

SANJEEVANI

LSeT INSTITUTE OF ANIMAL CARE & MANAGEMENT

EDUCATION | CONSERVATION

ETHICS

EARTH & RESPECT FOR ITS INHABITANTS

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& conservation Pg: 52

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Purple-bellied Lory.
Photo Simon Degenhard

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From the Editor

Dear Readers,

It gives us immense pleasure to present the latest edition of our magazine, now reimagined and renamed **Sanjeevani**—a name that reflects life, care, and healing, values that lie at the very heart of our mission at the Life Science Education Trust.

After a long and unavoidable pause, we are delighted to resume this publication, stronger and more inspired than ever. The interval has allowed us to reflect, evolve, and return with renewed commitment to our goals of knowledge-sharing, community-building, and celebrating the vibrant world of animal care.

This edition is particularly special as it marks the beginning of a new chapter—with fresh ideas, new faces, and an enriched sense of purpose. We extend a heartfelt welcome to the new members of our team whose enthusiasm and energy have already begun to make a positive impact. Together, we look forward to creating more engaging and informative issues in the future.

We are deeply grateful to all the contributors who poured their time, experience, and passion into writing for this issue. From field stories and research insights to practical advice and personal journeys, each article is a reflection of their dedication to the field of animal welfare and management.

We also take this opportunity to warmly welcome our new batch of students to the Institute. Your journey in this noble profession begins now, and we are excited to witness your growth, discoveries, and contributions to the world of animal care.

We hope this edition of **Sanjeevani** both informs and inspires—and serves as a meaningful resource for our readers across the institute and beyond. May this be the first of many more vibrant issues to come.

Happy reading!

Warmly,

TaranJeet Singh

Editor-in-Chief, Sanjeevani
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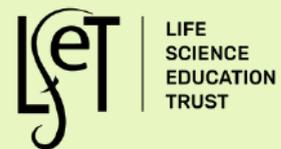
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Tigers

Don't Eat

Meat



Author and photos
Douglas Richardson
Zoological consultant

Introduction

It is frequently stated that knowledge of a species' habits in its wild state should guide us in how we maintain it in captivity (Hediger, 1950). There are still many species kept in zoos about whom we know little of their wild ecology and behaviour, but even for those where we do have a reasonable understanding of their needs, such an obvious maxim is often ignored, and how an animal is kept and fed regularly bears little resemblance to its life in the wild.

The Wildlife Conservation Society's (WCS) Bronx Zoo in New York has one of the finest facilities for gorillas that aims to mimic their wild habitat and natural social structure and has breeding records to match, but this was not always the case.

When I worked there in the late 1970s, the gorillas were maintained in the Ape House, which opened in 1950 but with a larger modified interior created in the early 1970s, which sought to replicate the rainforest. The most important change was to move away from keeping pairs of gorillas to having a group, and they even attempted, unsuccessfully, to have more than one adult male in the troop, as would sometimes be the case in the wild.

Even though they recognised that these were social animals, when a female was in the latter part of her pregnancy, she was kept separate from the others so as not to 'endanger' the baby.

The Bronx Zoo was not alone in this practice at the time, but what made it more ironic for them was that the noted field biologist George Schaller was a member of the Society's staff, and his groundbreaking study of the Mountain Gorilla had been published over ten years previously in 1963 (Schaller, 1963).

Needless to say, this overly protective, socially abnormal approach to the management of a pregnant gorilla usually resulted in the need to hand-rear the baby. Gorilla births were still rare at the time, and it was a few more years before socially adept offspring were routinely reared in zoos within their natal groups.

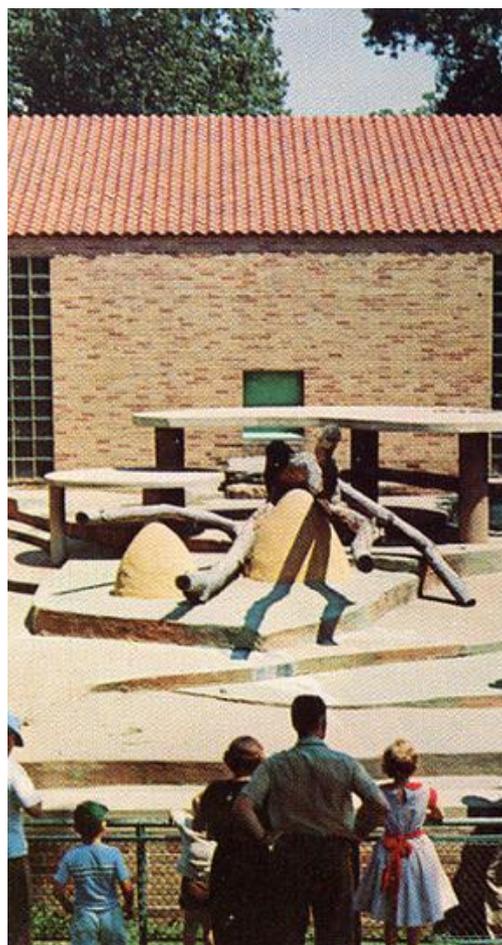
As important as ensuring the correct species-appropriate social grouping is ensuring that your animals are fed a diet that is both nutritionally sound and presented in such a way as to allow for proper feeding behaviour.

Many Western zoos pay too much attention to the former and not enough to the latter by providing a diet that meets all the animal's nutritional needs but ignores the nature of the food it has evolved to deal with. This type of approach is most often applied to obligate carnivores like felids.

**Lions, tigers,
leopards and Rusty-
spotted Cats do not
eat meat – they eat
animals!**

This blatantly obvious fact is more often than not ignored by zoos when formulating diets for big and small cats. In many North American zoos, they have for many years been feeding formulated minced meat diets to all their cats (Shoemaker et al., 2003), which maintains the animals in good health generally but takes all the 'fun' out of what should be the highlight of the animal's day.

I have seen an adult Amur Tiger virtually inhale a 4 kg block of such a processed diet in seconds. Although these products contain the correct ratios of proteins, vitamins and minerals, they lack any sort of density or substance that helps maintain jaw muscle integrity and teeth in good condition, which results in having to subject the animal to an annual anaesthesia and attention from a dentist to remove excess tartar.



In Europe and Asia, zoo cats are normally fed joints of actual domestic ungulate meat on the bone, which provides the animal with a meal that takes some time to process, is more natural and is tough enough and abrasive enough to ensure good oral health.

Just feeding muscle meat on the bone will often result in an inappropriate calcium-to-phosphorus ratio, and this is covered by sprinkling a suitable powdered vitamin and mineral supplement onto the meat, often with a dash of suitable fish oil.

Such a diet is more enriching for the cats, but it still falls short of a truly natural diet, not least because the cat does not have the opportunity to process an entire carcass: a buffalo or a goat for a large cat; a rabbit or chicken for a smaller felid. Dealing with hair or feathers, skin, internal organs, sinew, and muscle are all part of a wild cat's feeding behaviour, and for the larger species of felids, the size and frequency of the meal can be as important (Law et al., 1997).

The larger felids, by their nature, prey on larger species. This allows them to gorge on a large meal over one or two days and rest for a couple of days before needing to feed again. This ability to actually fill their



Tiger and deer leg

stomach appears to also greatly reduce the incidence of stereotyped pacing (Jeschke, 2007). However, introducing such a feeding regime may mean a complete change in how the animals are managed.

- A large meal is not something that can necessarily be consumed in one night.
- Having to feed all animals separately is not always appropriate.
- Locking animals into a secure indoor den every night from closing time until the next morning is not good practice and is contra-indicated from a welfare point of view.
- Animals can be easily conditioned or trained to come into a management area at any time of the day or night, as required, and it is not necessary to always feed them indoors to achieve this level of control.
- All remaining food does not need to be removed every day for cleanliness and animal health reasons, especially if they are fed in the main enclosure and not in some small feeding den.

Wild felids, especially the larger species, are amongst the best studied in the field, so we know quite a bit about the key aspects of their life in the wild.

Some zoos have managed these species along the lines of what I am recommending for many years, and the health of the animals is not compromised, and their welfare is significantly enhanced.

We can be concerned about stereotypic behaviour in our animals, but we often fail to notice how our husbandry regimes may be the cause of such behaviour.

Many people in zoos compartmentalise the care of their animals and view housing, group composition, feeding, breeding and enrichment as separate parts of a husbandry regime when they should all be viewed holistically.

A few years ago, I gave a presentation at an international enrichment conference entitled, 'Is the need for enrichment indicative of poor welfare?' (Richardson, 2016), my premise being that if more enrichment was required, it was a sign that the husbandry was lacking.

