals and rising as gastric capacity increases with age, rather than as an absolute volume, given how widely body mass varies across the families below. Milk composition itself varies by family in ways formula selection needs to track. Lagomorph milk is among the most concentrated of any placental mammal, which is why a dilute replacer under-delivers energy while a mismatched one over-delivers osmotic load and provokes diarrhoea; cervid milk, while less extreme, still carries a fat and protein density that standard bovine milk does not approximate; carnivoran milk sits closer to that of domestic canids, which is part of why canine replacers transfer reasonably well.

III. Gut Closure, Hydration, and the First Day

The neonatal gut absorbs intact macromolecules, including immunoglobulins, by nonspecific pinocytosis for a finite period after birth. Closure is progressive rather than a single moment and is generally far advanced within a day, which is why colostrum delivered late carries markedly reduced value even in an animal that otherwise looks stable. Assessing hydration ahead of any feeding is standard practice, most simply through skin-tent duration and mucous membrane character.

IV. Mammalian Families

Family	Developmental mode / placentation	Formula basis	Interval	Principal risk
Leporidae	Altricial at birth; haemochorial placenta gives partial prenatal antibody transfer	High-fat, high-protein goat-milk base; standard canine/feline replacers are too dilute for this species' concentrated milk	Neonate q3–4h; furred q4–6h	Capture-myopathy mortality generally exceeds nutritional causes

Sciuridae	Altricial; haemochorial placenta	Canine-style milk replacer, diluted to hydration status and concentrated as fur develops	Pink q2–3h; furred q4h	Aspiration from supine feeding; requires a prone position, head level
Didelphidae	Extremely altricial; choriovitelline placenta and ~13-day gestation – birth at a stage roughly equivalent to a mid-gestation eutherian foetus	Marsupial-formulated milk, or a diluted puppy formula sized to the animal	Staged by crown–rump length, not age: tube-fed <10 cm; bottle ~13 cm, q2–4h	Developmental immaturity, not underfeeding, is the dominant risk if treated as an ordinary neonate
Procyonidae	Altricial; endotheliochorial placenta permits partial prenatal antibody transfer	Canine milk replacer, taurine-replete	Neonate q2–4h; older q4–6h	A rabies-vector family in most jurisdictions; screen for distemper before intensive feeding
Cervidae	Precocial “hider” strategy; synepitheliochorial placenta transfers no antibody	Goat's milk or a fawn-specific replacer; cow's milk is a poor match for fat and protein content	Neonate q3–4h, conservative volumes	Rumen immaturity – wrong formula or volume causes bloat and enterotoxaemia

V. Weaning and the Transition to Solid Diet

Transition to solid diet tracks digestive maturation rather than a fixed age. In Cervidae, the shift is gated by microbial colonisation of the rumen, without which fermentative digestion of plant fibre cannot proceed; introducing browse before colonisation is underway yields little direct nutrition but helps seed the process. Leporidae, by contrast, rely from a young age on caecotrophy – reingestion of specialised soft faeces – and the gut flora enabling it typically establishes over the first several weeks. Among birds, precocial hatchlings such as Anatidae develop a functional gizzard early and self-feed almost immediately, while altricial families continue to depend on a crop-based feeding relationship until fledging.

VI. Avian Families

Birds transfer passive immunity maternally into the yolk as IgY, an immunoglobulin functionally analogous to mammalian IgG, absorbed by the embryo before hatching – there is no avian equivalent of a colostral window. The more consequential split is between altricial hatchlings, blind and naked and wholly dependent on parental feeding, and precocial ones that leave the nest within a day of hatching.

Family (representative)	Developmental mode	Diet basis	Handling consideration
Passerine families (e.g. Turdidae)	Altricial; poikilothermic at hatch	Insectivore/omnivore hand-rearing formula, offered roughly every 15–20 minutes through daylight hours; never bread or milk	Moderate habituation risk
Accipitridae & Strigidae	Altricial, with an extended nestling period	Whole prey items scaled to age; muscle meat alone induces calcium deficiency	Filial imprinting within a sensitive early window can be permanent and release-disqualifying; puppet-feeding, out of sight and silent, is standard practice
Anatidae	Precocial (nidifugous); self-feeding within hours given heat and shallow water	Waterfowl-specific starter crumble — standard chick starter's lower niacin content predisposes to angel-wing deformity	Imprints within hours of hatching; grouping with conspecifics early is the principal preventive measure
Columbidae	Altricial; fed a sloughed, lipid-rich crop secretion ("crop milk") rather than regurgitated prey	Commercial squab hand-rearing formula, delivered by crop tube or syringe	Comparatively low imprinting risk

VII. Growth Monitoring and Referral Thresholds

Daily weighing is the most sensitive proxy available for an emerging problem, more so than appetite or activity level, either of which can lag a developing deficit by a day or more. Altricial mammals in the families above typically gain at a rate expressed in several percent of body weight per day once initial dehydration and thermal deficits are corrected, while a fawn or precocial hatchling, further along in development, gains more modestly in relative terms while investing more in mobility and thermoregulation.

Referral thresholds

- Persistent hypothermia despite active warming;
- open wounds, myiasis, or neurologic signs such as head tilt or circling;
- a plateau or loss of weight over 48 to 72 hours despite correct formula and schedule.

Each identifies a clinical problem outside the scope of hand-rearing technique.

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CHAPTER

10

Mammals

Class Mammalia

Rodents

Order Rodentia

Rabbits

Order Lagomorpha

Marsupials

Order Diprotodontia

Carnivores

Order Carnivora

Even-toed Ungulates

Order Artiodactyla

Odd-toed Ungulates

Order Perissodactyla

Elephants

Order Proboscidea

Rodents

Order Rodentia

PORCUPINES

TENTATIVE DIET PLAN

Indian Crested Porcupine

(Hystrix indica)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Evening (nocturnal)	Sweet potato (with skin)	3 pcs
	Beetroot (with skin)	2 pcs
	Carrot (in total)	1 pcs
	Pumpkin (bigger piece)	1 pcs
	Radish (in total with green)	1 pcs
	Sweetcorn (cob with leaves)	1 pcs
	Salad (unchopped leaves)	10 pcs
	Chicory (in total)	1 pcs
	Coriander (unchopped)	1 bundle
	Amaranth (unchopped)	1 bundle
	Alfalfa (fresh)	500 g
	Dal (soaked)	50 g
	Pellets	80 g
Once per week	1 Coconut (can stay in the enclosure)	

TENTATIVE DIET PLAN

Malayan Porcupine

(Hystrix brachyura)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Evening (nocturnal)	Sweet potato (with skin)	3 pcs
	Beetroot (with skin)	2 pcs
	Carrot (in total)	1 pcs
	Pumpkin (bigger piece)	1 pcs
	Radish (in total with green)	1 pcs
	Sweetcorn (cob with leaves)	1 pcs
	Salad (unchopped leaves)	10 pcs
	Chicory (in total)	1 pcs
	Coriander (unchopped)	1 bundle
	Amaranth (unchopped)	1 bundle
	Alfalfa (fresh)	500 g
	Dal (soaked)	50 g
	Pellets	80 g
Once per week	1 Coconut (can stay in the enclosure)	

TENTATIVE DIET PLAN

Crested Porcupine

(Hystrix cristata)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Evening (nocturnal)	Sweet potato (with skin)	3 pcs
	Beetroot (with skin)	2 pcs
	Carrot (in total)	1 pcs
	Pumpkin (bigger piece)	1 pcs
	Radish (in total with green)	1 pcs
	Sweetcorn (cob with leaves)	1 pcs
	Salad (unchopped leaves)	10 pcs
	Chicory (in total)	1 pcs
	Coriander (unchopped)	1 bundle
	Amaranth (unchopped)	1 bundle
	Alfalfa (fresh)	500 g
	Dal (soaked)	50 g
	Pellets	80 g
Once per week	1 Coconut (can stay in the enclosure)	

TENTATIVE DIET PLAN

African Brush-tailed Porcupine

(*Atherurus africanus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Evening (nocturnal)	Sweet potato (with skin)	3 pcs
	Beetroot (with skin)	2 pcs
	Carrot (in total)	1 pcs
	Pumpkin (bigger piece)	1 pcs
	Radish (in total with green)	1 pcs
	Sweetcorn (cob with leaves)	1 pcs
	Salad (unchopped leaves)	10 pcs
	Chicory (in total)	1 pcs
	Coriander (unchopped)	1 bundle
	Amaranth (unchopped)	1 bundle
	Alfalfa (fresh)	500 g
	Dal (soaked)	50 g
	Pellets	80 g
Once per week	1 Coconut (can stay in the enclosure)	

CAPYBARAS, CAVIES & MARAS

TENTATIVE DIET PLAN

Lesser Capybara

(Hydrochoerus isthmius)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
7:00 – 7:00 (next day)	Hay (please leave in the rack all day and do not remove until the next day)	700 g
	Concentrate (rabbit chew)	250 g
8:00 – 13:00	Herbal mix (leaves not cut) (20% Romaine lettuce, 20% dandelion, 12% moringa leaves, 12% Iceberg lettuce, 10% hibiscus flowers, 10% hibiscus leaves, 10% Amaranth leaves, 2% mulberry leaves, 2% Coriander leaves, 2% Fenugreek leaves)	700 g
13:00 – 18:00	Alfalfa (fresh)	300 g
	Bermuda grass (fresh)	300 g
	Root/vegetable mix (coarse chopped): 20% Carrot, 20% beetroot, 20% Sweet potato, 20% Pumpkin, 20% cucumber	300 g
	Capsicum*, red, yellow (whole)	2 pcs

Diet in the wild

Capybaras are herbivores. They eat a mix of aquatic vegetation, grasses, barks, tubers, sugar cane and plant roots. During the dry season or in drought conditions, capybaras will also eat grains, melons, reeds and squashes.

Special characteristic

Capybaras are unable to synthesise vitamin C and need a dietary source. They also eat their own faeces (=coprophagy), which contain beneficial bacteria that help to break down the fibre from the grass.

TENTATIVE DIET PLAN

Rock Cavy

(*Kerodon rupestris*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Concentrate (rabbit)	50 g
	Hay (meadow, dongri or timothy)	50 g
	Sweetcorn (5 cm slice)	1 pcs
8:00 – 13:00	Tender leaves	500 g
	Vegetables (coarsely chopped) 25% Cucumber, 25% Carrots, 25% Pumpkin, 25% Beetroot	100 g
15:00 – 18:00	Tender leaves	500 g
	Fruit/vegetable mix (coarsely chopped) 25% Apple, 25% jicama, 25% papaya, 25% spinach	100 g

Diet in the wild

Rock cavies are generalist folivores. In their unpredictable Caatinga environment, drought often leaves trees leafless. During dry periods, vegetation continues to grow in the rock piles where rock cavies live, allowing colonies to live through periods of low productivity. During periods of high productivity, rock cavies feed on leaves, buds, flowers, and bark, most often foraging from the ground or on tree branches.

Special characteristic

In captivity, rock cavies eat a variety of fruits and vegetables.

TENTATIVE DIET PLAN

Patagonian Mara

(Dolichotis patagonum)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (rabbit chew)	80 g
	Hay (meadow hay or timothy hay)	100 g
	Sweetcorn (with leaves, cut the cob 1 by 4)	1 pcs
	Jicama	1 pcs
8:00 – 13:00	Alfalfa (fresh)	150 g
	Bermuda grass (fresh)	150 g
13:00 – 18:00	Alfalfa (fresh)	150 g
	Bermuda grass (fresh)	150 g

Diet in the wild

Patagonian maras are herbivores (graminivores, frugivores). The diet of these rodents consists entirely of plants, mostly Pappophorum grass.

Special characteristic

They supplement their diet with a wide variety of cacti, fruits, and herbs.

TENTATIVE DIET PLAN

Chacoan Mara

(*Pediolagus salinicola*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (rabbit chew)	30 g
	Hay (meadow hay or timothy hay)	100 g
	Sweetcorn (with leaves, cut the cob 1 by 4)	1 pcs
	Jicama (cut 1 by 2)	1 pcs
8:00 – 13:00	Alfalfa (fresh)	100 g
	Bermuda grass (fresh)	100 g
13:00 – 18:00	Alfalfa (fresh)	100 g
	Bermuda grass (fresh)	100 g

Diet in the wild

Chacoan maras are herbivores that feed on a variety of plant matter. Their diet consists mainly of grasses and herbs, but they also consume plants, fruits, seeds, and succulents.

Special characteristic

They are a close relative of the better-known Patagonian mara.

TENTATIVE DIET PLAN

Domesticated Guinea Pig

(*Cavia porcellus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
7:00 – 7:00 next day	Hay (dongri or timothy hay)	30 g
9:00 – 17:00	Concentrate (rabbit chew)	10 g
	Carrot (unchopped)	½ pcs
	Grass (fresh, Bermuda grass)	20 g

Diet in the wild

Guinea pigs are herbivorous animals. Their diet consists mainly of green fodder. They also eat seeds and roots to a lesser extent.

Special characteristic

Guinea pigs' teeth grow throughout their lives. The newborn young animals are precocial and begin feeding by themselves within a few days.

AGOUTIS

TENTATIVE DIET PLAN

Mexican Agouti

(*Dasyprocta mexicana*)

Black-rumped Agouti

(*Dasyprocta prymnolopha*)

Red-rumped Agouti

(*Dasyprocta leporina*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Concentrate (rabbit)	80 g
	Hay (meadow, dongri or timothy)	200 g
	Sweetcorn (5 cm slice)	1 pcs
8:00 – 13:00	Tender leaves	1000 g
	Vegetables* 25% Cucumber, 25% Carrots, 25% Pumpkin, 25% Beetroot	200 g
8:00 – 13:00	Tender leaves	1000 g
	Fruit/vegetable mix 25% Apple, 25% jicama, 25% papaya, 25% spinach	200 g

Diet in the wild

These rodents are herbivores, which means that they eat plants. Most of their diet consists of nuts, berries, and fruits. They also feed on vegetables, crops, succulents, roots, seeds, and more.

Special characteristic

While foraging, they move from tree to tree searching for fallen fruit.

PACAS

TENTATIVE DIET PLAN

Lowland Paca

(*Cuniculus paca*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
17:00 until the next day 17:00	Hay Timothy hay	1 kg
17:00 until next morning	Alfalfa (fresh)	500 g
17:00 until next morning	Browse (examples): Bamboo leaves (<i>Bambusa vulgaris</i>), Cordia leaves (<i>Bocote</i>), Tamarind leaves, Moringa leaves (<i>Moringa oleifera</i>)	offer 2 varieties of this list, each at least 100 g, (200 g in total)
	Fruit mix (20% papaya, 20% banana, 20% apple, 10% Muskmelon, 10% pomegranate, 10% sapodilla, 10% watermelon)	100 g
	Vegetables Avocado	1 pcs
	Pellets (rabbit chew)	50 g

Diet in the wild

The diet of the Lowland Paca mainly consists of plant matter, making them herbivorous creatures. They are known to consume a variety of fruits, nuts, seeds, leaves, and roots, depending on the availability of food in their environment.

Special characteristic

Pacas are mostly nocturnal.

CHINCHILLAS

TENTATIVE DIET PLAN

Long-tailed Chinchilla

(*Chinchilla lanigera*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Hay Meadow hay/Alfalfa hay (50 : 50)*	50 g
	Concentrate Complete diet for rabbits	30 g
8:00 – 8:00 (next morning)	Cashew nuts	3 g
	Herbal mix (fresh) (not chopped: Coriander, Amaranth, fenugreek etc)	30 g
	Hay Meadow hay/Alfalfa hay (50 : 50)*	100 g

*mix out of meadow hay and alfalfa hay (half and half)

Diet in the wild

Long-tailed chinchillas are herbivores (folivores). Their diet includes different types of vegetation, but mostly grass and seeds.