The provision of enrichment for felids in zoos is usually to compensate for their lack of an opportunity to stalk, kill and consume appropriate prey.

The provision of whole carcasses of an adequate size, at an appropriate frequency and in a suitable way will enhance the health and welfare of your lions and leopards.

Feeding zoo ungulates to zoo carnivores is an ideal approach, but it is also a subject for another article.





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Parrots are attentive to the signals around them, especially if they come from their keeper



Animal Training

A Key Tool for **Welfare, Husbandry and Reintroduction Projects**



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There are many areas involved in achieving appropriate welfare for animals living in human care. Accredited zoos, such as Loro Parque, have professionals from different areas who work together to achieve this. One such group is the trainers.

The European Association of Zoos and Aquaria (EAZA) recognises science-based animal training as an indispensable part of animal care. The training of animals under human care has numerous benefits: cooperation when administering medical care, providing valuable scientific information, increasing the safety of keepers and many more that have made animal training a highly relevant aspect of accredited wildlife centres and modern aquariums.

For example, from a medical perspective, training is a great tool to teach animals to assist in veterinary interventions and routine check-ups, such as administering injections, drawing blood, dressing wounds,

or simply getting them into a carrier. In this way, procedures are developed that are comfortable for the animal, making the work of keepers and veterinarians easier.

In the case of breeding centres, the application of training is based on a concept of communication and reward with the animals. A good example is when we offer a preferred food/treat in the morning at the opposite end of the aviary to where the nesting facilities are located, thereby encouraging the incubating or brooding female to move away from the nest to allow for stress-free nest inspection.

If this is done calmly and repeatedly, many birds learn this simple training, which facilitates inspections and handling of eggs and/or chicks and encourages communication between the keeper and the breeding pair.





A Vinaceous Amazon being trained on swinging perches to develop skills specific to the wild

Training also contributes to the work of researchers. Animals that are the subject of research projects are trained to perform the relevant behaviours, allowing the researcher/s to obtain the necessary information in an optimal way.

But beyond its contribution in these areas, training itself is a fundamental element in the general welfare of animals in human care. It helps the animals to remain psychologically and physically active and to develop various positive behaviours, which are the main aspects for them to reach a comfortable condition.

The development of advanced animal training in zoos makes it possible to also use this powerful tool in rescue, rehabilitation and reintroduction projects for endangered species in the wild.

It allows us, for example, to teach animals to identify predators or to identify appropriate natural food sources that will assist them to survive in the wild.

Hence, it is important to know the species very well, both under human care and in the wild, to allow for the control of a greater number of parameters.

This is one of the master keys of Loro Parque Fundación's projects to succeed in the process of adapting captive-bred parrots to the wild for the recovery of their species.

When a breeder understands this concept and applies it within the management of their birds, they quickly realise the benefits. Simple things like talking when entering the facility and always saying the same thing about what you are going to do allow for effective communication with the parrots. And it is not even necessary to speak, just tapping twice on a feeder will suffice. The birds will associate this with the specific activity. When cleaning their aviary, another specific command will alert them to what we are doing, greatly improving the relationship between keeper and bird and leading to better management.



Blue-streaked Lory

Lory and Lorikeet Nutrition

Author
Lubos Tomiška



Photos
Simon Degenhard

Introduction

The feeding of lories and lorikeets is a common topic of discussion among aviculturists. There are as many ways to feed these birds as the number of breeders who keep them. There are also many different commercial foods available for this fascinating and beautiful group of birds.

Such products can vary a lot in quality and composition. As a result, it can become confusing as to what brands of food are the best to use and how to recognise which feeding regimes and methods work best.

Many species of the *Loriidae* family, especially those of the genera *Lorius* and *Trichoglossus*, are hardy and prolific birds. For this reason, they are successfully bred by many breeders despite their methods varying greatly. For example, in literature, there are records documenting the breeding of Rainbow Lorikeets *Trichoglossus moluccanus* that were fed nothing but dry sunflower seed and apples.

While some may see this as a success, we should also consider the long-term impact of such a diet on the health of birds.

This article provides a theoretical background of lory and lorikeet nutrition and offers a few suggestions that might help improve breeding results and the long-term health of your birds.

How Do Lories Differ from Other Parrots?

In comparison to most of the parrot family, which are granivorous (seed-eating), lories and lorikeets are unique because they eat nectar. Several factors enable them to eat a sweet liquid diet. Taking note of their physical appearance, their feathers are smooth and glossy.

Some species, such as the Blue-streaked Lory *Eos reticulata*, Black Lory *Chalcopsitta atra*, and Duyvenbode's Lory *Chalcopsitta duyvenbodei*, have thin, stiff feathers on their head. These traits are adaptations to nectarivory (the ability to eat nectar), as normal feathers would quickly become soiled by the sticky nectar.

Compared to body size, **lories have smaller beaks than other parrots.** A narrow and longer beak shape is a characteristic of all nectarivorous birds (hummingbirds and sunbirds are extreme examples).

This is obvious, especially in smaller species such as the Arfak Lorikeet *Oreopsittacus arfaki* and Purple-crowned Lorikeet *Glossopsitta porphyrocephala*.

If you compare the beak shape between these species and a granivorous parrot species of the same size, for example, a lovebird, the difference is clear.

It has been reported that to cover their daily energy requirements, a single lory/lorikeet must visit a few thousand flowers daily. Therefore, the collecting of nectar must be efficient. To enable this, they possess a long tongue covered in papillae.

The papillae increase the tongue's surface area, helping them take in more nectar. The capillarity between the papillae further accelerates the process. In Stella's Lorikeets, the tongue is so long that they can touch their nostrils with it.

Granivorous parrots possess glands that secrete mucus at the end of the oesophagus, making seeds softer before digestion. In lories/lorikeets, these glands are missing. Likely, the most distinctive characteristic of lories and lorikeets is the atrophy of the ventriculus; the extent of its reduction differs among the species. For example, in *Glossopsitta*, this part of the stomach is greatly reduced.

As mentioned above, lories and lorikeets cannot digest dry seeds. The proventriculus, ventriculus, and their connecting part, zona intermedia, are situated in a vertical line.

This is an adaptation to eating foods that are easy to digest, pass through the body quickly and go out. Only simple nutrients are digested within this process.

Another adaptation is the 'squirting' of the faeces, which prevents them from accumulating around the cloaca.



Wild Diet of Lories and Lorikeets

There are still many things that we do not know when it comes to the natural diet of lories and lorikeets. Despite a considerable number of published studies, none of them has fully answered the question of how these birds digest proteins.

In avicultural books, we often read that they consume nectar as a source of sugars and pollen as a source of proteins. However, such an explanation is not exact. Nectar is just sweet water that attracts pollinators.

More than 99% of the solid part consists of glucose, fructose, and saccharose. The proportion of those three sugars can differ among flowers significantly.

I discovered the above when I went through botanical journals to find out the composition of nectar in Eucalyptus and Banksia, the nectars of which are often consumed by lorikeets in the wild.

The remainder of the solids (=1%) consist of amino acids, vitamins, and minerals. Potassium is often found to make up the larger component of the remaining solids.

However, it has been found that the total amount of these nutrients is not sufficient to cover the nutritional requirements of the birds. Therefore, feeding on nectar alone does not provide sufficient nutrients to sustain the birds.

Varied Lorikeets



Now, back to the pollen. A typical relationship between a plant and an avian pollinator goes as follows:

The bird lands on or next to a flower to gain access to the nectar, which it does by using its beak. The tongue then passes over the flower's anthers to get to the nectar, which is how pollen gets into the bird's beak.

As such, if pollen grains are found in the crops of wild birds, it does not necessarily mean that they ate the pollen with intention. The bird then jumps to another flower, depositing the previously accumulated pollen in the process, and this is how pollination works.

This is a classic symbiotic relationship, whereby the bird helped the plant by facilitating pollination, and in return, the plant provided nectar (food) to the bird. For plants, nectar requires minimal energy to produce. However, pollen production requires large amounts of energy. Therefore, if pollen was a targeted food source for lorries and lorikeets, plants would need to burn a far greater amount of energy to maintain the required pollen output.

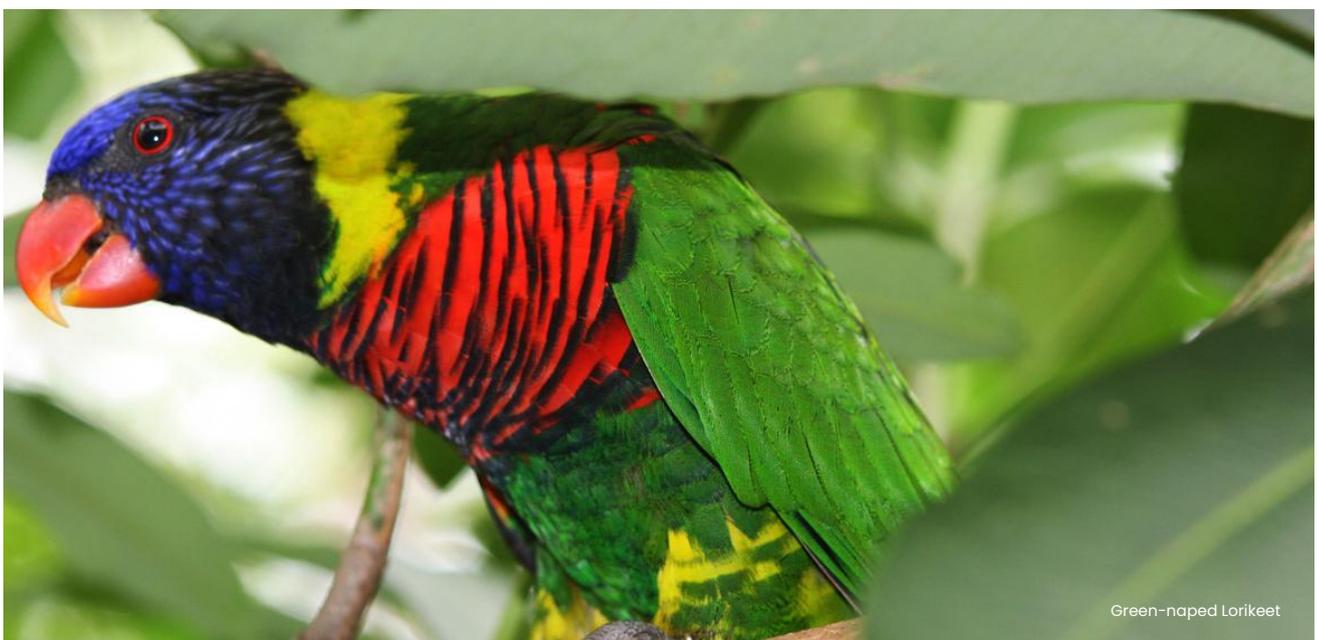
Pollen is also very difficult to digest. Each pollen grain has two protective shells that the digestive systems of most animals are unable to break down.

Pollinivory (=ability to eat pollen) is very rare. It has been identified in *Hymenoptera* and a few other insect groups. These animals have special enzymes capable of digesting pollen or fine mandibles that can crush the covers. We are, at this point, not aware of any similar adaptations in lorries and lorikeets.

There are a few studies that have researched pollen digestion in lorries. In one of them, the authors compared results between Rainbow Lorikeets and Cockatiels *Nymphicus hollandicus*. Surprisingly, they found out that Cockatiels can digest 17% of pollen grains, while for the lorikeets, it was just 7%. Despite the large amount of protein that is contained in pollen, 7% is not enough to cover the nutritional requirements of the birds.

This can be verified by using a simple light microscope to look at the faeces of lorries/lorikeets that are fed pollen. In doing so, you will see that only a very small proportion of the pollen grains are open.

Based on the above-mentioned points, it remains unclear whether lorries can digest pollen as a source of proteins or not.



Green-naped Lorikeet

Indian aviculturist Debashis Banerjee, who has a large collection of lorries and lorikeets, believes that digestion efficiency can be increased by warming pollen in a microwave. During this process, the covers of the pollen grains are destroyed.

Besides pollen and nectar, insects and fruits have also been found in the crops of wild lorries and lorikeets. They have also been observed consuming the liquid that is excreted by *Psyllidae* insects.

This liquid is excreted in drops that then stick to and dry on tree branches and are then picked off and eaten. Considering the inability of lorries and lorikeets to digest complex nutrients, in terms of the consumption of live food, it is unlikely that they eat larger/adult insects; instead, they feed mostly on soft larvae.

So, how much protein do lorries and lorikeets need?

Smaller nectarivorous birds like hummingbirds and sunbirds only require very small amounts of protein to survive. This is hard to believe, as the required protein intake for most other bird species is at least four times greater.

However, several adaptations, such as efficient nitrogen metabolism, make it possible for these species to survive on a low-protein diet.

In one study, which I consider to be very important in terms of lory nutrition, zoologists from the University of Florida compared protein metabolism between Pesquet's Parrots *Psittichas fulgidus*, Red Lorries *Eos bornea*, and Budgerigars *Melopsittacus undulatus*.

Surprisingly, they found out that Pesquet's Parrots and Red Lorries require 2-3 times less protein than a granivorous Budgerigar. Researchers also observed how a change in protein intake affected the weight of the bird.

It was interesting to note that a diet that contained 3% proteins had no impact on body weight in Red Lorries and Pesquet's Parrots but caused significant weight loss in Budgerigars.

In conclusion, we can say that lorries do not require as much protein as other parrots.

Editor's note:

Stay tuned for Part II of this informative article in the next issue.



Purple-crowned Lorikeets

Finch Breeding Diets, **Naturally**

Author
Graham Bull



Australian Yellow Cuban Finch eating green grass seed
Photo Simon Degenhard

Introduction

All finch species have evolved to consume seed as their primary food source. The physiology of all finches confirms this.

A bill designed to extract and de-husk small seeds and a digestive system containing a muscular gizzard whose primary function is the physical breakup of dry, hard seed kernels to allow their complete digestion further down the digestive tract.

In most cases, these features are merely an adaptation to enable wild finches to survive through the harshest of nature's seasons until the more abundant seasons return.

It is generally only during the lean offerings of the dry or cold season (depending on the habitat of the species) that dry, hard seed ever becomes a large proportion of a wild finch's diet.

Such adverse times virtually never correspond with breeding activity in

wild finches. It is only when fresh seeding grasses and live insects abound that wild finches reach peak breeding efforts. This concept is crucial to understanding what comprises an ideal breeding diet for captive finches.

"Feeding Mostly Dry Seed is Neither Natural nor Nutritious "

To subject our captive finches to a diet of mostly dry, hard seed and scarcely little else for most of the time is neither natural nor nutritious for any finch.

Such a meagre diet falls well short of what is required nutritionally to maintain even the most basic standard of bird health, let alone to induce and sustain decent breeding results.

Examining the foraging behaviour of wild finches generally reveals a far wider choice of seed types than is found in most readily available dry bird seed mixes used by aviculturists.



Many wild Australian finches eat Casuarina seeds, including the Beautiful Firetail. Source Shutterstock

What this observation highlights far more, though, is the clear preference by most finch species for half-ripe green seed straight from the growing seed head over and above fallen dry seed. At the time of year when fresh seeding grasses are abundant, and wild finches are at their height of breeding activity, dry seed becomes a far less significant proportion of the wild finch diet.

The main principles to ensuring a seed-based finch breeding diet for captive finches is nutritious and capable of sustaining regular output of healthy young are:

- Providing greater variety in the dry seed component over and above just the usual dry millets and canary seed. Just a small supplementary offering of a diverse range of extra seeds of various grasses, herbs, vegetables and oil seeds is excellent for providing a diverse dry-seed diet. Dry barnyard grass seed based 'Greens'n'Grains' type mixes are also an excellent supplement with widespread appeal to most finch species.
- Providing a consistently reliable daily supply of 'soft' seeds in the form of half-ripe green grass seed heads and sprouted seeds as rearing food.
- Ensuring an equally dependable regular live food supply as rearing food.
- Constant availability of mineral foods.

- Addressing the key dietary preferences of the species being kept where particular species show a strong preference for certain types of live insects, green foods or seed types. Then, incorporating these into the regular foods offered during the breeding season.
- Slight supplementation combined with the above items where a little effort could significantly improve the nutrition offered. Examples of this include mixing a small quantity of seed oil with dry seed, adding some soft food supplement to sprouted seed or providing certain fresh vegetables regularly in addition to the above items.



Casuarina seed is an excellent supplement for most finches and is easily collected. Once the mature cones are picked, the seeds will fall out as the cones dry.