Special characteristic

They eat their own caecal faeces (caecotrophy) and need a sand bath for their fur.

HAMSTERS

TENTATIVE DIET PLAN

Common Hamster

(*Cricetus cricetus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
17:00 till 17:00 next day	Concentrate (Pellets for small rodents)	10 g

Diet in the wild

Hamsters are granivores. In the wild they eat mainly seeds, but also insects (especially during breeding time).

Special characteristic

Hamsters are nocturnal. They store their food in their nestboxes (regular cleaning required)

LAOTIAN ROCK RAT

TENTATIVE DIET PLAN

Laotian Rock Rat

(*Laonastes aenigmamus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
7:00 – 7:00 (next day)	Browse (with tender leaves and buds; 25% Sweet potato vine, 25% ficus, 25% banyan, 25% eucalyptus)	100 g
	Pellets (leafeater Pellets)	20 g
	Seed and nuts mixture (small rodents*)	20 g
	Mealworm	5 pcs
9:00 – 17:00	Vegetables/fruits (20% Carrots, 20% apples, 20% jicamas, 20% Pumpkin, 20% mushrooms)	30 g
	Sweetcorn (5 cm slice)	5 pcs

Diet in the wild

Their diet consists mainly of green fodder along with insects. They also eat seeds and roots to a lesser extent.

Special characteristic

As the name suggests, they are quite adapted to move around on rocky terrain.

Rabbits

Order Lagomorpha

TENTATIVE DIET PLAN

Rabbit

(*Oryctolagus cuniculus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Hay (dongri or timothy hay)	50 g
	Concentrate (rabbit chew)	20 g
9:00 – 17:00	Carrot (unchopped)	1 pcs
	Grass (fresh Bermuda grass)	30 g

Diet in the wild

Rabbits are herbivorous animals. Their diet consists mainly of green fodder. They also eat seeds and roots to a lesser extent.

Special characteristic

Rabbits' teeth grow throughout their lives. They eat their own caecal faeces (caecotrophy), which are excreted in the early hours of the morning.

Marsupials

Order Diprotodontia

GLIDERS

TENTATIVE DIET PLAN

Sugar Glider

(*Petaurus breviceps*)

TIME	FOOD ITEM	QUANTITY (PER ANIMAL)
17:00	Fruit mix: (Banana, pomegranate, apples, Muskmelon, papaya, sapodilla, ladyfingers, French beans, dry dates)	20 g
	Flowers: Hibiscus	1 pcs
	Insects: Mealworms, super worms, locusts	2 g
	<i>Supplements</i>	
	Paneer (Tuesday, Friday)	5 g
	Chicken meat (boiled) (Monday, Thursday, Sunday)	5 g
	Pellets (dry cat food)	2 g
	Formula: Soup (Per 100 ml) — Brown Rice: (Weight 15 g raw, cooked and Boiled); Lori Soup: (40 ml Versele-Laga Nectar); Whole Ground Apple – 1 pcs; Honey – 10 ml (Blend everything to thick soup)	20 ml

Carnivores

Order Carnivora

CATS

TENTATIVE DIET PLAN

Asiatic Lion

(*Panthera leo leo*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the bone with skin	Fresh, raw	7 kg
	Panthera Supplement		70 grams
Day 2	Fasting day		
Day 3	Buffalo meat on the bone with skin	Fresh, raw	6 kg
	Panthera Supplement		60 grams
Day 4	Fasting day		
Day 5	Buffalo meat on the bone with skin	Fresh, raw	7 kg
	Panthera Supplement		70 grams
Day 6	Fasting day		
Day 7	Fasting day		

Diet in the wild

Carnivorous, mainly hunting a large ungulate species and other mammals.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (three times per week).

TENTATIVE DIET PLAN

Lion

(*Panthera leo*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the bone with skin	Fresh, raw	8 kg
	Panthera Supplement		80 grams
Day 2	Fasting day		
Day 3	Buffalo meat on the bone with skin	Fresh, raw	6 kg
	Panthera Supplement		60 grams
Day 4	Fasting day		
Day 5	Buffalo meat on the bone with skin	Fresh, raw	8 kg
	Panthera Supplement		80 grams
Day 6	Fasting day		
Day 7	Fasting day		

Diet in the wild

Carnivorous, mainly hunting a large ungulate species and other mammals.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (three times per week).

TENTATIVE DIET PLAN

Tiger

(*Panthera tigris*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the bone with skin	Fresh, raw	8 kg
	Panthera Supplement		80 grams
Day 2	Fasting day		
Day 3	Buffalo meat on the bone with skin	Fresh, raw	6 kg
	Panthera Supplement		60 grams
Day 4	Fasting day		
Day 5	Buffalo meat on the bone with skin	Fresh, raw	8 kg
	Panthera Supplement		80 grams
Day 6	Fasting day		
Day 7	Fasting day		

Diet in the wild

Carnivorous, mainly hunting a large ungulate species and other mammals.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (three times per week).

TENTATIVE DIET PLAN

Leopard

(*Panthera pardus*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the bone with skin	Fresh, raw	4 kg
	Panthera Supplement		40 grams
Day 2	Fasting day		
Day 3	Buffalo meat on the bone with skin	Fresh, raw	4 kg
	Panthera Supplement		40 grams
	Or		
	Guinea Fowl		2
Day 4	Fasting day		
Day 5	Buffalo meat on the bone with skin	Fresh, raw	4 kg
	Panthera Supplement		40 grams
Day 6	Fasting day		
Day 7	Fasting day		

Diet in the wild

Obligate carnivore, hunting a wide range of mammals, birds and reptiles.

Notes

Diet is for a single adult animal. Diet should be adjusted for sex, size, level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (three times per week).

TENTATIVE DIET PLAN

Amur Leopard

(*Panthera pardus orientalis*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the bone with skin	Fresh, raw	4 kg
	Panthera Supplement		40 grams
Day 2	Fasting day		
Day 3	Buffalo meat on the bone with skin	Fresh, raw	4 kg
	Panthera Supplement		40 grams
Day 4	Fasting day		
Day 5	Rabbit	Whole, freshly killed with gut removed	3
Day 6	Buffalo organs (liver, kidneys and heart)	Fresh, raw	2 kg
	CalciCare Supplement		20 grams
Day 7	Fasting day		

Diet in the wild

Carnivorous predator feeding mainly on medium-sized ungulates (roe deer and sika deer) supplemented with hares, badgers, small mammals and birds.

Notes

Diet should be adjusted for sex, size, level of activity and reproductive status. Feeding should take place in the late afternoon or evening (4 times per week).

TENTATIVE DIET PLAN

Rusty-spotted Cat

(*Prionailurus rubiginosus*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1, 3, 5	Mice	Whole, fresh killed	2
	Buffalo	Minced meat	40 grams
	Premium Cheetah Supplement		1 pinch
	Quail	Whole freshly killed	1
Day 2, 4, 6	Day-old chicks	Whole with yolk sac removed	5
	Guinea pig	Whole, freshly killed	1 small guinea pig or half large one
Day 7	Royal Canin kitten Food	Dry Pellets	40 grams

Diet in the wild

Carnivorous, feeding mainly on rodents and small birds, but also reptiles, amphibians and some insects.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place in the early morning and late afternoon/evening.

TENTATIVE DIET PLAN

African Wildcat

(*Felis lybica*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Evening feed	Rat or Quail	Whole, freshly killed	1
Morning feed	Royal Canin kitten Food	Dry	100 grams

Diet in the wild

Carnivorous, preying on rats, mice, gerbils, hares, small to medium-sized birds and lizards. They hunt mostly at night.

Notes

Feed every day according to the table above. No fasting days.

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

DOGS, WOLVES & FOXES

TENTATIVE DIET PLAN

African Wild Dog

(Lycaon pictus)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Dressed Chicken	Dressed, fresh	1.2 kg
	Panthera Supplement		12 grams
Day 2	Buffalo meat on the Bone with skin	Fresh, raw	1.5 kg
	Panthera Supplement		15 grams
Day 3	Rabbit	Whole, freshly killed with gut removed	1.5 kg
Day 4	Dressed Chicken	Dressed, fresh	1.2 kg
	Panthera Supplement		12 grams
Day 5	Buffalo meat on the Bone with skin	Fresh raw	1.5 kg
	Panthera Supplement		15 grams
Day 6	Dressed Chicken	Half, fresh	800 grams
	Buffalo liver	Raw, fresh	400 grams
	Panthera Supplement		12 grams
Day 7	Fasting day		

Diet in the wild

Carnivorous, hunting medium to large ungulates, but smaller prey such as rodents and birds are also consumed. Wild dogs hunt almost every day and are most active at dusk and dawn.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (once daily).

TENTATIVE DIET PLAN

Arabian Wolf

(*Canis lupus arabs*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Dressed Chicken	Dressed with skin and bones, fresh	1.2 kg
	Panthera Supplement		10 grams
Day 2	Buffalo meat on the bone with skin	Fresh, raw	1.3 kg
	Panthera Supplement		15 grams
Day 3	Dressed Chicken	Dressed with skin and bones, fresh	1.2 kg
	Panthera Supplement		10 grams
Day 4	Buffalo meat on the bone with skin	Fresh raw	1.3 kg
	Panthera Supplement		15 grams
Day 5	Dressed Chicken	Dressed with skin and bones, fresh	1.2 kg
	Panthera Supplement		10 grams
Day 6	Rabbit	Whole, with skin, but gut removed	1.5 kg
Day 7	Fasting day		

Diet in the wild

Mainly carnivorous, but also omnivorous and in some areas largely dependent on human food waste. Consumes a wide range of small to medium-sized mammals, birds and reptiles.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (once daily).

TENTATIVE DIET PLAN

Arctic Fox

(*Vulpes lagopus*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Royal Canin cat Pellets	Dry Pellets	20 grams
Evening feed	Egg	Boiled/crushed with shell	1
	Raw Chicken piece	Raw, fresh, with bone	80 grams
	Panthera powder	Added to Chicken	1 pinch

Diet in the wild

Generally, eat any small animal they can find, including lemmings, voles, hares and other rodents as well as birds' eggs, fish and carrion.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Silver Fox

(*Vulpes vulpes*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms and beetles)	Whole	30 g
	Royal Canin kitten Food	Dry Pellets	75 g
	Apple	Sliced	20 g
Evening feed	Egg	Boiled with shell	1
	Dressed Chicken Pieces with bone	Raw, fresh	150 g

Diet in the wild

Omnivorous and opportunistic feeders, feeding primarily on insects, small mammals, reptiles, small birds, and fruits.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

BEARS

TENTATIVE DIET PLAN

American Black Bear

(*Ursus americanus*)

INDICATIVE TIME	ITEM	FEMALE	MALE
7:00 – 12:00	Vegetables (unchopped: 20% Carrots, 20% cucumber, 20% tomato, 20% green peas, 20% broccoli)	2.5 kg	4.0 kg
	Fruits (unchopped: 20% apples, 20% oranges, 20% sapodilla, 20% banana, 20% guava)	1.0 kg	2.0 kg
	Jicama	1 pcs	2 pcs
	Eggs (boiled, egg white and egg yolk, with shell)	4 pcs	7 pcs
	Bread with Honey	5 slices	15 slices
12:00 – 15:00	Day 1 Pumpkin (small, in total)	1 pcs	
	Day 2 Fish (in total, e.g. salmon*)	0.5 kg	
	Day 3 Watermelon (small, total)	1 pcs	
	Day 4 Fresh dates** (hide in the outdoor area)	0.5 kg	
	Day 5 Muesli mix (25% raisins, 25% cashew, 25% Pumpkin Seeds, 25% dried figs) – hide in the outdoor area	0.5 kg	
	Day 6 Sugarcane	1 pcs	
	Day 7 Coconut (total)	1 pcs	
15:00 – 18:00	Dalia	2.0 kg	3.5 kg
	Vegetables (unchopped: 20% Sweet potatoes, 20% bottle gourd, 20% tomato, 20% beans, 20% bell pepper)	1.5 kg	4.0 kg
	Fruits (unchopped: 40% apples, 20% pears, 40% oranges)	2.0 kg	3.0 kg
	Chicken (dressed, boneless)	0.25 kg	0.5 kg

Notes

Offer 2 times a week larger piece on tree trunk with bark

TENTATIVE DIET PLAN

Asiatic Black Bear

(Ursus thibetanus)

TIME	ITEM	30 – 69 KG BW	70 – 99 KG BW
Morning	Vegetable porridge (20% Carrots, 20% Beetroot, 20% cucumber, 20% tomato, 20% Pumpkin)	0.4 kg	0.75 kg
	Fruit porridge (20% apple, 20% banana, 20% watermelon, 20% Muskmelon, 20% papaya)	0.4 kg	0.75 kg
	Khichri + Agrimin forte	500 g + 30 g	1.0 kg + 60 g
	Eggs (boiled, egg white + egg yolk, without shell, ground)	2 pcs	3 pcs
	Honey	20 g	20 g
Afternoon	Chicken (boiled)	0.10 kg	0.20 kg
	Vegetable porridge (20% Carrots, 20% Beetroot, 20% cucumber, 20% tomato, 20% Pumpkin)	0.40 kg	0.85 kg
	Fruit porridge (20% apple, 20% banana, 20% watermelon, 20% Muskmelon, 20% papaya)	0.40 kg	0.75 kg
	Eggs (boiled, egg white + egg yolk, without shell, ground)	1 pcs	3 pcs
	Alfalfa, fresh (ground)	0.20 kg	0.40 kg
Enrichment	Monday: fruit juice – frozen (small paper cup)		
	Tuesday: Yoghurt – frozen (250 g)		
	Wednesday: minced fish (tilapia/rohu/catla): 0.2 kg		
	Thursday: watermelon half and frozen		
	Friday: ice cube with cucumber pieces		
	Saturday: Chicken neck (200 g)		
	Sunday: cashew nuts (spread in outside area): 100 g		

TENTATIVE DIET PLAN

Sloth Bear

(Melursus ursinus)

TIME	ITEM	60 – 99 KG BW	100 – 150 KG BW
Morning	Vegetables (20% Carrots, 10% Beetroot, 20% cucumber, 10% tomato, 20% Pumpkin, 10% green peas, 10% boiled regular potato)	0.75 kg	1.0 kg
	Leafy Vegetables (20% Pak Choi, 20% American Kale, 20% Spinach, 20% Lollo Rosso, 20% Endive Lettuce)	0.75 kg	1.0 kg
	Khichri + Agrimin forte	1.0 kg + 20 g	1.0 kg + 20 g
	Eggs (boiled, egg white and egg yolk, with shell)	2 pcs	3 pcs
	Leaves* (see below)	4.0 kg	4.0 kg
	Honey	20 g	20 g
	Jicama	1 pcs	1 pcs
Afternoon	Rice (boiled)	0.2 kg	0.3 kg
	Chicken (boiled)	0.2 kg	0.3 kg
	Leafy Vegetables (20% Pak Choi, 20% American Kale, 20% Spinach, 20% Lollo Rosso, 20% Endive Lettuce)	0.75 kg	1.0 kg
	Fruits (in total or halved: 20% jujube, 20% chiku, 10% oranges, 10% guava, 20% Indian apples, 20% banana)	0.75 kg	1.0 kg
	Insects (Mix of cockroach, Superworm, mealworm)	0.2 kg	0.3 kg
	Leaves (see below)	1.5 kg	1.5 kg

Leaves (examples)

Bamboo leaves (*Bambusa vulgaris*), cordia leaves (*Bocote cordia*), Brazilian spinach (*Alternanthera sissoo*), tamarind leaves (*Tamarindus indica*), moringa leaves (*Moringa oleifera*), kachnar leaves (*Bauhinia purpurea*), guava leaves (*Psidium guajava*), sweet corn leaves (*Zea mays*), mango leaves (*Mangifera indica*), gulmohar leaves (*Delonix regia*), hibiscus leaves (*Hibiscus* spp.), curry leaves (*Murraya koenigii*), almond leaves (*Prunus dulcis*) etc.