Photo John Tann

[HTTPS://COMMONS.WIKIMEDIA.ORG/WIKI/FILE:ALLOCASUARINA_LITTORALIS_CONES_AND_SEEDS_\(7353483424\).JPG](https://commons.wikimedia.org/wiki/File:Allocastrum_littoralis_cones_and_seeds_(7353483424).jpg)



Barnyard Grass seed heads are an enjoyable and nutritious supplement for your finches
SOURCE SHUTTERSTOCK

The following are examples of different seed types that I have used to provide extra variety in the dry seed component of my finches' diet:

- **Pasture and lawn grass seeds** - phalaris, setaria, cocksfoot, couch, green panic, bambatsi panic, Kentucky bluegrass, rye, fescue, carpet grass, purple pigeon grass, signal grass and sabi grass.
- **Herb and vegetable seeds** - fennel, sesame, lettuce (black and white forms), carrot, chia, caraway, dill, amaranthus, white perilla and basil.
- **Oil seeds:** niger, canola (rape seed), maw, safflower and sunflower. Safflower and sunflower need to be either cracked or sprouted, as most finches are incapable of de-husking these larger seeds.
- **Barnyard grass based Greens'n'Grains mixes** - these are harvested at the green (half-ripe) stage as they tend to drop from the seed head by the time they reach the fully ripe stage. This early harvesting results in a softer seed, which is very palatable to a wide range of finch species.
- **Legumes** - white clover and cracked vetch seed.
- **Tree seed** - Casuarina and Allocasuarina (she-oaks).



Casuarina cones are filled with small seeds that are readily eaten by most finches.
Photo Simon Degenhard



Ground volcanic rock mixed with fine shell grit makes a great mineral food.
Photo Simon Degenhard

Many of these seeds are quite expensive to buy and, at times, difficult to obtain, but a small amount offered regularly is all that is required to dramatically expand the variety of seeds (and nutrients) on offer. A varying selection of a small range of these offered as a supplementary "tonic" seed mix is sufficient. I have provided an extensive list just to show that there are many possibilities, and there is no doubt quite a few other seed types that can also be used.

When sourcing pasture or lawn seeds, it is essential to ensure that the seed is clean and free of any chemical coating, inoculants or powders that are often applied to commercially packaged seeds.

Deteriorating Nutritional Value

From the time ripe seed is harvested, its nutritional value begins to deteriorate. As purchasers of birdseed, we rarely know, with any confidence, the age and, hence, the nutritional quality of the seed we are buying.

When we buy summer-grown seed in late winter or early spring or any seed following one or more years of widespread drought throughout the major grain-growing regions, it is impossible to believe we are obtaining anything near fresh seed. This makes it difficult to be confident that the seed is likely to provide adequate nutrition to our birds.

For this reason, I like to mix my own seed mixes, partly to offer the various seed types in the proportions that my birds make the best use of and to also enhance the nutritional value by mixing in small quantities of seed-based oils, which are rich in essential amino acids.

I make up a cocktail of seed oils, including sunflower oil, canola oil, sesame oil (small quantity only as it has an overpowering flavour and odour), flaxseed oil, wheat germ oil, rice bran oil, hemp seed oil, along with garlic oil. Most of these oils are relatively cheaply obtainable from supermarkets, although commercial avicultural oil-based supplements are also available.

I mix 2ml of this seed oil cocktail to every kilogram of seed using a concrete mixer. I do this with my basic dry finch mix and with my supplementary tonic seed mix. After mixing, the seed is stored in old chest freezer bodies (for air-tight and vermin-proof storage). It stores well this way for months without any spoilage.

A Suitable Breeding Diet

Having said all the above about dry seed, it is the quality and consistency of the non-dry seed component of the finch diet that makes it a suitable breeding diet.

In particular, the regular provision of key rearing foods provides a large part of the stimulus to induce breeding activity in the first place and later provides most of the necessary sustenance for the developing young finches.

Much of this rearing food for wild finches comprises half-ripe green grass seed and live insects.

In captivity, too, the consistently dependable supply of these key rearing foods is a vitally essential prerequisite to achieving consistent breeding success with most finch species.

Half-ripe Seed and Green Food Offers Superior Nutrition

The green half-ripe stage of seed development offers far superior nutritional quality compared to the dry, fully ripe stage for the same seed type. Sprouted seed also has vastly improved nutritional value compared to dry seed. Both half-ripe and sprouted seeds are far more palatable for finches, too,



offering a far less challenging softer kernel, which is easier (and no doubt more enjoyable) to ingest and later regurgitate to feed their progeny.

Consistency of supply is of paramount importance to the finch breeding diet, yet the natural conditions necessary for a consistent supply of seeding grasses are highly variable and heavily dependent on favourable seasonal conditions, which vary enormously throughout different times of the year. This is especially an issue where at least some of the breeding season for the finch species kept does not coincide with the period of locally abundant grass seed head supply.

This supply shortfall can be overcome or at least partly offset by collecting and freezing excess quantities of seed heads whilst they are most abundant.

These frozen heads can be later apportioned out and offered regularly to your finches over the remainder of the breeding season when they are no longer freshly available.



Dandelion is a fantastic green food that is enjoyed by finches.
Source Shutterstock

In recent years, the commercial sale of half-ripe green millet 'milk seed' has allowed many finch breeders the opportunity to offer this consistency of green seed supply for all months of the year. The same nutritional benefit can be achieved by collecting the best quality locally abundant grass seed heads. Within reason, you can do no wrong with the types of seeding grasses offered, and as with the dry seed component, extra variety offers a more nutritionally complete diet.

Some prime examples of top-quality grass types for seed head collection are green panic, summer grass, barnyard grass, palm grass, panic veldt, and veldt oats. If you have sufficient garden space in your yard, an area can be sown with millets during the warm summer months for a crop of excellent quality green seed heads.

If these are grown, it is best to wait until the seed heads are weighty with full kernels before harvesting.

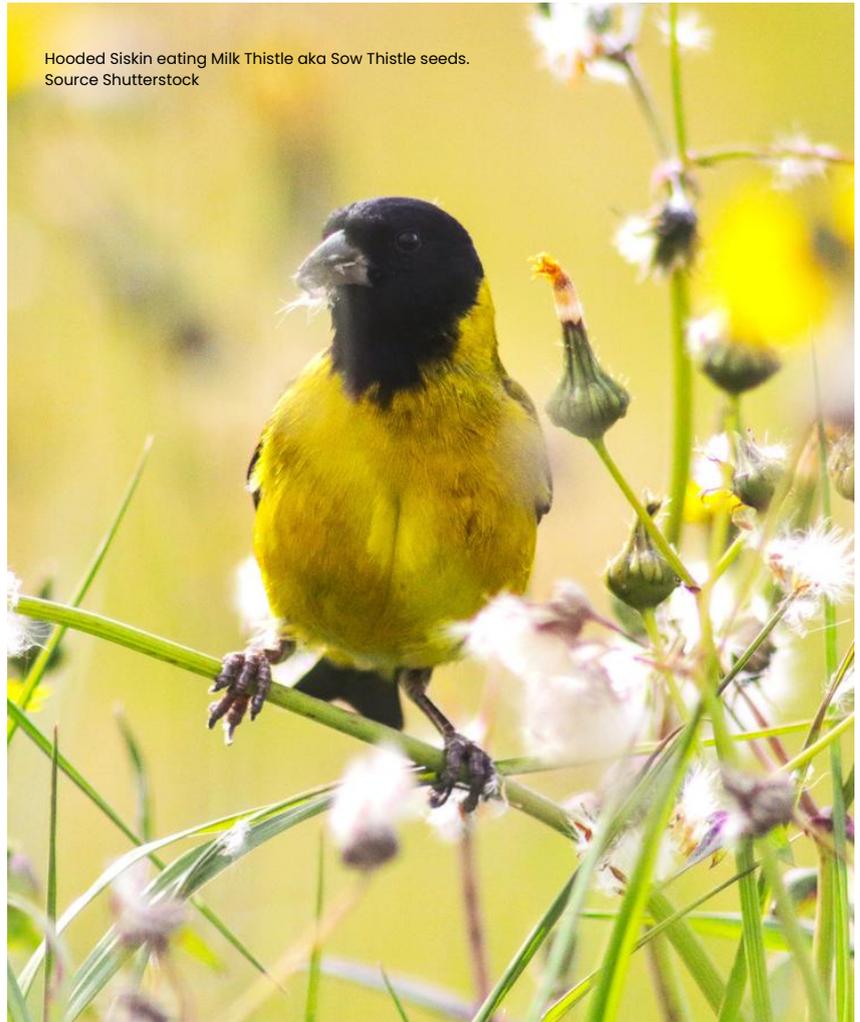


Amaranthus seeds can be fed both at the green half-ripe stage and when dry and fully-ripe
Source Unknown

Various weeds also offer excellent nutrition to the green component of the finch diet – **chickweed, dandelion, milk thistle, and amaranthus** are a few prime examples.

However, only grass seed heads freeze well and retain their physical structure and nutritional value. Most weeds, when frozen, turn to mush upon thawing out.

Hooded Siskin eating Milk Thistle aka Sow Thistle seeds.
Source Shutterstock

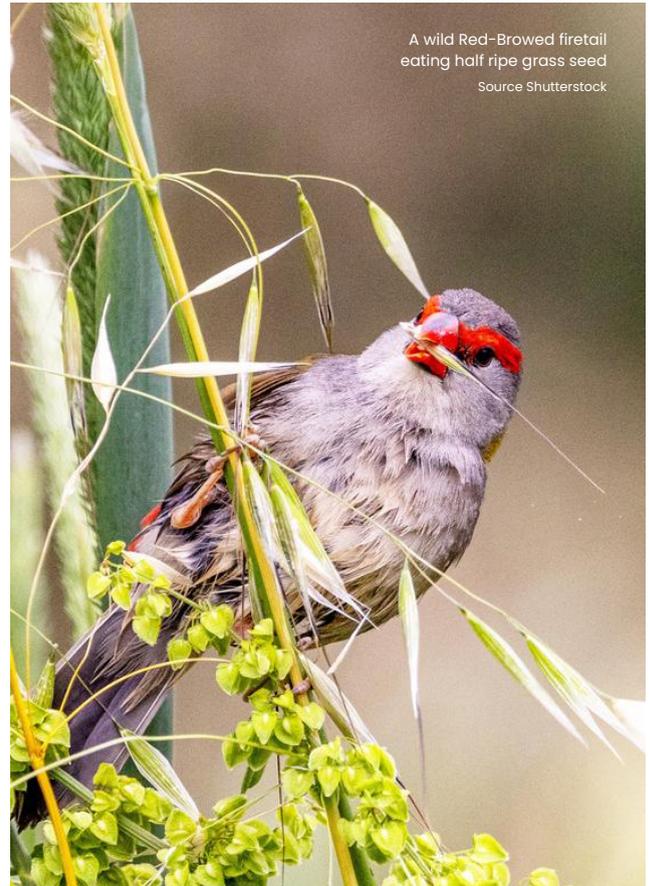


Fresh seeding grasses are relished by most finches, including Red-cheeked Cordon Bleus.
Photo Simon Degenhard





Sprouted seed and veggie mix - the seed is sprouted, then frozen veggies are added before being frozen in large, lidded plastic ice cream containers, as per the author's method. Photo Simon Degenhard



Sprouted Seed

I offer sprouted seed as the one constant daily soft seed offering to my finches throughout the year, with regular grass seed heads and weeds offered freshly as a supplement whenever seasonally available.

This still gives my birds the necessary consistency of nutritious soft seed supply plus the added benefit of the variety offered by the range of grass seeds and weeds found throughout the year.

I still collect and freeze quantities of any locally abundant grass seed heads whenever they are easily available for added "off-season" variety, but the sprouted seed is the one guaranteed soft seed constant that my breeding birds can depend on every single day.

To make the daily provision of sprouted seed a relatively simple task, I make up a bulk batch of sprouted seed once per month and freeze it for daily feeding thereafter.

The process of sprouting the seed is quite simple. I use a basic finch mix of the various millets and plain canary seed. I put the seed into several plastic containers and then add a solution of 5g (1 teaspoon) Virkon S (a soluble animal-safe disinfectant powder) per litre of water. I add just enough of this water and Virkon S solution to submerge all the seed. This is left to soak for about half a day. I then drain off the water solution without rinsing and place all the soaked seed into a large open tray. I stir the soaked seed twice per day until it is evenly sprouted with visible sprouts on most grains of seed, and then freeze it in ice-cream containers (with lids on).

The amount of time the seed takes to sprout varies according to the ambient temperature but usually occurs in around two days. Stirring the sprouts moistens the top layer and allows the lower layer to dry out a bit, thus achieving a mix of sprouts roughly all at the same stage.

Failure to stir results in a very uneven sprouting rate from advanced at the bottom to barely sprouted at the top and in a moister bottom layer that then freezes into a hard block.

A well-stirred batch of sprouts with an even moisture level throughout stays relatively loose when frozen and is easy to scoop out for feeding.

When making sprouted seed in late autumn and early winter, I mix in a few drops of Vetafarm Breeding Aid or liquid Pentavite just before putting them into the freezer.

This is partially to help prevent egg binding, which can affect some breeding hens as the temperatures cool down at this time of year, and to also increase the nutritional value of the sprouts at a time of year when young finches need to emerge from the nest well developed to survive.

Fresh Green Vegetables

Various fresh green vegetables may also be offered to enhance the green component of the finch breeding diet. I regularly provide my breeding finches with small pieces of Lebanese cucumber or broccoli florets skewed onto a small wire hook at perch height, along with fresh leaves of broadleaf vegetables, including bok choy, chicory, kale and cos lettuce.



Lebanese cucumber – a highly favoured green food.
Photo Graham Bull

These are generally stripped back by the birds to virtually nothing by the end of the day. Other breeders also offer different varieties of vegetables, with some providing them blended up and added to the soft food and/or sprouted seed mixes.

Live Food, the Other Key Natural Breeding Food

Live insects are the other key natural breeding food for most finch species. As with the soft seed, a consistently dependable live food supply is essential for breeding pairs to ensure the best possible breeding results. Some finch species will abandon or eject hatchlings from the nest if the live food supply is insufficient or irregular. The most commonly fed finch live foods are mealworms, termites and bush-fly maggots.



Termites ready to be fed to the birds
Photo Graham Bull

Mealworms and maggots can be produced by finch breeders at home or purchased from commercial suppliers. Whilst termites are collected from their mounds in the bush. Mealworms offer a convenient source of live food for the aviculturist, as they are readily available commercially and quite easy to breed. However, they generally offer poorer quality nutrition to finches than do either termites or maggots. Many of the smaller finch species are unable to efficiently eat mealworms, especially when they are fed at full size.

Many waxbills and other small finches will just bite off the heads of the mealworms and discard the remaining carcasses. The larger finch species are generally better able to make the best use of the whole mealworm. Excessive reliance on mealworms as finch live food over long periods can inhibit the birds' ability to absorb calcium.



Automated custom-made tumbling machine for extracting termites.
Photo Graham Bull

This can be slightly offset by culturing mealworms in pollard rather than a bran-based medium, but even then, the balance of nutrients is well short of those contained in termites or maggots. Feeding them out to finches at a smaller size offers slightly improved nutrient composition and allows smaller finch species a better opportunity to consume them entirely.

Where I live, I am very fortunate to have relatively easy access to termites from the surrounding bush. I also regard termites as the superior live food for most finch species, so I provide my birds with a generous daily supply of live termites.

I break up the termite mound with a spade and a large screwdriver, then tumble the termites and fine debris out with an automated custom-made tumbling machine.

A similar result can be achieved by simply tapping the termite-laden chunks of mound together into a large bucket, thus shaking the termites out. I extract a week's supply of termites and refrigerate them in lidded plastic containers, each containing one day's supply.

Refrigeration forces the termites into a state of hibernation for up to a week. Once the termites are taken out of the fridge, they come "back to life" as they warm up. If refrigerated for much over a week, the termites die and the whole container clods up into a mouldy mess.

By extracting the termites weekly, I am cutting down on the daily tasks required

to offer my birds consistent quantities of the best finch live food available.

Bush-fly maggots are almost as good as termites nutritionally and are cultured at home in moist bran and milk powder by most finch breeders who regularly feed them to their birds.

Most breeders who produce them use broadly the same method of production and have developed simple routines for their 'fly box' to regularly produce ample quantities of live maggots.

Some finch breeders also breed crickets as an alternative live food supply, but these are generally more suited for feeding to African Weavers and insectivorous softbill species rather than the usual range of small finches. Crickets offer a very nutritious alternative option for added variety but are not a common staple live food for finches.

Moths, vinegar flies and various other insects can also be attracted, cultured or trapped for extra variety, but the key essential with live food as a dependable source of protein for captive finches is to establish a regular supply of one of the three main easily accessible insects.

Of these, I most highly recommend termites, but if these are not a feasible regular option for you, then maggots are the next best option for most finches, followed by pollard-fed small-sized mealworms.

Mineral Foods are also Important

Minerals are the other important food group for a complete finch breeding diet. The first mineral item that is essential to any seed-eating bird is insoluble grit to assist in the physical breakdown of hard seed kernels within the gizzard. For this purpose, finches (and all other granivorous birds) ingest small rock particles, which are then contained within the gizzard.

The gizzard is a tough, muscular organ that contracts to grind the seed kernels using the muscular force of the gizzard wall combined with the abrasive force of the hard grit particles, breaking them into much finer pieces to allow for more complete digestion by the bird.