Supplement

- Sharkorferrol 5 ml/animal/day
- A to Z vitamin 5 ml/animal/day
- Multivitamin 2 tablets/animal/day

Enrichment

- Monday: Pieces of sugarcane – approx. 20 cm long
- Tuesday: Yoghurt - frozen (250 g)
- Wednesday: fish (catfish/tilapia/rohu/catla): 0.25 kg
- Thursday: watermelon in total and frozen
- Friday: ice popsicle with cucumber pieces
- Saturday: chicken neck (200 g)
- Sunday: cashew nuts (spread in outside area): 100 g

TENTATIVE DIET PLAN

Sun Bear

(Helarctos malayanus)

TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
7:00 – 12:00	Vegetables (raw, coarse chopped: Carrots, cucumber, regular tomato, Sweet potato, Beetroot, Pumpkin)	1500 g
	Fruits (coarsely chopped: apples – cut 1 by 2, watermelon with skin - cut 1 by 6, orange – cut 1 by 2, Muskmelon with skin – cut 1 by 4)	1200 g
	Leafy Vegetables (whole leaves): Coriander, fenugreek, Amaranth, bok choy	1000 g
Afternoon	Day 1 Dalia with Honey (wild honey without additional sugar)	500 g
	Day 2 Cockroaches with Honey (wild honey without additional sugar)	200 g
	Day 3 Khichri	500 g
	Day 4 Fresh dates* (hide in the outdoor area)	500 g
	Day 5 Muesli mix (25% raisins, 25% cashew, 25% Pumpkin seeds, 25% cranberries) – hide in outdoor habitat	250 g
	Day 6 Insect mix (mealworms, superworms, crickets) with Honey (wild honey without additional sugar)	250 g
	Day 7 Dalia with Honey (wild honey without additional sugar)	500 g
15:00 – 18:00	Vegetables (raw, coarsely chopped: Carrots, cucumber, regular tomato, Sweet potato, Beetroot, Pumpkin)	1500 g
	Seasonal fruits (according to availability; in total = not chopped; choose out of the following items: Chiku, custard apple, mulberry, jackfruit, jamun, mango, ziziphus, amla, figs, etc.)	1000 g
	Nuts (mix)	100 g
	Coconut (meat)	200 g

Diet in the wild

The sun bear's diet is characterised by its emphasis on insects, honey, and tropical fruits, as well as its ability to prey on small vertebrates.

Special characteristic

They have a strong sense of smell, which helps them locate food in the dense forests where they live. Sun bears are excellent climbers and spend a lot of time foraging for food in the treetops. They have long, sharp claws that help them dig for insects in rotting logs and termite mounds.

OTTERS, BADGERS, POLECATS & SKUNKS

TENTATIVE DIET PLAN

Asian Small-clawed Otter

(*Aonyx cinereus*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Catfish, tilapia or Goldfish	Live - 7 to 10 cm in length	1 fish
Midday feed	Freshwater fish	Raw, fresh, chopped 2cm x 2cm	50 grams
	Prawns with shell	Raw, whole, fresh	30 grams
Evening feed	Fresh water fish	Raw, fresh, chopped 2cm x 2cm	50 grams
Twice a week	Crab	Raw, whole, fresh	1 crab

Diet in the wild

Feeds mostly on molluscs, crabs, mudskippers, catfish and Trichogaster fish. Also will eat snakes, frogs, insects and rats.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Asian Badger

(*Meles leucurus*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms, super worms and beetles)	Whole	50 grams
	Dog food	Dry Pellets	100 grams
	Apple/Pear	Sliced	30 grams
	Carrots	Sliced	30 grams
Evening feed	Egg	Boiled with shell	1
	Dressed Chicken	Pieces with bone	200 grams
	Panthera Supplement		1 pinch

Diet in the wild

Highly adaptable and opportunistic omnivores, whose diet encompasses a wide range of animals and plants.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Greater Hog Badger

(*Arctonyx collaris*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Dog food	Dry Pellets	100 grams
	Apple/Pear	Sliced	30 grams
	Carrots	Raw, sliced	30 grams
Evening feed	Egg	Boiled with shell	1
	Dressed Chicken	Pieces with bone	200 grams
	Panthera Supplement		1 pinch

Diet in the wild

Omnivores, whose diet encompasses a wide range of animals, roots and fruits.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Polecat

(*Mustela putorius*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Quail	Halved, including feathers	60 grams
Day 2	Freshwater fish, Crabs or crayfish	Whole, including scales and bones	60 grams
	Panthera Supplement		1 pinch
Day 3	Mice or rats	Whole, freshly killed	60 grams
Day 4	Royal Canin kitten Food	Pellets	40 grams
Day 5	Day-old chicks	Whole, remove yolk sac.	3
	Or		
	Chicken Heads/necks	Raw, fresh	60 grams
Day 6	Rabbit	Whole, quartered, freshly killed, gut removed	0.25
Day 7	Royal Canin kitten Food	Pellets	40 grams

Diet in the wild

Feeds mostly on rodents, amphibians, reptiles and birds.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place in the late afternoon as they are mainly nocturnal/crepuscular (once daily).

TENTATIVE DIET PLAN

Marbled Polecat

(*Vormela peregusna*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Quail	Halved, including feathers	60 grams
Day 2	Chicken pieces	Whole, fresh with gut removed	60 grams
	Panthera Supplement		1 pinch
Day 3	Mice or rats	Whole, freshly killed	60 grams
Day 4	Royal Canin kitten Food	Pellets	40 grams
Day 5	Day old chicks	Whole, remove yolk sac.	3
	<i>Or</i>		
	Chicken Heads/necks	Raw, fresh	60 grams
Day 6	Rabbit	Whole, quartered, freshly killed, gut removed	0.25
Day 7	Royal Canin kitten Food	Pellets	40 grams

Diet in the wild

Feeds mostly on rodents, amphibians, reptiles and birds.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place in the late afternoon as they are mainly nocturnal/crepuscular (once daily).

TENTATIVE DIET PLAN

Striped Skunk

(*Mephitis mephitis*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms, super worms and beetles)	Whole	30 grams
	Apple/Pear	Sliced	10 grams
Evening feed	Egg	Boiled with shell	1
	Cat food	Dry Pellets	15 grams

Diet in the wild

Primarily insectivorous, but adaptable to eating small vertebrates, eggs and fruit.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

CIVETS, GENETS & BINTURONGS

TENTATIVE DIET PLAN

African Civet

(*Civettictis civetta*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Evening feed	Locusts	Whole	5
	Eggs	Whole raw	2
	Rat or Quail	Whole, freshly killed	1
	Apple	chopped	100 grams
	Cucumber	chopped	50 grams
Morning feed	Dog Pellets	Dry	100 grams
	Carrots	Raw, chopped	50 grams

Diet in the wild

Omnivorous, eating a variety of fruits, insects, small mammals, birds, reptiles, carrion and eggs. They are typically nocturnal, foraging for food for several hours during the night.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Common Genet

(Genetta genetta)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms and beetles)	Whole	50 grams
	Royal Canin kitten Food	Dry Pellets	60 grams
	Apple, pear or figs	Sliced	30 grams
Evening feed	Egg	Boiled with shell	1
	Dressed Chicken Pieces	Boiled with bones	150 grams

Diet in the wild

They are omnivorous and opportunistically catch invertebrates and small vertebrates but also feed on plants and fruit.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

TENTATIVE DIET PLAN

Binturong

(Arctictis binturong)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms and beetles)	Whole	50 grams
	Dog food	Dry Pellets	100 grams
	Apple	Sliced	50 grams
	Figs	Whole	100 grams
	Plantains	Whole raw	100 grams
	Egg	Boiled with shell	2
Evening feed	Muskmelon		100 grams
	Papaya		100 grams

Diet in the wild

Omnivorous and opportunistic feeders, feeding mainly on fruit (especially figs), but also on insects, small mammals, birds and eggs. They are not particularly good hunters, and most of their diet is made up of wild fruits. Active during the day and night.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

MONGOOSES

TENTATIVE DIET PLAN

Banded Mongoose*(Mungos mungo)*

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms and beetles)	Whole	30 grams
	Royal Canin kitten Food	Dry Pellets	50 grams
	Apple	Sliced	30 grams
Evening feed	Egg	Boiled with shell	1
	Day old chicks	Whole with yolk sacs removed	2

Diet in the wild

Omnivorous, feeding mainly on insects, myriapods, small reptiles, and birds. Other prey includes rodents, snakes, frogs and wild fruits.

HYENAS

TENTATIVE DIET PLAN

Brown Hyena

(*Parahyaena brunnea*)

DAY	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Day 1	Buffalo meat on the Bone with skin	Fresh, raw	1.5 kg
	Panthera Supplement		15 grams
Day 2	Buffalo heart, Kidneys and liver	Fresh raw	1 kg
Day 3	Dressed Chicken	With skin and bones, fresh	1.5 kg
	Panthera Supplement		15 grams
Day 4	Buffalo meat on the Bone with skin	Fresh, raw	1.5 kg
	Panthera Supplement		15 grams
Day 5	Guinea fowl	Freshly killed	1
Day 6	Buffalo meat on the Bone with skin	Fresh, raw	1.5 kg
	Panthera Supplement		15 grams
Day 7	Fasting day		

Diet in the wild

Mostly carnivorous scavengers, the bulk of whose diet consists of carcasses killed by larger predators, but they may supplement their diet with rodents, insects, eggs, fruit and fungi.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status. Feeding should take place either early in the morning or in the late afternoon (once daily).

RACCOONS, COATIS & KINKAJOUS

TENTATIVE DIET PLAN

Raccoon

(*Procyon lotor*)

INDICATIVE TIME	FOOD ITEM	FORM	DAILY AMOUNT (DATA PER ANIMAL)
Morning feed	Insect mix (locusts, cockroaches, meal worms, super worms and beetles)	Whole	20 grams
	Dog food	Dry Pellets	20 grams
	Apple/Pear	Sliced	20 grams
	Carrots	Raw, sliced	20 grams
Evening feed	Egg	Boiled with shell	1
	Cashew nuts	Raw	20 grams

Diet in the wild

Highly adaptable and opportunistic omnivores, whose diet encompasses a wide range of animals and plants. Usually 40% invertebrates, 33% plants and 27% vertebrates.

Notes

Diet is for a single adult animal. Diet should be adjusted for level of activity and reproductive status.

Even-toed Ungulates

Order Artiodactyla

ANTELOPES & BISON

TENTATIVE DIET PLAN

Four-horned Antelope

(*Tetracerus quadricornis*)

Adult weight: 15–25 kg

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Morning	Fruits and vegetables	50 g
Forenoon	Maize fodder	1 kg
	Alfalfa fresh	100 g
	Deer / grazer / Cattle Pellets	250 g
Afternoon	Chickpea & Moong Dal - soaked	50 g
Evening	Agrimin forte	5 g
	Meadow hay / Timothy hay / Dongri hay	ad-lib
	Browse	1 kg

Notes

- Please provide Himalayan pink salt blocks, provide Minchat blocks
- Fruits and vegetables: Apple, watermelon, beetroot, carrot, cucumber, banana
- Hay will be recycled next day of feeding
- This diet will be reviewed as and when needed based on feedback/s from the site/s.
- Special diet of fruits, Vegetables, pulses – as per instructions

TENTATIVE DIET PLAN

American Bison

(Bison bison)

Adult weight: Males 500–1300 kg

Females 350–600 kg

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Morning	Napier	15 kg
	Alfalfa hay / Peanut hay	4 kg
	Mixed Vegetables (Carrot & Cucumber)	1.5 kg
	Cattle Pellets	3 kg
Afternoon	Flaxseed cake	500 g
Evening	Agrimmin forte	20 g
	Hay (Meadow/Dongri)	ad-lib

Notes

- Please provide Himalayan pink salt blocks, provide Minchat blocks
- Hay will be recycled next day of feeding
- This diet will be reviewed as and when needed based on feedback/s from the site/s.

GIRAFFES

TENTATIVE DIET PLAN

Southern Giraffe

(Giraffa giraffa)

INDICATIVE TIME	ITEM	QUANTITY PER ANIMAL 15-MARCH TO 31 MARCH
Morning	Browse (Minimum 4 varieties)	20 kg
Afternoon	Boskos Pellet	4 kg
	Browser Pellets	1 kg
	Flaxseed cake	100 g
	Agrimmin forte	50 g
Evening	Unchopped dry Alfalfa (Recycled next day)	4 kg
	Browse (Minimum 4 varieties)	15 kg

Notes

- Please provide Himalayan pink salt blocks, provide Minchat blocks
- Boskos pellets should be fed
- This diet will be reviewed as and when needed.

PIGS

TENTATIVE DIET PLAN

Red River Hog

(Potamochoerus porcus)

Body weight: ~10 kg single individual in Q3

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Morning (Remove by evening)	Napier fresh	500 g
	Alfalfa fresh	250 g
	Pellets	100 g
Forenoon	Vegetable mix: Carrot, Beetroot, cucumber, bottle gourd and sweet potato (coarse chopped - each 20%)	250 g
	Boiled potato with skin	1 No
	Boiled rice *	200 g
	Peanut *	25 g
	Salt*	5 g
	<i>*All the above three should be mixed together and fed</i>	
Afternoon	Leafy Vegetables	250 g
	Fruits – Banana/apple/papaya/watermelon	50 g

Notes

This diet will be reviewed as and when needed based on feedback/s from the site/s.

DEER

TENTATIVE DIET PLAN

Swamp Deer / Barasingha

(*Rucervus duvaucelii*)

Adult weight: 150–280 kg

TIME	FOOD ITEM	QUANTITY PER ANIMAL
Morning	Fruits and vegetables	250 g
Forenoon	Maize fodder	5 kg
	Alfalfa fresh	750 g
Afternoon	Deer / Grazer / Cattle Pellets	1.5 kg
	Chickpea & Moong Dal - soaked	100 g
	Agrimin forte	20 g
Evening	Meadow hay / Timothy hay / Dongri hay	ad-lib
	Browse	5 kg

Note

- Please provide Himalayan pink salt blocks
- Please provide Minchat blocks
- Fruits and vegetables: Apple, watermelon, beetroot, carrot, cucumber, banana
- Hay will be recycled next day of feeding
- This diet will be reviewed as and when needed based on feedback/s from the site/s.
- Special diet of fruits, vegetables, pulses – as per instructions

TENTATIVE DIET PLAN

Sambar Deer

(Rusa unicolor)

Weight: 150 to 300 kg

TIME	FOOD ITEM	QUANTITY PER ANIMAL
Morning 7:30	Deer Pellets	1 kg
Forenoon 10	Fresh maize fodder	6 kg
	Fresh Alfalfa	3 kg
Afternoon 3	Carrot	3 kg
	Beetroot	2 kg
Evening 5	Browse	6 kg
	Meadow / Timothy / Dongri hay	ad-lib
	Alfalfa hay	1 kg

Note

- Please provide Himalayan pink salt blocks
- Please provide Minchat blocks
- Hay will be recycled next day of feeding
- Browse contains about 25–35% leaves that are consumed, remaining major portion comprises non-consumed twigs and branches.
- This diet will be reviewed as and when required.