Coarse sand or very fine gravel contains appropriate-sized 'gizzard grit' for finches, so either of these should be available to captive birds.

Soluble mineral foods provide a source of minerals for the birds to absorb into their body. These minerals are important for the normal nutritional maintenance of any finch, but when birds are breeding, they experience significantly increased demand for essential calcium and other minerals as they produce eggs and feed developing young, which themselves have growing bones and other organs that require adequate nourishment to form properly.

If the aviculturist does not offer sufficient mineral foods, the breeding bird's own reserves may be depleted of these minerals to form eggs and feed young, etc.



This highlights the importance of a constant supply of suitable mineral foods to ensure a complete finch breeding diet for healthy breeding birds as well as regular output of young finches.

The best soluble mineral foods are eggshells, cuttlebone, fine shell grits, Canunda shell, and charcoal, as well as some commercial mineral foods.

I use all the above natural mineral foods and combine them into a fine mineral mix, which is constantly available to all my breeding birds. I crush the eggshells, cuttlebone and charcoal to roughly the same particle size as the fine shell grit and Canunda shell, then mix them, along with PVM powder and Biocal (Commercial mineral supplements available from Australian Pigeon Company).

For those who would prefer not to mix their own, a great commercial option is 'Fitgrit' from Naturally for Birds, which is an excellent, readily available mixture of most of these mineral foods that many finches enjoy. Larger pieces of eggshell and cuttlebone are also provided to each breeding aviary, allowing the birds to pick away at these when they prefer to do so.



Baked chicken eggshells are a great source of calcium.
Photo Simon Degenhard



Mixed finch species eating at a well-thought-out feeding station.
Photo Simon Degenhard

Closing Remarks

The above is what I regard to be a complete breeding diet for most finches available in Australian aviculture. Breeding finches successfully cannot be achieved using a 'one size fits all' approach in terms of diet, as is the case with all other aspects of aviculture, especially when keeping the more difficult species.

However, the basic principle is the same for all species – **If you mimic as best you can the natural breeding triggers, resources and preferences for your chosen species, then you are maximising their prospects for successful breeding outcomes.**



The Bear Necessities



Author Aparna Pujar
Photos Wildlife SOS

Introduction

Slurp, slurp... Believe it or not, that is the sound a certain mighty giant makes while enjoying a meal of tiny insects. Yes, we are referring to Sloth Bears, a distinctive bear species found in India. **Despite their name, these bears are not linked to sloths; they merely resemble them due to their long, sharp claws and shaggy fur.**

Sloth bears inhabit forests and are key indicators of a healthy ecosystem.

They are well-adapted to a range of habitats, including dry and wet tropical forests, as well as thorny woodlands featuring boulder caves.

Regardless of their diverse surroundings, their diet is remarkably consistent.

As omnivores, they eat a broad range of fruits, insects, and small animals, with seasonal variations in their diet occurring.

During fruit-bearing periods, they enjoy berries, figs, and other wild fruits, although these only make up a small part of their diet.

Approximately **90%** of their diet consists of insects like **termites, ants, beetles, larvae, and centipedes**, categorising them as **myrmecophagous mammals**.

Their long, sharp claws are particularly effective for digging into termite mounds and climbing trees. Honey and jackfruit are two favoured delicacies that entice Sloth Bears to climb trees. Their elongated, conical snouts, which lack upper front incisors, are perfectly designed for ingesting large quantities of termites. Remarkably, they can voluntarily close their nostrils while sucking up termites.

Captive Diet

Providing a suitable diet for Sloth Bears in captivity presents various challenges. These bears have a low metabolic rate, necessitating easily digestible foods high in protein and fat.

Typically, their morning and evening meals should amount to 2-4% of their body weight.

Additionally, they can be fed fruits throughout the day to meet their nutritional needs. This will also help them stay hydrated and ensure they have a balanced diet.

A healthy Sloth Bear typically eats about 10% of its body weight each day. For instance, a Sloth Bear weighing around 95kg would consume approximately 9.5kg of food daily. Zoos provide various foods to meet their nutritional needs, including:

• Bear Porridge

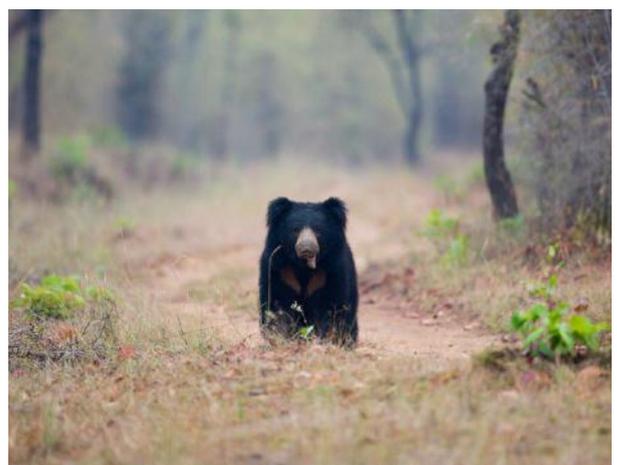
Bear porridge is a delicious and easily digestible meal that is favoured by Sloth Bears. It can be prepared using 10% soy, 40% cornmeal, and 50% sorghum. Mix these ingredients and boil them thoroughly until they reach a thick, slurry-like consistency. The addition of grated eggs and honey makes it even tastier and more nutritious.

This porridge can be offered once a day, preferably during the morning feed.

• Vegetable Soup and Daliya

Vegetable soup provides a nourishing and satisfying meal for Sloth Bears. To make it, simply blanch a variety of vegetables, then mash them into a thick soup. The following is an example of types of vegetables and percentages of each that can be used: bottle gourd (10%), sweet potato (10%), green peas (10%), pumpkin (20%), beetroot (20%), and carrot (30%). Sloth Bears enjoy slurping on this hearty meal.

Soups and khichris can be served either in the morning or evening. Cooked daliya or broken wheat can also be a great meal for Sloth Bears. As it is rich in both carbohydrates and fibre, it will keep them fuller for longer. Daliya can also be boiled with the vegetables at a 50:50 ratio using double the amount of water to make khichri and then served to Sloth Bears after it has cooled.



Fruit Salad

Fruit salads can be made with available seasonal fruits. For example, combine cubed watermelon (30%), muskmelon (15%), banana (15%), sapota (15%), orange (15%), and apple (10%), and then drizzle with honey or liquid jaggery. Additionally, you can add pumpkin seeds, cashews, raisins, finely chopped dates and figs. Fruit salads make a great midday snack, keeping the bears energised and hydrated.

Live Food

Offering live food is essential for captive animals to encourage their instinctive behaviours. Sloth Bears, for instance, have a strong preference for consuming insects, making it advantageous to regularly provide them with superworms, mealworms, and roaches. Furthermore, placing termite mounds within their habitat allows them to engage in the enjoyable activity of dismantling the mounds to access the termites inside. Fish and lean meats are also reliable protein sources for Sloth Bears. Live food can be included in their initial meal of the day or served alongside fruit in the afternoon.

Supplements

Meeting nutritional requirements solely through food can be difficult; hence, supplements like calcium, multivitamins, and minerals are often essential to maintaining overall health. These supplements can either be mixed into food or added to fruit juice for consumption. Adding fish oil is also beneficial as it contains omega-3 and omega-6 fatty acids.



Nutritional Variations Across Different Seasons and Regions

During the winter, it is advisable to avoid feeding refrigerated fruits and vegetables, such as cucumbers and watermelons, when the temperature drops significantly.

Egg yolks are a great addition to the diet during colder periods and can be given regularly during winter. Conversely, in the summer, refreshing beverages made from ingredients such as sugar cane, watermelon, and cucumber can help sloth bears combat the intense heat.

Blending these ingredients and serving the mixture in a feeder/drinker that allows them to sip or slurp it up can be quite effective.

The benefits of offering frozen food remain a subject of discussion.

Food as Enrichment

Captive animals require various forms of enrichment, and one simple method is using food as a source of enrichment. Food can easily be used to motivate Sloth Bears to forage and remain active over extended periods.

Effective food enrichment ideas include:



- Stuffing a whole coconut with their favourite fruits and vegetables and sealing the opening with leaves or plant matter. The Sloth Bears will spend considerable time extracting the fruit pieces from inside the coconut.
- Attaching slices of watermelon and musk melon to branches within their enclosures. The Sloth Bears, being adept climbers, can reach these treats even when placed on the highest branches.
- Creating an opening in bamboo shoots and filling them with honey, then allowing the Sloth Bears to lick and suck them as they enjoy the sweetness.
- Placing a pile of cut grass mixed with insects like mealworms and superworms inside their enclosure for the Sloth Bears to search through to find these hidden crawling treats.
- Smearing honey on tree branches within their enclosure to encourage the Sloth Bears to move and forage amongst the branches.
- Placing pieces of cut sugar cane into a burlap sack and then filling it with dry hay so that the Sloth Bears can forage for them and then chew on these sweet treats.