Odd-toed Ungulates

Order Perissodactyla

TAPIRS

TENTATIVE DIET PLAN

Lowland Tapir

(*Tapirus terrestris*)

INDICATIVE TIME	ITEM	ADULT	JUVENILE
8:00 – 14:00	Napier / leafy grass (Removal of last day's Pellets and browse)	2 kg	1 kg
11:30	Vegetables: Carrot, Cucumber, Sweet potato, Beetroot, Bottle gourd, Jicama (*Will be divided into two servings to avoid overconsumption.)	5 kg	2.5 kg
	*Equine specific vitamin & mineral supplements / Agrimin forte will be mixed	1 no	Half
14:00	Browse: 1. Jackfruit leaves, 2. Guava leaves, 3. Mulberry leaves, 4. Bamboo leaves, 5. Tamarind leaves, 6. Moringa leaves, 7. Mango leaves, 8. Ficus leaves, 9. Cordia leaves, 10. Bauhinia leaves (*Offer at least 4 varieties per day; *Tender leaves should be fed)	10 kg	5 kg
16:00	Vegetables: Carrot, Cucumber, Sweet potato, Beetroot, Bottle gourd (*Equine specific vitamin & mineral Supplements / Agrimin forte will be mixed)	2 kg	1.5 kg
	Pellets	500 g	400 g
17:00 – 20:00	Alfalfa hay & Meadow hay (*Mixed to avoid overconsumption of Alfalfa hay; *Unused hay will be removed every other day or if it gets wet, whichever is earlier. Natural salt block will be kept inside the dens / under the Shade)	Ad-lib	Ad-lib

Treat

Apple / Banana / Watermelon / Muskmelon mixed with Psyllium husk – 5 pieces per day (approximately 100 g) for conditioning and reinforcement training and as a prevention to avoid colic. The cutting and mixing will be carried out at the site.

Notes

- Modifications in the quantity and ingredients will be carried out as and when needed.

- Diet ingredients and quantities will be revised for different seasons – Summer, Monsoon and Winter.
- Based on the weights, growth rate and life stages, the diet will be revised as and when needed.

RHINOCEROSES

TENTATIVE DIET PLAN

Greater One-horned Rhinoceros

(*Rhinoceros unicornis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00	<i>Green fodder</i>	
	Napier grass, fresh	35 kg
	Alfalfa, fresh	10 kg
	Browse	20 kg
	Ficus leaves	8 kg
	Bauhinia (Mon, Fri), neem (Tue, Thu), bamboo (Wed, Sat, Sun)	5 kg
	Pellets (Rhino)	2.5 kg
	Anjir (fresh)	
17:00	<i>Green fodder</i>	
	Napier grass, fresh	35 kg
	Timothy, dried (hay)	15 kg
	Pellets (Rhino)	5 kg
	Anjir (fresh)	2.5 kg

Notes

Always offer a salt lick.

TENTATIVE DIET PLAN

Southern White Rhino

(*Ceratotherium simum*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Morning	Pellets (4 mm)	5 kg
	Bermuda grass	5 kg
	Chopped Napier	4 kg
	Green lucerne	2 kg
Afternoon	Pellets (4 mm)	5 kg
	Chopped Napier	4 kg
	Green lucerne	2 kg
Evening	Timothy hay / Dongri hay	ad-lib

Notes

- Please provide Himalayan pink salt blocks
- Please provide Minchat blocks
- Hay will be recycled next day of feeding
- This diet will be reviewed as and when needed based on feedback/s from the site/s.

ZEBRAS

TENTATIVE DIET PLAN

Plains Zebra

(*Equus quagga*)

Adult weight: Males 200–350 kg

Females 150–250 kg

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Morning	Meadow / Timothy hay	4 kg
	Fresh Alfalfa	1 kg
	Grazer / Horse Pellets	1 kg
Afternoon	Flaxseed cake	250 g
	Carrot – cut in long sections	200 g
	Agrimin forte	20 g
Evening	Meadow/Timothy	4 kg
	Alfalfa hay	1 kg

Notes

- Please provide Himalayan pink salt blocks
- Hay will be recycled next day of feeding
- This diet will be reviewed as and when needed based on feedback/s from the site/s.

Elephants

Order Proboscidea

TENTATIVE DIET PLAN

Asian Elephant

(*Elephas maximus*)

TIME · DAYS	FOOD ITEM	QUANTITY OF FOOD / INDIVIDUAL
8:30 · Everyday as per requirement; every day to special elephants	Ragi Laddu (Ragi flour + Ghee + Jaggery / Sugar)	1 piece (400 g)
	Rice + Jaggery + Bajra Flour, Ghee (Occasionally)	
	Chapati (Bajra + Maize Flour + Wheat flour + Black Salt)	1 Piece
	Cooked concentrate (Rice/Bajra Dalia + Whole mung dal + Half Mung + Masoor dal + Arhar dal + Urad dal + Jaggery + Ghee/Sesame oil)	5 kg
9:00 · Everyday	Green Fodder (Napier/Jowar), Lucerne	120-150 kg
9:00 · Everyday	Dry Fodder (Sorghum)	10 kg
5:30 · Everyday	Apple, Papaya, Watermelon, Banana, Sweetcorn	5-7 kg
	Cucumber	
12:00	Day 1 Sugarcane with leaves	2.90 kg
	Day 2 Banana leaves with stem	2.90 kg
	Day 3 Banyan tree leaves and branches	2.90 kg
	Day 4 Ficus tree leaves and branches	2.90 kg
	Day 5 Neem tree/Fig tree branches and leaves	2.90 kg
	Day 6 Napier grass	2.90 kg

Supplements

FREQUENCY	NAME OF SUPPLEMENT	DOSE (GM) / INDIVIDUAL
Daily	Agrimmin Forte	50
Weekly	Himalayan Batisa	150-200
	Asafoetida	50
	Carom seeds	50
	Rock salt/ Black salt/ Himalayan salt	50
	Jaggery	1000

CHAPTER

11

Birds

Class Aves

Waterfowl

Ducks, Geese & Shelducks

Gamebirds

Pheasants, Partridges & Turkeys

Pigeons & Doves

Order Columbiformes

Parrots

Order Psittaciformes

Eagles & Hawks

Order Accipitriformes

Falcons & Caracaras

Order Falconiformes

Owls

Order Strigiformes

Pelicans

Order Pelecaniformes

Darters

Order Suliformes

Storks

Order Ciconiiformes

Ibises & Spoonbills

Order Pelecaniformes

Flamingos

Order Phoenicopteriformes

Cranes & Jacanas

Hornbills

Order Bucerotiformes

Toucans & Aracaris

Order Piciformes

Perching Birds

Order Passeriformes

Waterfowl

Ducks, Geese & Shelducks

TENTATIVE DIET PLAN

Wood Duck

(*Aix sponsa*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	20 g
	Concentrate (Versele Laga country best duck 4)	120 g
	Duckweed (<i>Lemna trisulca</i>) - offer in a shallow dish with water	1 cupful
	Snails	3 pcs

Diet in the wild

Wood ducks are flexible omnivores and consume a huge range of seasonally available food. Most of their diet consists of aquatic plant matter, acorns, wheat, waterlily, sedge, and berries of various kinds.

Special characteristic

They also eat invertebrates, including beetles, snails, bugs, and flies.

TENTATIVE DIET PLAN

Bar-headed Goose

(*Anser indicus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (ground birds)	200 g
	Concentrate (Versele Laga Nutribird Best show 4)	300 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	200 g
13:00 – 18:00	Corn silage	500 g

Diet in the wild

These geese are herbivorous birds, primarily consuming a diet rich in aquatic plants, grasses, and other vegetation found in wetland environments.

Special characteristic

They use their specially adapted bills to grasp and pull up plant material from the water.

TENTATIVE DIET PLAN

Ashy-headed Goose

(*Chloephaga poliocephala*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (ground birds)	200 g
	Concentrate (Versele Laga Nutribird Best show 4)	300 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	200 g
13:00 – 18:00	Corn silage	500 g

Diet in the wild

Ashy-headed geese primarily feed on grasses and herbs, reflecting their adaptation to a grazing lifestyle. They prefer short, green grass, which they consume in large quantities.

Special characteristic

While they occasionally feed on aquatic plants and small invertebrates, these constitute a minor part of their diet.

TENTATIVE DIET PLAN

Andean Goose

(*Chloephaga melanoptera*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (ground birds)	200 g
	Concentrate (Versele Laga Nutribird Best show 4)	300 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	200 g
13:00 – 18:00	Corn silage	500 g

Diet in the wild

These geese feed mainly on plant material.

Special characteristic

When feeding in water, they submerge their heads and necks to reach aquatic plants, sometimes tipping forward like a dabbling duck.

TENTATIVE DIET PLAN

Australian Shelduck

(Tadorna tadornoides)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	20 g
	Concentrate (Versele Laga country best duck 4)	120 g
	Duckweed (<i>Lemna trisulca</i>) - offer in a shallow dish with water	1 cupful
	Alfalfa (fresh)	1 kg
	Snails	3 pcs

| Diet in the wild

The Australian Shelduck grazes on green grass on land or in shallow water. It also eats algae, insects and molluscs.

| Special characteristic

The Australian Shelduck prefers fresh waters and if in saltwater habitat, needs to be within easy reach of fresh water.

| Gamebirds

Pheasants, Partridges & Turkeys

TENTATIVE DIET PLAN

Kalij Pheasant

(Lophura leucomelanos)

TIME	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	30 g
	Pine nuts	5 g
	Concentrate (Versele Laga Nutribird Best show 4)	50 g
	Insects (mealworms, superworms, crickets, cockroaches, silkworms)	10 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	100 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g

| Diet in the wild

The Kalij pheasant has a diverse diet consisting of plants, insects, and small vertebrates.

| Special characteristic

It forages primarily on the forest floor for food.

TENTATIVE DIET PLAN

Grey Peacock Pheasant

(Polyplectron bicalcaratum)

TIME	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	30 g
	Concentrate (Versele Laga Nutribird Best show 4)	50 g
	Insects (mealworms, superworms, crickets, cockroaches, silkworms)	10 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	100 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g

Diet in the wild

The diet of this pheasant consists of seeds, plant material, acorns, berries, flower buds, leaves, and occasionally insects such as earthworms, millipedes, and termites.

Special characteristic

These pheasants get their food by digging.

TENTATIVE DIET PLAN

Double-spurred Spurfowl

(Pternistis bicalcaratus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	25 g
	Concentrate (Versele Laga Nutribird)	25 g
	Insect Mix (mealworms, superworms, crickets, cockroaches, silkworms)	10 pcs (2 of each)
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	100 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g

Diet in the wild

The double-spurred spurfowl eats seeds, fruits, grasses and insects.

Special characteristic

In the wild, plant and animal matter constituted 93.22% and 6.78% respectively.

TENTATIVE DIET PLAN

Grey-breasted Partridge

(*Arborophila orientalis*)

TIME	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	30 g
	Concentrate (Versele Laga Nutribird Best show 4)	50 g
	Insects (mealworms, superworms, crickets, cockroaches, silkworms)	10 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	100 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g

Diet in the wild

Grey-breasted partridges are predominantly herbivorous, feeding on leaves, seeds, and grains.

Special characteristic

They also consume insects, especially during the breeding season and in the early stages of their chicks' lives.

TENTATIVE DIET PLAN

Arabian Partridge

(Alectoris melanocephala)

TIME	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	30 g
	Concentrate (Versele Laga Nutribird Best show 4)	50 g
	Insects (mealworms, superworms, crickets, cockroaches, silkworms)	10 g
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	100 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g

Diet in the wild

The Arabian Partridge is omnivorous, feeding on a variety of plant matter and insects. They primarily consume seeds, berries, fruits, and tender shoots found in their arid habitat. Additionally, they actively forage for insects, such as beetles, ants, and grasshoppers, which provide them with necessary proteins and nutrients.

Special characteristic

A diverse diet ensures their survival in the harsh desert environment where food sources may be limited.

TENTATIVE DIET PLAN

Wild Turkey

(Meleagris gallopavo)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	150 g
	Concentrate (Versele Laga Country best show 4)	250 g
	Insects (mealworms, superworms, crickets, cockroaches, silkworms)	20 g
	<i>Offer all items in 1 bowl.</i>	
13:00 – 18:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	200 g

Diet in the wild

Wild turkeys have a generalist feeding habit. Their omnivorous diet consists of nuts, berries, seeds, leaves, moths, ants, and beetles.

Special characteristic

The hatchlings can feed and walk on their own soon after hatching.

Pigeons & Doves

Order Columbiformes

TENTATIVE DIET PLAN

Band-tailed Pigeon

(*Patagioenas fasciata*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (pigeon)	10 g
	Concentrate (Amul starter)	20 g
	<i>Offer both in one bowl.</i>	
	Sweetcorn (3 cm slice)	1 pcs
8:00 – 13:00	Protein mix (cutting 1 x 1 cm) 20% boiled Dal, 20% boiled Carrot, 20% papaya, 20% green Peas without shell, 20% Muskmelon	50 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g
	Fig (fresh, cut 1 by 2) – when in season	1 pcs (half pcs)

Diet in the wild

In the wild, the pigeon's diet includes nuts, seeds, berries, blossoms and insects; in autumn they gorge on acorns.

Special characteristic

In addition to acorns and other seeds, Band-tailed pigeons will seasonally consume fruits such as Pacific madrone and toyon berries.

TENTATIVE DIET PLAN

Common Bronze-winged Pigeon

(*Phaps chalcoptera*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (pigeon)	10 g
	Concentrate (Amul starter)	20 g
	Sweetcorn (3 cm slice)	1 pcs
8:00 – 13:00	Protein mix (cutting 1 x 1 cm) 20% boiled Dal, 20% boiled Carrot, 20% papaya, 20% green Peas without shell, 20% Muskmelon	50 g
13:00 – 18:00	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
	Amaranth, green (one plant in total)	1 pcs

Diet in the wild

The common bronzewing is a ground feeder and eats a higher proportion of vegetable matter. The diet contains seeds, grains, grasses, nuts, berries etc.

Special characteristic

Dehydration is a big issue in this pigeon. It needs to drink frequently. In the wild it makes sure to take advantage of any water holes and other available sources of water along its route. As it has a special sense of water, people in the outback would use these birds to find water.

Note

Ensure a sufficient water supply.

TENTATIVE DIET PLAN

Ashy Wood Pigeon

(*Columba pulchricollis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (pigeon)	10 g
	Concentrate (Amul starter)	20 g
	<i>Offer both in one bowl.</i>	
	Sweetcorn (3 cm slice)	1 pcs
8:00 – 13:00	Protein mix (cutting 1 x 1 cm) 20% boiled Dal, 20% boiled Carrot, 20% papaya, 20% green Peas without shell, 20% Muskmelon	50 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	50 g
	Fig (fresh, cut 1 by 2) – when in season	1 pcs (half pcs)

Diet in the wild

In the wild, the ashy wood pigeon feeds mainly on fruits and berries, as well as seeds, buds and acorns, foraging mostly in the tree canopy of forests.

Special characteristic

Pigeons produce a crop milk for their young.