Food for Training

Appropriate training of Sloth Bears in captivity is crucial. It aids in routine health examinations, weight measurements, blood drawing, and medical treatments. Since Sloth Bears enjoy honey, you can mix it with water at a 40:60 ratio, then tip it into a sipper bottle and offer it to them as a reward when they follow commands.

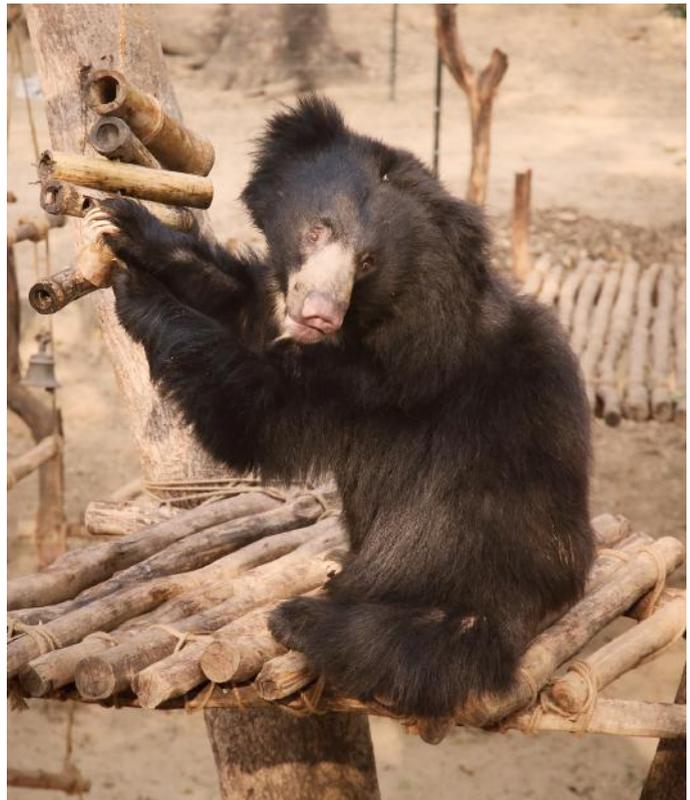
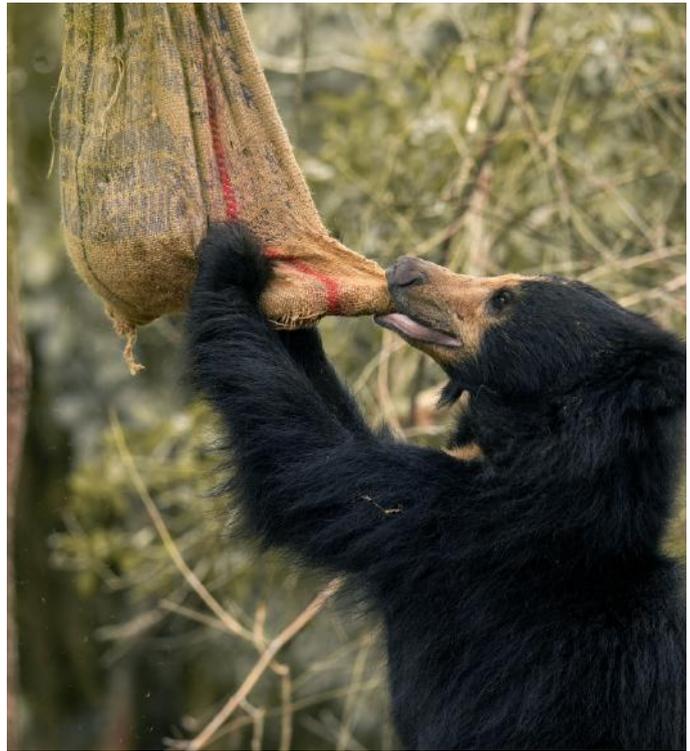
Commands might include getting onto a weighing scale, extending a paw, or standing or sitting. Although this training takes time, once the bears are trained, all check-ups can be conducted without stress. This habituation benefits both the animals and the staff as the bears become accustomed to the routine and commands.

Conservation

Due to the destruction of their habitats and the limited remaining resources, Sloth Bears are driven into farmland areas. They are especially attracted to crops such as sugar cane, corn, groundnuts, and certain millets, which then often leads to conflicts with farmers.

Frequently, Sloth Bears become unintended casualties of traps set to protect crops.

Raising awareness could significantly improve on-the-ground conservation efforts, as the current lack of community understanding exacerbates these conflicts. Classified as a Schedule I species by CITES and considered vulnerable by IUCN standards, it is crucial that forest department-led conservation initiatives be properly



executed and enforced to ensure their protection. Preserving their natural habitats is vital for their continued survival. Activities like mining, agriculture, and industrialisation have increased their vulnerability.

Agricultural fields such as sugarcane and millet provide excellent hiding spots for Sloth Bears with cubs, offering them food and protection, which is why they often seek refuge there.



Termites spend months constructing their mounds, and if the area is cleared for human activities, they can no longer survive there. Many ants live in trees and depend on large trees to flourish; thus, deforestation destroys their habitat. Additionally, the decline in these prey species negatively affects Sloth Bears.

Historically, Sloth Bears were exploited as dancing bears for entertainment and were a significant attraction in circuses, a practice now banned.

In various regions of India, it was once believed that wearing a string of Sloth Bear hair would bring good luck.

People used to pluck tufts of fur and tie them to children's wrists or necks, a practice that has declined thanks to increased awareness and education born through conservation efforts by both government agencies and NGOs.

Ex-situ conservation is also crucial for spreading awareness and educating the public.

Zoos housing these animals allow people to observe them closely, learn about their diet and habitat, and participate in awareness sessions that highlight the importance of this species in the ecosystem.

Conclusion

Ensuring that Sloth Bears in captivity receive proper nutrition is essential. Neglecting their dietary needs can lead to issues like arthritis, malnutrition, a weakened immune system, and mental health problems.

Sloth Bears are a keystone species vital for maintaining ecosystem balance. Achieving coexistence between local communities and Sloth Bears is essential for conservation efforts.

Raising awareness about the significance of these bears and how to avoid conflict is crucial. Farmers need to be educated about non-lethal methods to keep Sloth Bears away from their crops. Inhumane traps and snares only heighten conflicts between humans and bears.

Sloth Bears are inherently shy and do not intend to harm anyone, but they can become aggressive when defending themselves. Training on how to react and protect oneself when encountering a Sloth Bear is necessary for safety.

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Is That Poop Normal?

Your Bird May Be
Trying to Tell You
Something About
Its Health!

Author and Photos
Professor Bob Doneley
BVSc FANZCVS (Avian medicine)



Introduction

Do you know what was one of the most repulsive jobs in medieval England? **How about the 'Groom of the King's Close Stool'**, a role created during the reign of Henry VIII to monitor and assist in the king's bowel motions?

He was responsible for supplying a bowl, water, and towels, monitoring the king's diet and bowel movements, and perhaps even wiping the royal backside!

There are two even weirder things about this; firstly, because of the close contact with the monarch, it became a much sought-after position, and secondly, it wasn't abolished until 1901!

This is a rather unusual introduction to my article, but it leads me nicely into the topic of assessing your bird's droppings.

Did you ever find yourself wondering if a change in your bird's droppings meant anything? Is it some sort of secret gateway into a bird's health? And if so, what can you learn from them?

The answer is 'yes' to all of these questions. As part of my clinical examination of any bird, I look at its droppings as a way of understanding what is happening. Not quite Groom of the Stool material, but I can gather a lot of valuable information from a faecal sample.

What's Normal?

To understand how a faecal examination can inform us about a bird's health, we must first explore how droppings are formed.

When a bird like a parrot eats, the saliva in its mouth and crop moistens the food.

Two stomachs are involved: the proventriculus, a thin-walled organ where hydrochloric acid is added, and the ventriculus (gizzard), a thick-walled, muscular organ that grinds food into a paste.

The protein in the diet is absorbed and utilised in the body for a multitude of purposes. What isn't used is converted by the liver into uric acid (a relatively non-toxic material).

This uric acid is filtered out of the bloodstream by the kidneys and forms urates, a thick, sludgy white material.

To help flush all this urate sludge through the kidneys, birds produce very watery, dilute urine.