TENTATIVE DIET PLAN

Zebra Dove

(Geopelia striata)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 g
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
13:00 – 18:00	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
	Protein mix (25% toor Dal boiled, 25% moong Dal boiled, 25% masoor Dal, boiled, 25% green peas without shell, fresh)	15 g
	+ mealworms (dried, coarse grated)	1 g

Diet in the wild

Zebra doves are omnivorous, meaning that they eat both plants and animals. Their diet consists of seeds, small insects, and even fruit.

Special characteristic

They have a unique way of feeding, where they take small bites of food and then tilt their heads back to swallow. This behaviour helps them digest their food better and avoid choking.

TENTATIVE DIET PLAN

White-faced Cuckoo Dove

(*Turacoena manadensis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 g
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
13:00 – 18:00	Fruit/veg mix (cutting size 1 x 1 cm) (25% papaya, 25% cucumber, 25% muskmelon, 25% apple)	30 g

Diet in the wild

White-faced Cuckoo-Doves feed on fruit, berries and seeds from a variety of rainforest trees, shrubs and vines.

Special characteristic

They usually feed in the trees in the early morning and the late afternoon, often hanging upside down to reach fruit. They come to the ground to drink and to eat grit. They can digest very hard seeds.

TENTATIVE DIET PLAN

Bar-shouldered Dove

(Geopelia humeralis)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 g
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
13:00 – 18:00	Protein mix (25% toor Dal boiled, 25% moong Dal boiled, 25% masoor Dal, boiled, 25% green peas without shell, fresh)	15 g
	+ mealworms (dried, coarse grated)	1 pcs

Diet in the wild

These doves are omnivorous, meaning that they eat both plants and animals. Their diet consists of seeds, small insects, and even fruit.

Special characteristic

They have a unique way of feeding, where they take small bites of food and then tilt their heads back to swallow. This behaviour helps them digest their food better and avoid choking.

TENTATIVE DIET PLAN

Beautiful Fruit Dove

(Ptilinopus pulchellus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 g
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Fruit/veg mix (cutting size 1 x 1 cm) (25% papaya, 25% cucumber, 25% muskmelon, 25% apple)	30 g

Diet in the wild

In terms of diet, the beautiful fruit dove primarily feeds on fruits, hence its name. It has a preference for a variety of fruits such as figs, berries, and various tropical fruits.

Special characteristic

They have a unique way of feeding, where they take small bites of food and then tilt their heads back to swallow. This behaviour helps them digest their food better and avoid choking.

TENTATIVE DIET PLAN

Banded Fruit Dove

(Ptilinopus cinctus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 pcs
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Fruit/veg mix (cutting size 1 x 1 cm) (25% papaya, 25% cucumber, 25% muskmelon, 25% apple)	30 g

Diet in the wild

The banded fruit dove's diet includes not only fruits but also flowers and nectar.

Special characteristic

They have a unique way of feeding, where they take small bites of food and then tilt their heads back to swallow. This behaviour helps them digest their food better and avoid choking.

TENTATIVE DIET PLAN

Barbary Dove

(*Streptopelia roseogrisea*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 g
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
13:00 – 18:00	Protein mix (25% toor Dal boiled, 25% moong Dal boiled, 25% masoor Dal, boiled, 25% green peas without shell, fresh)	15 g
	+ mealworms (dried, coarse grated)	1 pcs

Diet in the wild

These doves are omnivorous, meaning that they eat both plants and animals. Their diet consists of seeds, small insects, and even fruit.

Special characteristic

They have a unique way of feeding, where they take small bites of food and then tilt their heads back to swallow. This behaviour helps them digest their food better and avoid choking.

TENTATIVE DIET PLAN

Barred Cuckoo Dove

(*Macropygia unchall*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (doves)	10 g
	Pellets (Versele Laga Uni komplet)	20 g
	<i>Mix these 2 items in one bowl.</i>	
	"Laying mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	1 pcs
	<i>Offer the laying mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
	Wheat grass (bowl with germinated wheat, growing high around 5 cm)	1 pcs
13:00 – 18:00	Fruit/veg mix (cutting size 1 x 1 cm) (25% papaya, 25% cucumber, 25% muskmelon, 25% apple)	30 g

Diet in the wild

The barred cuckoo-dove feeds mainly on fruits and berries, especially small figs, along with some seeds, buds and shoots.

Special characteristic

These doves are mostly arboreal and occasionally they feed on the ground.

Parrots

Order Psittaciformes

PARROTS & PARAKEETS

TENTATIVE DIET PLAN

Australian King Parrot

(*Alisterus scapularis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parakeet)	5 g
	Pellets (Versele Laga Nutribird G18)	15 g
	Sweetcorn (approx. 3 cm slice)	1 pcs
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (20% cucumber, 20% boiled Carrots, 20% boiled Pumpkin, 20% boiled kidney beans, 20% green peas without shell)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g

Diet in the wild

In the wild, they primarily feast on fruit, nuts, and seeds.

Special characteristic

King parrots are so active that obesity is typically not as big an issue.

TENTATIVE DIET PLAN

Azure-rumped Parrot

(*Tanygnathus sumatranus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parrot)	10 g
	Pellet (Versele Laga Nutribird P19)	15 g
	Sweetcorn (3 cm slice)	1 pcs
	Oil palm fruits	2 pcs
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (25% boiled Pumpkin, 25% boiled Carrot, 25% green peas without shell, 25% boiled toor Dal)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g

Diet in the wild

Diet includes fruits, nuts, seeds and berries, and occasionally cultivated crops such as maize.

Special characteristic

Seasonal variations in diet correspond with the availability of fruits, leading to shifts in feeding patterns throughout the year.

TENTATIVE DIET PLAN

Black-capped Parakeet

(*Pyrrhura rupicola*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parakeet)	5 g
	Pellet (Versele Laga Nutribird G18)	15 g
	Sweetcorn (3 cm slice)	1 pcs
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (20% cucumber, 20% boiled Carrots, 20% boiled Pumpkin, 20% boiled kidney beans, 20% green peas without shell)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g

Diet in the wild

This bird primarily eats a variety of fruits, nuts, seeds, berries and flowers.

Special characteristic

Always soak and cook your legumes; uncooked dry beans contain some enzyme inhibitors that are indigestible in birds and lead to reduced protein utilisation.

TENTATIVE DIET PLAN

Caatinga Parakeet

(*Aratinga cactorum*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parakeet)	5 g
	Pellet (Versele Laga Nutribird G18)	15 g
	Sweetcorn (3 cm slice)	1 pcs
	Cactus fruit (cut 1 by 2)	1 pcs
	“Mineral mix” (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	10 g
	<i>Offer the mineral mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (25% boiled Pumpkin, 25% boiled Carrot, 25% green peas without shell, 25% boiled toor Dal)	20 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	20 g

Diet in the wild

Due to the environment the Caatinga parakeet populates, their diet mainly consists of cactus seeds, fruits and berries which can be found in the desert terrain of the Caatinga area.

Special characteristic

These parakeets are also known to forage crops such as rice, corn, and grapes.

TENTATIVE DIET PLAN

Austral Parakeet

(Enicognathus ferrugineus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parakeet)	5 g
	Pellet (Versele Laga Nutribird G18)	15 g
	Sweetcorn (3 cm slice)	1 pcs
	"Mineral mix" (egg shell, mussel shells, cuttlefish bones, grit, ground in particles of approx. 3 x 3 mm)	10 g
	<i>Offer the mineral mix in a separate bowl and let the bowl always in (never remove, only fill up from time to time)</i>	
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (25% boiled Pumpkin, 25% boiled Carrot, 25% green peas without shell, 25% boiled toor Dal)	20 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	20 g

Diet in the wild

Austral Parakeets thrive on a variety of seeds, fruits, and berries found in their natural bird habitats, often visiting feeders for supplemental food.

Special characteristic

They adapt their diet seasonally, depending on what nature offers, including available habitats.

TENTATIVE DIET PLAN

Alexandrine Parakeet

(Psittacula eupatria)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga G 18)	20 g
	Seed mix (parakeet)	10 g
	Sweetcorn (3 cm slice)	1 pcs
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (25% boiled Pumpkin, 25% boiled Carrot, 25% green peas without shell, 25% boiled toor Dal)	20 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g

Diet in the wild

Alexandrine parakeets are herbivores (granivores, frugivores) and their diet includes a variety of wild and cultivated seeds, buds, fruits, and nuts.

Special characteristic

They love figs and mangoes, but don't feed avocados as these are toxic for them.

LORIKEETS

TENTATIVE DIET PLAN

Biak Lorikeet

(*Trichoglossus rosenbergii*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Sweetcorn (3 cm slice)	1 pcs
8:00 – 11:00	Lory soup	200 g
11:00 – 13:00	Lory soup	200 g
13:00 – 15:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	1 pcs
15:00 – 18:00	Lory soup	200 g

Diet in the wild

Nectarivores that feed on pollen, nectar, flowers, soft fruits, and insects.

Special characteristic

Lories and lorikeets have specialised brush-tipped tongues (tufts of papillae = extremely fine hairs), which collect nectar and pollen. Food has to be changed frequently to avoid spoilage.

COCKATOOS

TENTATIVE DIET PLAN

Citron-crested Cockatoo

(Cacatua citrinocristata)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (parakeet)	10 g
	Pellet (Versele Laga Nutribird G18)	20 g
	Mealworm	2 pcs
	<i>Offer the first three items in one bowl.</i>	
	Sweetcorn (approx. 3 cm slice)	1 pcs
8:00 – 13:00	Vegetable mix (cutting size 1 x 1 cm) (20% cucumber, 20% boiled Carrots, 20% boiled Pumpkin, 20% boiled kidney beans, 20% green peas without shell)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g

Diet in the wild

In the wild, this bird eats seeds, nuts, berries, and fruits.

Special characteristic

Like all cockatoos, citrons are prone to weight gain, therefore the fat intake has to be limited.

Eagles & Hawks

Order Accipitriformes

TENTATIVE DIET PLAN

African Hawk-eagle

(*Aquila spilogaster*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Guinea fowl* (cut 1 by 4)	1 pcs
	Day 2	Buffalo heart (cut)	250 g
		Mineral (Agrimin forte)	¼ spoon
	Day 3	~Hunger day	--
	Day 4	Rat*	1 pcs
	Day 5	Rabbit* (cut 1 by 4)	1 pcs
	Day 6	Buffalo meat (cut)	250 g
		Mineral (Agrimin forte)	¼ spoon
	Day 7	~Hunger day	--

*Without gastrointestinal tract

Diet in the wild

The African hawk-eagle mainly eats birds such as francolin or guinea fowl. This eagle also feeds on reptiles and small mammals such as mongooses and dassies.

Special characteristic

They typically hunt from a perch from which they intercept their prey.

TENTATIVE DIET PLAN

African Fish Eagle

(*Haliaeetus vocifer*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Fish (catla, in total, 2-3 pcs)	800 g
	Day 2	Fish (catfish, in total)	800 g
		Mineral (Agrimin forte)	¼ spoon
	Day 3	~Hunger day	--
	Day 4	Fish (catla, 2–3 pcs)	800 g
	Day 5	Fish (catfish, in total, 2 – 3 pcs)	800 g
	Day 6	Chicken (with bones and organs, cut in 2 pieces)	600 g
		Mineral (Agrimin forte)	¼ teaspoon
	Day 7	~Hunger day	--

Diet in the wild

African fish eagles are carnivores (piscivores) and feed mainly on fish.

Special characteristic

They also prey on birds, especially waterbirds such as ducks, ibis, storks, herons, greater and lesser flamingos, small turtles and terrapins, baby crocodiles, lizards, frogs, and carrion.

TENTATIVE DIET PLAN

Bald Eagle

(*Haliaeetus leucocephalus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Guinea fowl* (cut 1 by 2)	1 pcs
	Day 2	Fish (catla or catfish, offer in total, approx. 7 inch)	500 g
	Day 3	Goat head (cut 1 by 2)	1 pcs
	Day 4	Rat* (in total)	2 pcs
	Day 5	Rabbit** (cut 1 by 2)	1 pcs
	Day 6	Buffalo meat (cut)	350 g
		Mineral (Agrimin forte)	½ spoon
	Day 7	~Hunger day	--

*Without gastrointestinal tract ** dressed, without gastrointestinal tract, with organs/bones

Diet in the wild

Bald eagles are carnivorous and eat mostly fish and other birds. Mammals make up a small percentage of their usual diet. Bald eagles have been recorded hunting and eating some 400 species, including some large animals like deer fawns.

Special characteristic

They're opportunistic predators and will eat both living animals and carrion.

TENTATIVE DIET PLAN

Black Hawk-eagle
(*Spizaetus tyrannus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Guinea fowl* (cut 1 by 4)	1 pcs
	Day 2	Buffalo heart (cut)	250 g
		Mineral (Agrimin forte)	¾ spoon
	Day 3	~Hunger day	--
	Day 4	Rat*	1 pcs
	Day 5	Rabbit* (cut 1 by 4)	1 pcs
	Day 6	Buffalo heart (cut)	250 g
		Mineral (Agrimin forte)	¾ spoon
	Day 7	~Hunger day	--

*Without gastrointestinal tract

Diet in the wild

While its preferred diet is mainly mammals including marmosets, squirrels, squirrel monkeys, opossums, and bats, it will also hunt large birds including chachalacas, macaws, toucans, and guans.

Special characteristic

It usually moves from tree to tree above or below the forest canopy, listening or looking for prey.

Falcons & Caracaras

Order Falconiformes

TENTATIVE DIET PLAN

Gyr Falcon

(*Falco rusticolus*)

TIME	DAYS	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Quail (dressed, without gastrointestinal tract)	1 pcs
		Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 2	Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 3	Quail (dressed, without gastrointestinal tract)	1 pcs
		Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 4	Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 5	Quail (dressed, without gastrointestinal tract)	1 pcs
		Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 6	Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g
	Day 7	Quail (dressed, without gastrointestinal tract)	1 pcs
		Rat (dressed, without gastrointestinal tract)	1 pcs
		Chicken meat (cut in strips)	20 g
		Chicken liver (cut in strips)	20 g

Diet in the wild

Birds make up most of the gyrfalcon's diet. They also prey on small- to medium-sized mammals. Moreover, gyrfalcons are known to occasionally eat insects to supplement their diet.

Special characteristic

Known for its incredible speed and ruthless hunting abilities, the gyrfalcon has a varied diet that reflects its role as an apex predator.

TENTATIVE DIET PLAN

Pygmy Falcon

(*Polihierax semitorquatus*)

TIME	DAYS	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 18:00	Daily	Insect mix (mealworm, maggot, cricket)	20 g
	Day 1	Quail* (dressed, cut 1 by 4)	1 pcs
	Day 2	Rat* (dressed, cut 1 by 4)	1 pcs
	Day 3	Mutton (meat; in strips)	30 g
	Day 4	Mice	1 pcs
	Day 5	Finch	1 pcs
	Day 6	Rabbit* (coarse chopped)	100 g
	Day 7	Mutton (meat; in strips)	30 g

Diet in the wild

The pygmy falcon's primary diet consists of insects, small reptiles, and birds, although they have been observed feeding on small mammals.

Special characteristic

They are typically seen in pairs or small family groups and exhibit a unique form of polyandry, with some females maintaining two mates.

TENTATIVE DIET PLAN

Crested Caracara

(*Caracara plancus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Guinea fowl* (cut 1 by 4)	1 pcs
	Day 2	Buffalo heart (cut)	200 g
		Mineral (Agrimin forte)	1/4 spoon
	Day 3	Chicken neck	1 pcs
	Day 4	Rat*	2 pcs
	Day 5	Rabbit* (cut 1 by 4)	1 pcs
	Day 6	Buffalo heart (cut)	200 g
		Mineral (Agrimin forte)	1/4 spoon
	Day 7	~Hunger day	--

*without gastrointestinal tract

Diet in the wild

Crested caracaras are carnivores and scavengers. They mainly feed on carrion, but they also eat insects, invertebrates, reptiles, fish, amphibians, mammals, birds, and eggs.

Special characteristic

The crested caracara's diverse and adaptable feeding habits allow it to thrive in various environments and conditions.

TENTATIVE DIET PLAN

Yellow-headed Caracara

(*Milvago chimachima*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
10:00 – 10:00 next day	Day 1	Guinea fowl* (cut 1 by 4)	1 pcs
	Day 2	Buffalo heart (cut)	200 g
		Mineral (Agrimin forte)	¾ spoon
	Day 3	Chicken neck	1 pcs
	Day 4	Rat*	2 pcs
	Day 5	Rabbit* (cut 1 by 4)	1 pcs
	Day 6	Buffalo meat (cut)	200 g
		Mineral (Agrimin forte)	¾ spoon
	Day 7	~Hunger day	--

Diet in the wild

The yellow-headed caracara has been described as a dietary generalist and opportunist; the species preys on insects, mammals, birds, fish, and crabs.

Special characteristic

The caracara's diverse and adaptable feeding habits allow it to thrive in various environments and conditions.

Owls

Order Strigiformes

BARN OWLS

TENTATIVE DIET PLAN

Barn Owl

(*Tyto alba*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
17:00 – 17:00 next day	Day 1	Mice (in total)	3 pcs
	Day 2	Day-old Chicken (in total)	2 pcs
	Day 3	Rat*	1 pcs
	Day 4	Guinea pig (cut 1 by 2)	1 pcs
	Day 5	Mice (in total)	3 pcs
	Day 6	Rabbit* (cut 1 by 4)	1 pcs
	Day 7	Day old Chicken (in total)	2 pcs

*without gastrointestinal tract

Diet in the wild

The major portion of barn owls' diet consists of small mammals especially rodents like mice, rats, voles, shrews, and lemmings.

Special characteristic

Barn owls are often seen searching for prey either in a slow, low flight or perched somewhere they can clearly observe the ground. They swoop down to catch the prey the moment they spot or hear one.

TYPICAL OWLS

TENTATIVE DIET PLAN

African Wood Owl

(Strix woodfordii)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
Daily		Insect mix (crickets, mealworm, cockroaches)	6 pcs (2 in each)
17:00 – 17:00 next day	Day 1	Mice (in total)	2 pcs
	Day 2	Day old Chicken (in total)	2 pcs
	Day 3	Rat* (cut 1 by 2)	1 pcs
	Day 4	Guinea pig (cut 1 by 2)	1 pcs
	Day 5	Mice (in total)	2 pcs
	Day 6	Rabbit* (cut 1 by 4)	1 pcs
	Day 7	Day old Chicken (in total)	2 pcs

*Without gastrointestinal tract

Diet in the wild

The African wood owl's diet is primarily composed of insects, but it will also consume reptiles, small mammals, and birds.

Special characteristic

It typically hunts by perching and swooping down on its prey.

TENTATIVE DIET PLAN

Marsh Owl

(*Asio capensis*)

TIME	DAYS	FOOD ITEM	DAILY AMOUNT (DATA PER ANIMAL)
17:00 – 17:00 next day	Day 1	Mice (in total)	2 pcs
	Day 2	Day old Chicken (in total)	1 pcs
	Day 3	Rat (cut 1 by 2)	1 pcs
	Day 4	Guinea pig (cut 1 by 4)	1 pcs
	Day 5	Mice (in total)	2 pcs
	Day 6	Rabbit* (cut 1 by 4)	1 pcs
	Day 7	Day old Chicken (in total)	1 pcs

*Without gastrointestinal tract

Diet in the wild

Marsh owls are carnivores which will feed on invertebrates and small animals such as rodents, bats, birds, frogs and lizards. They are opportunistic feeders which will eat whatever they can find.

Special characteristic

When hunting they swoop low over the ground to seek out likely prey items. To help find insects they will hang around lights. During the breeding season they will cache food which can then be consumed later.

Pelicans

Order Pelecaniformes

TENTATIVE DIET PLAN

Australian Pelican

(Pelecanus conspicillatus)

Great White Pelican

(Pelecanus onocrotalus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
9:00	Fish (different species of fish; size around 10 – 12 cm)	700 g
11:00	One fish — Cut open a fish and put 5 g of the mineral powder in it. Squeeze the fish shut again. Prepare so many fish that each pelican gets one fish	1 pcs
13:00	Pellets (Versele Laga floating allround)	200 g
15:00	Fish (alive) — Transfer the fish to a container with fresh water at least one hour before feeding. Then put the fish into the pond without the water from the container.	600 g

Diet in the wild

Pelicans are carnivorous and eat a diet of mostly fish, but sometimes include small reptiles, amphibians, and aquatic crustaceans.

Special characteristic

It hunts for food in both freshwater and marine environments, sometimes diving slightly below the surface, but never to a great depth.

I Darters

Order Suliformes

TENTATIVE DIET PLAN

African Darter

(*Anhinga rufa*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
11:00	Day 1	Fish (Mullet, in total, approx. 10 cm long)	350 g
	Day 2	Fish (Catfish, in total, approx. 10 cm long)	350 g
		Mineral (Agrimin forte: make a cut in the fish and put the powder in)	¼ spoon
	Day 3	~Hunger day	--
	Day 4	Fish (Silverside fish, in total, 8 - 12 cm long)	350 g
	Day 5	Fish (Catla, in total, approx. 10 cm long)	350 g
	Day 6	Fish (Tilapia, in total, approx. 10 cm long)	350 g
		Mineral (Agrimin forte)	¼ teaspoon
	Day 7	Fish (Catfish, in total, approx. 10 cm long)	350 g

I Diet in the wild

The African darter’s primary diet consists of fish, which it hunts with remarkable skill.

I Special characteristic

Its body is specially adapted for an aquatic hunting lifestyle; it has webbed feet for propulsion and a long, sharp bill for spearing fish underwater. When hunting, the darter submerges itself and can swim long distances underwater to approach its prey stealthily. Once it spots a target, it uses its powerful neck and bill to spear the fish with precision.

Storks

Order Ciconiiformes

TENTATIVE DIET PLAN

Yellow-billed Stork

(*Mycteria ibis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets	200 g
	Fish (alive) Freshwater fish (approx. 18 cm; 7 inches)	500 g
10:00	Day-old chick (in total)	3 pcs
12:00	Freshwater prawns (alive)	500 g
16:00	Crabs (alive)	3 pcs

Diet in the wild

They eat mainly fish (piscivorous). Opportunistically eat crabs, shrimp, frogs, small mammals, reptiles and young birds.

Special characteristic

When hunting they stand still or walk slowly, stabbing their bill into the water to grab any prey that they contact.

Ibises & Spoonbills

Order Pelecaniformes

TENTATIVE DIET PLAN

American White Ibis

(*Eudocimus albus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Country best floating allround)	60 g	
	Fish (alive, around 2 inch)	10 pcs	
13:00	Day 1	Shrimps (with shell)	35 g
	Day 2	Crickets	35 g
	Day 3	Shrimps (with shell)	35 g
	Day 4	Crabs (cut in cubes of 2 x 2 cm)	35 g
	Day 5	Crickets	25 g
	Day 6	Shrimps (with shell)	35 g
	Day 7	Crabs (cut in cubes of 2 x 2 cm)	35 g

Diet in the wild

American white ibis feed on insects such as aquatic beetles, dragonflies, damselflies, grasshoppers, crickets, flies and caddisflies. Their diet also includes leeches, molluscs, crustaceans and occasionally fish, amphibians, lizards, small snakes, and nestling birds.

Special characteristic

Offer the food in water (pond, plate etc.).

TENTATIVE DIET PLAN

African Sacred Ibis

(*Threskiornis aethiopicus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Country best floating allround)	60 g	
	Fish (alive, around 2 inch)	10 pcs	
13:00	Day 1	Shrimps (with shell)	35 g
	Day 2	Crickets	35 g
	Day 3	Shrimps (with shell)	35 g
	Day 4	Crabs (cut in cubes of 2 x 2 cm)	35 g
	Day 5	Crickets	25 g
	Day 6	Shrimps (with shell)	35 g
	Day 7	Crabs (cut in cubes of 2 x 2 cm)	35 g

Diet in the wild

The ibis feed on insects such as aquatic beetles, dragonflies, damselflies, grasshoppers, crickets, flies and caddisflies. Their diet also includes leeches, molluscs, crustaceans and occasionally fish, amphibians, lizards, small snakes, and nestling birds.

Special characteristic

Offer the food in water (pond, plate etc.).

TENTATIVE DIET PLAN

African Spoonbill

(*Platalea alba*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellets (Versele Laga Floating allround)	70 g
10:00		Small fish (alive; around 2 inch)	10 pcs
13:00	Day 1	Shrimps (with shell)	40 g
	Day 2	Insects (crickets, silkworm)	30 g
	Day 3	Shrimps (with shell)	40 g
	Day 4	Fish (cut in cubes of 2 x 2 cm)	40 g
	Day 5	Insects (crickets, silkworm)	30 g
	Day 6	Shrimps (with shell)	40 g
	Day 7	Fish (cut in cubes of 2 x 2 cm)	40 g

Diet in the wild

African spoonbills eat small fish and aquatic invertebrates. They wade in shallow water in small groups of up to 10 birds.

Special characteristic

They sweep their beaks side to side, or use them to probe the soft mud.

Flamingos

Order Phoenicopteriformes

TENTATIVE DIET PLAN

American Flamingo

(*Phoenicopterus ruber*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellet (Versele Laga Country Best floating allround)	120 g
13:00 – 18:00	Day 1	Shrimps (with shell) – minced + canthaxanthin*	100 g
	Day 2	Fish (minced) + canthaxanthin*	70 g
	Day 3	Shrimps (with shell) – minced	100 g
	Day 4	Fish (minced) + canthaxanthin*	70 g
	Day 5	Shrimps (with shell) – minced	100 g
	Day 6	Fish (minced) + canthaxanthin*	70 g
	Day 7	Shrimps (with shell) – minced	100 g

*Canthaxanthin dosage

MINCED FISH OR SHRIMP (G)	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
AMOUNT OF CANTHAXANTHIN (G)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2

Diet in the wild

Mainly feeding on invertebrates like brine flies, shrimps, and molluscs, they also consume blue-green algae, aquatic plants, seeds, insect larvae, and small worms.

Special characteristic

They also get their pink colour from carotenoids.

Cranes & Jacanas

CRANES

TENTATIVE DIET PLAN

Demoiselle Crane

(*Anthropoides virgo*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	70 g
	Concentrate (Versele Laga Nutribird Crane)	70 g
	Insect Mix (mealworms, superworms, crickets, cockroaches, silkworms)	10 pcs (2 in each)
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	150 g
13:00 – 18:00	Chana Dal (soaked/ begin sprouting)	50 g

Diet in the wild

Demoiselle cranes are omnivores; they mainly eat the seeds of grasses as well as cereal grains.

Special characteristic

They also eat insects such as beetles (Coleoptera), as well as lizards, worms and small vertebrates.

TENTATIVE DIET PLAN

Sarus Crane

(Grus antigone)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Seeds (ground birds)	80 g
		Concentrate (Versele Laga Nutribird Crane)	100 g
		Insect Mix (mealworms, superworms, crickets, cockroaches, silkworms)	6 pcs (2 in each)
		<i>Offer all items in 1 bowl</i>	
13:00 – 17:00	Day 1	Water hyacinth	200 g
	Day 2	Fish (whole, around 10 cm long)	150 g
	Day 3	Cockroaches (frozen)	50 g
	Day 4	Watermelon, muskmelon (2 x 2 cm)	200 g
	Day 5	Egg (boiled, with shell, cut 1 by 2)	1 pcs
	Day 6	Fish (whole, around 10 cm long)	150 g
	Day 7	Herbal mix	100 g

Diet in the wild

Their diet consists of insects, aquatic plants, fish, crustaceans, and seeds. Occasionally, they will eat water snakes, bird eggs, and turtles.

Special characteristic

They forage in shallow waters and fields by probing the mud with their long bills. These birds do not feed in large flocks.

TENTATIVE DIET PLAN

Blue Crane

(*Grus paradisea*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seeds (ground birds)	70 g
	Concentrate (Versele Laga Nutribird Crane)	70 g
	Insect Mix (mealworms, super worms, crickets, cockroaches, silkworms)	10 pcs (2 in each)
	<i>Offer all items in 1 bowl.</i>	
8:00 – 13:00	Leafy vegetable mix (Grated: 20% Carrots, 20% Beetroot; Grated: 60% herbal mix)	200 g
13:00 – 18:00	Crabs (coarsely chopped)	3 pcs

Diet in the wild

Most of their diet is composed of grasses and sedges. They also regularly eat insects such as grasshoppers. Small animals such as crabs, snails, frogs, small lizards and snakes may supplement the diet.

Special characteristic

Prey animals are often broken down and fed to the young.

JACANAS

TENTATIVE DIET PLAN

African Jacana

(Actophilornis africanus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 13:00	Insect mix (mealworms, crickets, maggots)	25 g
	Pellets (Versele Laga Allround floating)	25 g
	Duckweed (<i>Lemna trisulca</i>) Offer in a shallow dish with water	1 cupful
	Snails	25 g
	Chicken (minced, offer with the Pellets in water)	20 g
13:00 – 18:00	Insect mix (mealworms, crickets, maggots)	25 g
	Pellets (Versele Laga Allround floating)	25 g
	Duckweed (<i>Lemna trisulca</i>) Offer in a shallow dish with water	1 cupful
	Snails	25 g
	Chicken (minced, offer with the Pellets in water)	20 g

Diet in the wild

African jacanas are carnivores (insectivores, vermivores, molluscivores). They eat various insects, worms, spiders, crustaceans, molluscs, and snails.

Special characteristic

African jacanas are polyandrous, meaning that one female mates with multiple males and the male alone cares for the chicks.

Hornbills

Order Bucerotiformes

GROUND HORN BILLS

TENTATIVE DIET PLAN

Abyssinian Ground-hornbill

(*Bucorvus abyssinicus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellets (Versele Laga Nutribird H16; in case the Pellets are not eaten put a little bit of juice on it, avoid making a slurry)	150 g
		Oil palm fruits	3 pcs
		<i>Mix Pellets and oil palm fruits in one bowl</i>	
		Insect mix (superworms, cockroaches, crickets, maggots)	150 g
		Meat mix (rabbit meat, rats, buffalo liver; cut in 3 x 3 cm)*	500 g
8:00 – 13:00	Day 1	Day-old Chicken	3 pcs
	Day 2	Mice	5 pcs
	Day 3	Paneer (pieces of 1 x 1 cm)	8 pcs
	Day 4	Pinkies	10 pcs
	Day 5	Chicken neck (raw)	2 pcs
	Day 6	Mice	5 pcs
	Day 7	Chicken head (cut 1 by 2)	10 pcs
13:00 – 18:00		Fruit mix (cutting size 2 x 2 cm) (50% papaya, 50% muskmelon)	60 g
		Cherry tomatoes	5 pcs

Diet in the wild

Its diet includes insects, rodents, snakes, frogs, and other birds. It also consumes plant matter like seeds, berries, and fruits.

Special characteristic

They typically hunt by walking over their habitat and catching prey on or under the ground.

HORNBILLS

TENTATIVE DIET PLAN

Black-and-white-casqued Hornbill

(Bycanistes subcylindricus)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellets (Versele Laga Nutribird H16; in case the Pellets are not eaten put a little bit juice on it, avoid making a slurry)	60 g
		Oil palm fruits	6 pcs
		<i>Mix Pellets and oil palm fruits in one bowl</i>	
8:00 – 13:00	Day 1	Figs (in total)	2 pcs
	Day 2	Insect mix *	30 g
	Day 3	Pinkies	5 pcs
	Day 4	Paneer (pieces of 1 x 1 cm)	8 pcs
	Day 5	Chicken neck (raw)	1 pcs
	Day 6	Insect mix *	30 g
	Day 7	Chicken head (cut 1 by 2)	2 halves
13:00 – 18:00		Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	60 g

*(25% mealworms, 25% superworms, 25% cockroaches, 25% crickets)

Diet in the wild

The diet consists mainly of figs, fruits, insects, and small animals found in the trees. 90% of the food is vegetable, mainly figs and especially oil palm fruits.

Special characteristic

Hornbills are opportunistic predators and will eat small animals if they can catch them. Some feed upon relatively dangerous animals (poisonous snakes and scorpions). Hornbills handle their prey with great skill, using the very tip of their bill. They can peel bulky fruit, again using their large bill.

TENTATIVE DIET PLAN

Writhed Hornbill

(*Rhabdotorrhinus leucocephalus*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellets (Versele Laga Nutribird H16; in case the Pellets are not eaten put a little bit juice on it, avoid making a slurry)	80 g
		Oil palm fruits	8 pcs
		<i>Mix oil palm fruits and figs in one bowl</i>	
		Figs (fresh)	5 pcs
8:00 – 13:00	Day 1	Watermelon (cut 1 by 4)	1 pcs
	Day 2	Papaya (cut 1 by 2, bigger ones 1 by 4)	30 g
	Day 3	Muskmelon (cut 1 by 4, leave seeds in)	5 pcs
	Day 4	Watermelon (cut 1 by 4)	8 pcs
	Day 5	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
	Day 6	Muskmelon (cut 1 by 4, let seeds in)	30 g
	Day 7	Papaya (cut 1 by 2, bigger ones 1 by 4)	2 halves
13:00 – 18:00		Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	80 g
		Cherry tomatoes	3 pcs

*(25% mealworms, 25% superworms, 25% cockroaches, 25% crickets)

Diet in the wild

The writhed hornbill mainly feeds on large fruit with figs making up the majority of its diet. It consumes more drupaceous fruits than other hornbill species.

Special characteristic

It also occasionally eats small animals like insects, crabs, snails and reptiles, particularly during the breeding season.

Toucans & Aracarís

Order Piciformes

TENTATIVE DIET PLAN

Ariel Toucan

(*Ramphastos vitellinus ariel*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellet T 20 (if not eaten, put a little bit fruit juice on it)	50 g
8:00 – 18:00	Day 1	Watermelon (cut 1 by 4)	1 pcs
	Day 2	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
	Day 3	Muskmelon (cut 1 by 4, let seeds in)	2 pcs
	Day 4	Watermelon (cut 1 by 4)	1 pcs
	Day 5	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
	Day 6	Muskmelon (cut 1 by 4, let seeds in)	2 pcs
	Day 7	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
8:00 – 13:00		Vegetable/Fruit mix* (20% papaya, 20% apples, 20% Muskmelon, 20% cucumber, 20% cherry tomato – whole)	80 g
13:00 – 18:00		Mix: 25% chickpeas (sprouted), 25% paneer (cut 1 x 1 cm), 25% crickets, 25% Carrot (steamed, 1 cm slices, cut 1 by 4)	40 g
		<i>Seasonal fruits (one out of it):</i>	
		Jamun (in total)	1 pcs
		Fig (cut 1 by 2)	1 pcs
		Cherries (in total)	3 pcs
		Gooseberry (cut 1 by 2)	1 pcs
		Grapes (in total)	5 pcs
		Pinkies (Monday, Friday)	1 pcs
		– alternative: Chicken heart (cut 1 by 4)	4 pcs

Diet in the wild

Toucans are frugivorous birds, whose primary diet is fruit. In the wild they consume fruits from as many as 100 species of plants and trees.

Special characteristic

They also consume a variety of insects and eggs for protein, especially during their nesting cycle.

TENTATIVE DIET PLAN

Yellow-throated Toucan

(Ramphastos ambiguus)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellet T 20 (if not eaten, put a little bit fruit juice on it)	50 g
8:00 – 18:00	Day 1	Watermelon (cut 1 by 4)	1 pcs
	Day 2	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
	Day 3	Muskmelon (cut 1 by 4, let seeds in)	2 pcs
	Day 4	Watermelon (cut 1 by 4)	1 pcs
	Day 5	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
	Day 6	Muskmelon (cut 1 by 4, let seeds in)	2 pcs
	Day 7	Papaya (cut 1 by 2, bigger ones 1 by 4)	1 pcs
8:00 – 13:00		Vegetable/Fruit mix* (20% papaya, 20% apples, 20% Muskmelon, 20% cucumber, 20% cherry tomato – whole)	80 g
13:00 – 18:00		Mix: 25% chickpeas (sprouted), 25% paneer (cut 1 x 1 cm), 25% crickets, 25% Carrot (steamed, 1 cm slices, cut 1 by 4)	40 g
		<i>Seasonal fruits (one out of it):</i>	
		Jamun (in total)	1 pcs
		Fig (cut 1 by 2)	1 pcs
		Cherries (in total)	3 pcs
		Gooseberry (cut 1 by 2)	1 pcs
		Grapes (in total)	5 pcs
		Pinkies (Monday, Friday)	1 pcs
		– alternative: Chicken heart (cut 1 by 4)	4 pcs

Diet in the wild

Yellow-throated toucans are herbivorous (frugivorous) birds that feed mainly on a wide range of fruit but may also eat insects, eggs, nestlings, and lizards.

Special characteristic

Prone to iron storage disease (haemochromatosis); vitamin C (ascorbic acid, e.g. in citrus fruits) and sugar increase the storage of iron.

TENTATIVE DIET PLAN

Black-necked Aracari

(*Pteroglossus aracari*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga T 20, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insect Mix (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
	Quail egg (boiled)*	1 pcs

Diet in the wild

They are opportunistic omnivores, with the main components of their diet being fruit, berries, and arthropods.

Special characteristic

Aracaris are arboreal and feed mainly in the forest canopy; they also take eggs and nestlings of other birds.

TENTATIVE DIET PLAN

Curl-crested Aracari

(*Pteroglossus beauharnaesii*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga T 20, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Oil palm fruits	3 pcs
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
	Quail egg (boiled)*	1 pcs

*Take it out when it is not eaten

Diet in the wild

The curl-crested aracari's diet mainly consists of fruits, and it also consumes insects, eggs, and small vertebrates.

Special characteristic

This varied diet is crucial in seed dispersal within its habitat, aiding forest regeneration.

Perching Birds

Order Passeriformes

CROWS & MAGPIE-JAYS

TENTATIVE DIET PLAN

American Crow

(*Corvus brachyrhynchos*)

INDICATIVE TIME	DAY	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00		Pellets (dry dog food)	20 g
8:00 – 12:00		Boiled mix (30% boiled Pumpkin, 20% boiled Carrot, 30% boiled Sweet potatoes, 20% boiled chickpeas)	20 g
		Fruit mix (20% papaya, 20% banana, 20% sapodilla, 20% muskmelon, 10% apple, 10% guava)	20 g
15:00 – 18:00	Day 1	Vegetable mix (20% lettuce, 20% green peas, 20% cucumber, 20% bell peppers red, 20% zucchini yellow)	30 g
	Day 2	Paneer (cubes of 1 x 1 cm)	20 g
	Day 3	Pinkies (small)	2 pcs
	Day 4	Insect mix (mealworms, superworms, cockroaches, crickets)	20 g
	Day 5	Egg (egg white and egg yolk with shell)	1 pcs
	Day 6	Insect mix (mealworms, superworms, cockroaches, crickets)	20 g
	Day 7	Buffalo heart (cut 1 x 1 cm)	2 pcs

Diet in the wild

American crows are omnivorous, meaning that they eat food of both plant and animal origin.

Special characteristic

During spring and summer seasons they feed upon worms, larvae, and insects as well as corn, fruits, and nuts. In autumn and winter, they eat acorns, nuts, and walnuts.

TENTATIVE DIET PLAN

White-throated Magpie-jay

(*Calocitta formosa*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	40 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

White-throated magpie-jays are omnivorous, with a varied diet that includes insects, small reptiles, rodents, and birds' eggs. They also consume fruits and seeds, particularly during the non-breeding season.

Special characteristic

These birds often forage on the ground, using their strong bills to probe for food.

Enrichment

Offer a shallow dish with sand, place the insects on it and cover them with dry leaves.

FAIRY-BLUEBIRDS

TENTATIVE DIET PLAN

Asian Fairy Bluebird

(Irena puella)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	25 g
	Insects (mealworms, maggots, crickets)	6 pcs (2 in each)
	<i>Offer both items in one bowl.</i>	
	Papaya (cut 1 by 8)	1 pcs
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
	Fig (fresh, cut 1 by 2)	1 half fig
13:00 – 18:00	Fruit/veg mix (cutting size 1 x 1 cm) (25% papaya, 25% cucumber, 25% muskmelon, 25% apple)	30 g
	Fig (fresh, cut 1 by 2)	1 half fig

Diet in the wild

The diet of the Asian fairy-bluebird primarily consists of fruits, particularly figs, which comprise a large portion of their intake. They also consume various other fruits, nectar, and some insects, adapting their feeding habits to the availability of food sources in their environment.

Special characteristic

The bird's strong beak is well-suited to its frugivorous diet, allowing it to peel and consume fruit easily.

ORIOLES

TENTATIVE DIET PLAN

Black-and-crimson Oriole

(*Oriolus cruentus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga Uni komplet)	30 g
	Insect Mix (25% mealworms, 25% maggots, 25% cockroaches, 25% crickets)	20 g
	<i>You can mix the Pellets with the insects in one bowl.</i>	
8:00 – 13:00	Soft food (insectivore)	30 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
	+ fresh fig (cut 1 by 2)	a half fig

Diet in the wild

They are opportunistic omnivores, with the main components of their diet being fruit, berries, and arthropods.

Special characteristic

Orioles are arboreal and tend to feed in the canopy.

TENTATIVE DIET PLAN

Dark-throated Oriole

(*Oriolus xanthonotus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga Uni komplet)	30 g
	Insect Mix (25% mealworms, 25% maggots, 25% cockroaches, 25% crickets)	20 g
	<i>Pellets with the insects in one bowl.</i>	
8:00 – 13:00	Soft food (insectivore)	30 g
	Papaya (cut 1 by 8)	1 pcs
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava) + fresh fig (cut 1 by 2)	30 g

Diet in the wild

The dark-throated oriole is an omnivorous bird with a diet of fruit, berries, arthropods, and nectar.

Special characteristic

They have been noted to take nectar from large flowers and can sometimes be nest predators on smaller birds.

FIGBIRDS

TENTATIVE DIET PLAN

Yellow Figbird

(Sphecotheres flaviventris)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni complete)	20 g
	Insects (mealworms, maggots, waxworm, crickets, ant eggs)	5 g
	Papaya (cut 1 by 8)	1 pcs
	Muskmelon (cut 1 by 8)	1 pcs
8:00 – 13:00	Soft food (insectivore)	30 g
	Fig (fresh, cut 1 by 2)	½ pcs
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (20% papaya, 20% Muskmelon, 20% Dragonfruit, 20% green grapes, 20% Watermelon) Fig (fresh, cut 1 by 2)	30 g

Diet in the wild

Figs are a particularly popular food item (as suggested by their common name), although they will feed on most soft fruits and native berries in canopy trees.

Special characteristic

They consume insects too. They also have been known to eat nectar and seeds.

DRONGOS

TENTATIVE DIET PLAN

Ashy Drongo

(*Dicrurus leucophaeus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

As predominantly insectivorous birds, ashy drongos primarily feed on insects such as grasshoppers, cicadas, flying ants, and other small creatures.

Special characteristic

Exceptionally agile in flight, they often display impressive aerobatic skills while hunting their prey mid-air.

GONOLEKS

TENTATIVE DIET PLAN

Yellow-crowned Gonolek

(*Laniarius barbarus*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete)	10 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	25 g
13:00 – 18:00	Soft food (insectivore)	25 g

Diet in the wild

The yellow-crowned gonolek feeds mainly on large insects such as grasshoppers and crickets, and on worms.

Special characteristic

Additionally, it also consumes fruits, seeds, and nectar, making it an opportunistic feeder.

BUTCHERBIRDS & MAGPIES

TENTATIVE DIET PLAN

Black Butcherbird

(*Cracticus quoyi*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Dog food, dry)	30 g
	Insects (25% mealworms, 25% superworms, 25% cockroaches, 25% crickets)	20 g
	<i>You can mix the Pellets with the insects in one bowl.</i>	
8:00 – 13:00	Buffalo meat (grated 1 x 2 cm, form like a "worm")	20 g
	Chicken neck	1 pcs
13:00 – 18:00	Mice (cut 1 by 2)	4 mice
	Chicken heart (cut 1 by 4)	1 heart

Diet in the wild

Butcherbirds are primarily carnivorous. Their main food source consists of insects and small vertebrates, such as lizards and small birds.

Special characteristic

They have a unique hunting technique of impaling their prey on thorns or barbed wire to save them for later consumption.

TENTATIVE DIET PLAN

Australian Magpie

(*Gymnorhina tibicen*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	40 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

The Australian magpie is omnivorous and is essentially a butcherbird that forages on the ground. They feast upon invertebrates like snails, spiders, earthworms, millipedes, scorpions, and insects including beetles, moths, caterpillars, cockroaches, ants, and larvae.

Special characteristic

They are able to capture insects like grasshoppers' midair. They also consume bigger animals like frogs, skinks, mice, etc.

Enrichment

Offer a shallow dish with sand, place the insects on it and cover them with dry leaves.

MYNAS & STARLINGS

TENTATIVE DIET PLAN

Dumont's Mynah

(Mino dumontii)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga T20, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insect Mix (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Soft food (insectivore)	30 g

Diet in the wild

Preferred food items in the wild include fruits, a variety of insects, and small reptiles and amphibians.

Special characteristic

In captivity, a low-iron pelleted diet to prevent iron storage disease (≤ 80 ppm iron) is needed. Fruits high in vitamin C should be avoided, because these facilitate iron absorption.

TENTATIVE DIET PLAN

Coletto Mynah

(Sarcops calvus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga T20, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insect Mix (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	40 g
13:00 – 18:00	Soft food (insectivore)	30 g

Diet in the wild

Preferred food items in the wild include fruits, a variety of insects, and small reptiles and amphibians.

Special characteristic

In captivity, a low-iron pelleted diet to prevent iron storage disease (≤ 80 ppm iron) is needed. Fruits high in vitamin C should be avoided, because these facilitate iron absorption.

TENTATIVE DIET PLAN

Chestnut-bellied Starling

(*Lamprotornis pulcher*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insect Mix (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	40 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

The chestnut-bellied starling is omnivorous, feeding mainly on insects such as termites, ants and beetles, as well as other invertebrates, fruits, berries and seeds.

Special characteristic

These birds often forage on the ground, using their strong bills to probe for food.

Enrichment

Offer a shallow dish with sand, place the insects on it and cover them with dry leaves.

FINCHES

TENTATIVE DIET PLAN

Bengali Finch

(*Lonchura striata domestica*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (finch)	5 g
	Pellet (Versele Laga nutribird C19)	5 g
	Insect Mix (ant eggs, mealworm small)	5 pcs/2 pcs
8:00 – 13:00	Soft food (soft eater)	10 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	10 g

Diet in the wild

Their favourite foods consist of millet, egg food, sprouted seed, small mealworms, termites, and ant pupae.

Special characteristic

As for water, you should offer fresh dishes of water every day. There should be one water source for bathing and one for drinking.

TENTATIVE DIET PLAN

Australian Zebra Finch

(*Taeniopygia guttata castanotis*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Seed mix (finch)	5 g
	Pellet (Versele Laga nutribird C19)	5 g
	Insect mix (ant eggs, mealworm small)	5 pcs / 2 pcs
8:00 – 13:00	Soft food (soft eater)	10 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	10 g

Diet in the wild

Zebra finches feed in large flocks on fallen or ripening grass seeds. Insects may be taken at any time of the year, but are particularly favoured when feeding young.

Special characteristic

Feeding takes place on the ground, and, unlike some other grassfinches, birds never pull seed heads down with their feet.

TANAGERS

TENTATIVE DIET PLAN

Bay-headed Tanager

(Tangara gyrola)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni komplet)	5 g
	Insects (maggots, ant eggs)	5 g
	Soft food (insectivore)	10 g
	Nectar (Lory nectar powder, use fruit juice instead of water and add ground Pollen)	10 ml
8:00 – 13:00	Hibiscus flowers	2 pcs
13:00 – 18:00	Papaya (cut 1 by 8)	1 pcs
	Banana (with skin, cut in half lengthwise, then cut across)	1 pcs
	Dragon fruit (cut 1 by 8)	1 pcs
	Grapes (cut 1 by 2)	2 pcs
	Soft food (insectivore)	10 g
	Nectar (Lory nectar powder, use fruit juice instead of water and add ground Pollen)	10 ml
	Hibiscus flowers	2 pcs
	Papaya (cut 1 by 8)	1 pcs
	Banana (with skin, cut in half lengthwise, then cut across)	1 pcs
	Watermelon (cut 1 by 8)	1 pcs
	Grapes (cut 1 by 2)	2 pcs
	Muskmelon (cut 1 by 8)	1 pcs

Diet in the wild

Their primary diet consists of fruit (often swallowed whole).

Special characteristic

They will also take nectar, seeds and insects, often picked from the underside of branches.

CARDINALS

TENTATIVE DIET PLAN

Yellow Cardinal

(*Gubernatrix cristata*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete)	25 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Soft food (insectivore)	25 g

Diet in the wild

Yellow cardinals have a diverse diet that primarily consists of seeds, fruits, and insects.

Special characteristic

Hatched nestlings are mainly fed with insects.

BELLBIRDS & FRUITCROWS

TENTATIVE DIET PLAN

Bearded Bellbird

(*Procnias averano*)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insect Mix (mealworms, silkworms, crickets)	6 pcs (2 of each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	40 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

The bearded bellbird is a fruiteater with a wide mouth (gape) that enables it to swallow large berries. In the wild they feed almost entirely on fruit and berries, mainly plucking them while on the wing; in captivity, insects and egg are added as extra protein.

Special characteristic

Unlike most songbirds, which raise their young on caterpillars and insects, the female bellbird feeds her chick a diet of regurgitated berries.

TENTATIVE DIET PLAN

Bare-necked Fruitcrow

(Gymnoderus foetidus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellet (Versele Laga Uni komplet)	30 g
	Insect mix (25% Mealworms, 25% Superworms, 25% Cockroaches, 25% Crickets)	20 g
	<i>You can mix the Pellets with the insects in one bowl.</i>	
8:00 – 13:00	Soft food (insectivore)	20 g
13:00 – 18:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
	+ fresh fig (cut 1 by 2)	

Diet in the wild

Diet consists mainly of fruits and berries, although some insects and small vertebrates are also consumed.

Special characteristic

Fruit crows usually feed in a manner typical of many cotingids — by seizing their food, both fruits and insects, in flight; but they regularly perch to pluck fruits.

BLACKBIRDS

TENTATIVE DIET PLAN

Yellow-hooded Blackbird

(Chrysomus icterocephalus)

INDICATIVE TIME	ITEM	DAILY AMOUNT (DATA PER ANIMAL)
8:00 – 18:00	Pellets (Versele Laga Nutribird Uni Complete, if not eaten, put a little bit fruit juice on it, but avoid making a slurry)	30 g
	Insects (mealworms, silkworms, crickets)	6 pcs (2 in each)
8:00 – 13:00	Fruit mix (cutting size 1 x 1 cm) (25% papaya, 25% apples, 25% Muskmelon, 25% guava)	30 g
13:00 – 18:00	Soft food (insectivore)	30 g
	Quail egg (boiled)	1 pcs

Diet in the wild

Yellow-hooded blackbirds have a diet consisting of insects and seeds. On average, around sixty-six per cent of their diet consists of seeds, which includes grass, weed, and waste seeds.

Special characteristic

When there is increased availability in the summer, they feed largely on beetles, caterpillars, grasshoppers, ants, wasps, and other invertebrates.

CHAPTER

12

Reptiles

Class Reptilia

Turtles & Tortoises

Order Testudines

Lizards

Order Squamata

Snakes

Order Squamata

Crocodilians

Order Crocodylia

Turtles & Tortoises

Order Testudines

TENTATIVE DIET PLAN

Pink-bellied Short-necked Turtle

(*Emydura subglobosa*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Alternate day	Mixed fruits: Papaya, Apple, Blueberries, Banana, Fig Mixed Vegetables: Romaine lettuce, Water lettuce or Water hyacinth Protein: River shrimp, Tilapia fillets, Chicken liver or Turtle Pellets	10% of body weight in summers and 8% of body weight in winters.

TENTATIVE DIET PLAN

Assam Leaf Turtle

(*Cyclemys gemeli*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Chicken heart, Freshwater shrimp Fuzzy mice once a week Tilapia fish, twice a week Pumpkin once a month Hikari turtle Pellets twice a month Crickets once a month	10% of body weight in summers and 8% of body weight in winters.

TENTATIVE DIET PLAN

Indian Flapshell Turtle

(*Lissemys punctata*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Thrice a week	Fresh cut Chicken or River shrimp or Chicken liver	10% of body weight in summers and 8% of body weight in winters.

TENTATIVE DIET PLAN

Pancake Tortoise

(*Malacochersus tornieri*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Thrice a week	Mixed leaves Moringa leaves 15% Hibiscus leaves and flowers 20% Mulberry leaves 5% Romaine lettuce 15% Opuntia cactus 15% Alfalfa 15% Mustard greens 5% Timothy grass 10% Boiled egg with shell (mashed) – occasionally only, as a calcium and protein supplement *Apple *Blueberries	10% of body weight in summers and 8% of body weight in winters.

TENTATIVE DIET PLAN

Indian Roofed Turtle

(*Pangshura tecta*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Daily	Mixed leaves (Mulberry leaves, gongura, hibiscus, Amaranth, romaine) Whole River shrimp / Whole fish small	10% of body weight in summers and 8% of body weight in winters.

Lizards

Order Squamata

TENTATIVE DIET PLAN

Philippine Sailfin Lizard

(*Hydrosaurus pustulatus*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Daily	Amaranth leaves 15% Hibiscus leaves 15% Fenugreek leaves 15% Moringa leaves 15% Romaine lettuce 15% Grated Carrot 5% Iceberg lettuce 5% Mulberry leaves 5% Coriander leaves 5% Hibiscus flowers 5% Mice pinkies	10% of body weight in summers and 8% of body weight in winters.

TENTATIVE DIET PLAN

Frilled Lizard

(*Chlamydosaurus kingii*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Cockroaches / Crickets	2-3 insects per animal

TENTATIVE DIET PLAN

Guyana Caiman Lizard

(*Dracaena guianensis*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Snails / Fish fillet / Chicken / Beef	30–50 g per animal

TENTATIVE DIET PLAN

Chinese Crocodile Lizard

(Shinisaurus crocodilurus)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Earthworms / Snail	2 - 3 per animal

TENTATIVE DIET PLAN

Tokay Gecko

(Gekko gekko)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Crickets/Mealworms/BSF	2-3 insects per animal

TENTATIVE DIET PLAN

Leopard Gecko

(Eublepharis macularius)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Crickets/BSF/ mealworm	2-3 insects per animal

TENTATIVE DIET PLAN

Veiled Chameleon

(Chamaeleo calypttratus)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Crickets/BSF/ silkworm	2-3 insects per animal

TENTATIVE DIET PLAN

Central Bearded Dragon

(*Pogona vitticeps*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Every alternate day	Crickets/BSF/ mixed greens	2-3 insects/ 10 g per animal

TENTATIVE DIET PLAN

Cuming's Water Monitor

(*Varanus cumingi*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once / Twice a week	Quail/Fish/Chicken/ Beef/Rats/Rabbit	50 g pieces / 3 mice each

TENTATIVE DIET PLAN

Asian Water Monitor

(*Varanus salvator*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once / Twice a week	Quail/Fish/Chicken/ Beef/Rats/Rabbit	50–250 g pieces / 2–4 pcs

Snakes

Order Squamata

TENTATIVE DIET PLAN

Indian Cobra

(*Naja naja*)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once a week	Pinky/Mice/Rat	2 per animal

TENTATIVE DIET PLAN

California Kingsnake

(Lampropeltis californiae)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once a week	Pinky/Mice/Rat	2 per animal

TENTATIVE DIET PLAN

Species Names

Short-nosed Vine Snake	Drapiez's Cat Snake	Dog-toothed Cat Snake	Brown Cat Snake
Many-spotted Cat Snake	Black-headed Cat Snake	Black Copper Rat Snake	Red-tailed Indigo Snake
Taiwan Beauty Snake	Jansen's Rat Snake	Andean Milk Snake	Brooks's Kingsnake
Central American Milk Snake	Sinaloan Milk Snake	Viperine Water Snake	Grass Snake
Eight-striped Kukri Snake	Brown Kukri Snake	Eastern Rat Snake	Texas Rat Snake
Eastern Fox Snake	Indian Rat Snake	Mexican Garter Snake	Red-sided Garter Snake

ITEMS	FEED FREQUENCY	DAILY AMOUNT
Rodents	Once per week	2 per animal

TENTATIVE DIET PLAN

Boa Constrictor

(Boa constrictor)

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once a week	Pinky/Mice/Rat	2 per animal

Crocodylians

Order Crocodylia

TENTATIVE DIET PLAN

Small Crocodiles

FEED FREQUENCY	FEED INGREDIENTS	QTY/DAY/INDIVIDUAL
Once a week	Buffalo meat/fish/chicken	500 g – 1.5 kg / week

TENTATIVE DIET PLAN

Large Crocodiles

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once a week	Buffalo meat/fish/chicken	2–3 kg / week

TENTATIVE DIET PLAN

Gharials

FEED FREQUENCY	FEED INGREDIENTS	DAILY AMOUNT (DATA PER ANIMAL)
Once a week	Fish	1.5–2 kg / week

A					
Abyssinian Ground-hornbill	160	Bar-shouldered Dove	127	Double-spurred Spurfowl	119
African Brush-tailed Porcupine	72	Barbary Dove	130	Drapiez's Cat Snake	186
African Civet	100	Bare-necked Fruitcrow	179	Dumont's Mynah	174
African Darter	150	Barn Owl	146	E	
African Fish Eagle	139	Barred Cuckoo Dove	131	Eastern Fox Snake	186
African Hawk-eagle	138	Bay-headed Tanager	177	Eastern Rat Snake	186
African Jacana	159	Bearded Bellbird	178	Eight-striped Kukri Snake	186
African Sacred Ibis	153	Beautiful Fruit Dove	128	F	
African Spoonbill	154	Bengali Finch	176	Four-horned Antelope	105
African Wild Dog	88	Biak Lorikeet	136	Friiled Lizard	183
African Wildcat	87	Binturong	101	G	
African Wood Owl	147	Black Butcherbird	172	Gharials	187
Alexandrine Parakeet	135	Black Copper Rat Snake	186	Grass Snake	186
American Bison	106	Black Hawk-eagle	141	Great White Pelican	149
American Black Bear	91	Black-and-crimson Oriole	169	Greater Hog Badger	97
American Crow	166	Black-and-white-casqued Hornbill	161	Greater One-horned Rhinoceros	111
American Flamingo	155	Black-capped Parakeet	133	Grey Peacock Pheasant	119
American White Ibis	152	Black-headed Cat Snake	186	Grey-breasted Partridge	120
Amur Leopard	86	Black-necked Aracari	165	Guyana Caiman Lizard	183
Andean Goose	117	Black-rumped Agouti	77	Gyr Falcon	142
Andean Milk Snake	186	Blue Crane	158	I	
Arabian Partridge	121	Boa Constrictor	186	Indian Cobra	185
Arabian Wolf	89	Brooks's Kingsnake	186	Indian Crested Porcupine	69
Arctic Fox	90	Brown Cat Snake	186	Indian Flapshell Turtle	181
Ariel Toucan	163	Brown Hyena	103	Indian Rat Snake	186
Ashy Drongo	171	Brown Kukri Snake	186	Indian Roofed Turtle	182
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Ashy-headed Goose	117	Caatinga Parakeet	134	Jansen's Rat Snake	186
Asian Badger	96	California Kingsnake	186	K	
Asian Elephant	114	Central American Milk Snake	186	Kalij Pheasant	118
Asian Fairy Bluebird	168	Central Bearded Dragon	185	L	
Asian Small-clawed Otter	96	Chacoan Mara	76	Laotian Rock Rat	80
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Asiatic Black Bear	92	Chinese Crocodile Lizard	184	Leopard	85
Asiatic Lion	82	Citron-crested Cockatoo	137	Leopard Gecko	184
Assam Leaf Turtle	181	Coletto Mynah	174	Lesser Capybara	73
Austral Parakeet	135	Common Bronze-winged Pigeon	123	Lion	83
Australian King Parrot	132	Common Genet	101	Long-tailed Chinchilla	79
Australian Magpie	173	Common Hamster	79	Lowland Paca	78
Australian Pelican	149	Crested Caracara	144	Lowland Tapir	110
Australian Shelduck	118	Crested Porcupine	71	M	
Australian Zebra Finch	176	Cuming's Water Monitor	185	Malayan Porcupine	70
Azure-rumped Parrot	133	Curl-crested Aracari	165	Many-spotted Cat Snake	186
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Bald Eagle	140	Dark-throated Oriole	169		
Band-tailed Pigeon	122	Demoiselle Crane	156		
Banded Fruit Dove	129	Dog-toothed Cat Snake	186		
Banded Mongoose	102	Domesticated Guinea Pig	76		
Bar-headed Goose	116				

Marsh Owl	148
Mexican Agouti	77
Mexican Garter Snake	186

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Pancake Tortoise	182
Patagonian Mara	75
Philippine Sailfin Lizard	183
Pink-bellied Short-necked	181
Turtle	
Plains Zebra	113
Polecat	98
Pygmy Falcon	143

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Rabbit	80
Raccoon	104
Red River Hog	107
Red-rumped Agouti	77
Red-sided Garter Snake	186
Red-tailed Indigo Snake	186
Rock Cavy	74

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Sambar Deer	109
Sarus Crane	157
Short-nosed Vine Snake	186
Silver Fox	90
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Sloth Bear	93
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Southern Giraffe	106
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Striped Skunk	100
Sugar Glider	81
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Swamp Deer / Barasingha	108

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Taiwan Beauty Snake	186
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Every Life Matters

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