As they don't have a bladder, this large amount of urine, along with the urates, goes directly into the cloaca.

There, some of the urine is backflushed into the rectum and re-absorbed.

The faeces, urates and urine are mixed in the cloaca (from the Latin word, *cloacae*, meaning 'sewer'), and when enough has accumulated, it is expelled through the vent (the external opening from the cloaca) as droppings.

Birds' droppings are, therefore, made up of three separate components: **faeces, urates and urine.**

In a healthy bird, the faecal portion should be formed and homogeneous, with little odour (except for poultry, waterfowl and carnivorous birds). The colour should range from brown to green.

The urates should be a crisp white and slightly moist. (Old droppings will have greenish urates as pigment leaches out of the faeces.) The urine should only extend a couple of millimetres past the dropping.

A close examination of the droppings is a valuable starting point for a clinical examination.



What Do I Look For?

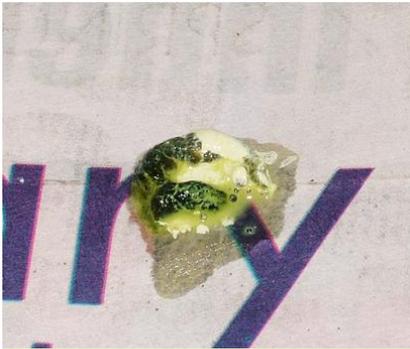
There are some obvious things I'm going to look for in a faecal examination, but it's not just about looking at the droppings on the floor of the cage. I also look at the bird's vent region, the perches, and the food and water dishes. But let's start with the droppings themselves.

1. Faeces

The faecal material should be firm (but not dry), formed, a greenish-brown colour, and with little or no odour. **Abnormal faeces can be:**

Unformed and loose	Diarrhoea
Small, very dark (blackish)	Bird may not be eating.
Large, soft, formed faeces	Egg-laying birds or birds with an internal mass such as a tumour or a retained egg.
Bulky, pale formed faeces	Maldigestion or malabsorption (e.g., pancreatic insufficiency).
Whole food (especially seed) in the faeces	The proventriculus and/or ventriculus is not functioning normally. This could be due to Avian Bornavirus, gizzard worms, yeast infections, Macrorhabdus (megabacteria), lead poisoning, etc.
Malodorous droppings , often very sour smelling	Often associated with bacterial overgrowth (especially Clostridia).
Bright red blood in the droppings	Usually means a lesion in either the cloaca (constipation, inflammation, and even cancer) or the oviduct (egg binding, metritis, etc.).
Bulky black droppings	Referred to by the name melena and indicate bleeding in the stomach or intestines.





Normal droppings are made up of three separate components - faeces, urates, and urine



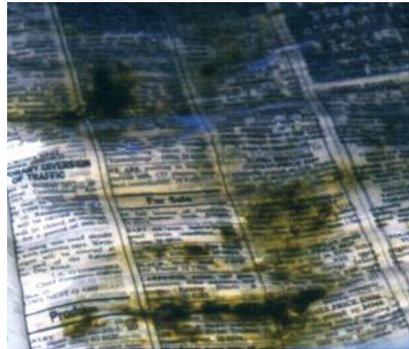
Undigested seed in droppings indicates that the proventriculus and/or ventriculus is not functioning normally



Normal caecal dropping from a chicken



Haematuria, aka blood in the urine, indicates kidney disease or lead poisoning



Diarrhoea presents as watery, unformed faeces. Don't confuse this with excess water in normal faeces



Green discoloured urine often indicates liver disease



Bulky, pale, formed faeces indicate maldigestion/malabsorption problems e.g. pancreatic insufficiency



Black, often sticky droppings are referred to as melena and indicate bleeding in the stomach or intestines



Droppings in the food bowl are often encountered when a perch is located directly above and present a real risk in passing on infectious diseases



Droppings such as this indicate anorexia



The dropping of an egg laying hen



Polyuria - an excessive amount of urine

2. Urates

The urates should be soft white in colour and smooth in appearance.

Abnormalities include:

Bright white, crystalline urates	Dehydration
Green urates	Often indicative of liver disease. (But there is a trap for young players – urates more than a few hours old often turn green as pigments leach into them from the faeces).
Pink urates	Seen in cases of kidney disease and, especially in Amazon Parrots and Galahs, lead poisoning is at the top of the list.
Yellow urates	Often associated with anorexia.
Orange urates	often indicate that a vitamin B injection may have been given in the past few hours.

3. Urine

The urine should be clear in colour and not extend more than a few millimetres from the faeces and urates. Abnormalities include excessive urine, decreased urine, and colour changes.

An excessive amount of urine is called 'polyuria' (poly = much; uria = urine). This can be quite normal.

True polyuria is usually accompanied by excessive thirst and suggests kidney or liver disease.

True polyuria should not be confused with:

- So-called 'excitement polyuria' – the excess urine produced by an excited or nervous bird.
- Lorikeets, due to their liquid diet, will produce large amounts of urine, which should not be mistaken for pathological polyuria.

- Birds eating pellets often drink more water because of the dry nature of the pellets, and this causes polyuria.
- Baby birds being hand-reared often have large amounts of urine because of the amount of water in their diet.

Little or no urine – suggests severe dehydration and possible renal failure.

Discoloured urine (pink, green) – similar causes to discoloured urates (lead poisoning, liver disease).

Other Clues

I also look under the bird's tail, around and under the vent for more clues. Dried faecal material and urates plastered to the feathers below and around the vent is often mistaken for diarrhoea.

When, in fact, it is a sign of weakness – the bird is physically unable to 'pump' as it defecates, and material in the cloaca just dribbles out.

This could be nearly anything – the bird's belly may be swollen with fluid or fat, it could be very sick, it could have a spinal lesion that results in incontinence, and so on. In poultry, this is called 'vent gleet', but it isn't a disease in its own right – just a sign of disease.

Where the droppings land also gives me clues about the bird's husbandry. A lot of dried faecal material on a perch tells me the perch is almost certainly too large for the bird, and I'll start looking for foot problems such as bumblefoot.

Faecal material in food and water dishes is the result of placing perches directly above the dishes, but the real risk is passing on infectious diseases such as canker, *Macrorhabdus*, coccidia, and worms.

What's Next?

Once I've finished my faecal exam, and if I think there is a problem with the droppings, I'll collect further samples; faeces to check for parasites, abnormal bacteria, *Macrorhabdus*, or other yeasts; blood tests for liver and or kidney problems, and so on.

As a sideline, I occasionally have people tell me their birds can't have worms because they have not seen any in their droppings.

The only times I see worms in the faeces are when the bird has just been wormed (and is passing out dead worms) or if the bird has tapeworms, which pass small white segments (packets of eggs) that are visible to the naked eye.

Otherwise, the only way to tell if your birds have worms is a microscopic exam of the faeces looking for eggs.

Conclusion

Unlike medical physicians, my patients can't tell me what is wrong with them. I have to work like a detective, searching for evidence and clues and then putting it all together to reach a diagnosis.

Looking at the droppings is an important aspect of looking for clues and, therefore, is an important part of a physical examination.

Messy, maybe, but at least it's better than being the **'Groom of the King's Close Stool'!**





Reptile Nutrition in Captivity

Integrating Evidence-
Based Strategies,
Behavioural
Considerations, and
Dietary Advancements

Author
Soham Mukherjee



Photos
Taranjeet Singh

Ensuring that reptiles thrive in captivity demands a comprehensive understanding of their nutritional ecology, combined with practical, evidence-based strategies for providing a balanced diet.

Historically, much of the guidance on reptile feeding regimes in managed settings was anecdotal or based on broad comparisons to wild diets. As herpetological husbandry evolved, so too did our insight into the nuanced dietary requirements of these diverse ectotherms.

Research now focuses not only on the macronutrients and micronutrients they require, but also on how environmental parameters, life stage, and behavioural ecology influence nutrient uptake, metabolism, and overall health (Mader, 2006; Divers & Mader, 2005).

A Remarkable Range of Dietary Niches

Captive reptiles span a remarkable range of dietary niches, from obligate carnivores such as large constrictor snakes to herbivorous chelonians subsisting on fibrous plant matter and omnivorous lizards that exploit a broad array of foods. Understanding these nutritional spectra is crucial.

Carnivorous reptiles often benefit from whole-prey feedings because such prey provides a complex nutritional package of proteins, fats, minerals, and vitamins in their natural proportions (Frye, 1991; Oonincx & Dierenfeld, 2012). Rodents, fish, or birds offered to predatory reptiles should be selected with care to minimise pathogen exposure and to ensure a favourable nutrient profile that closely approximates wild prey.

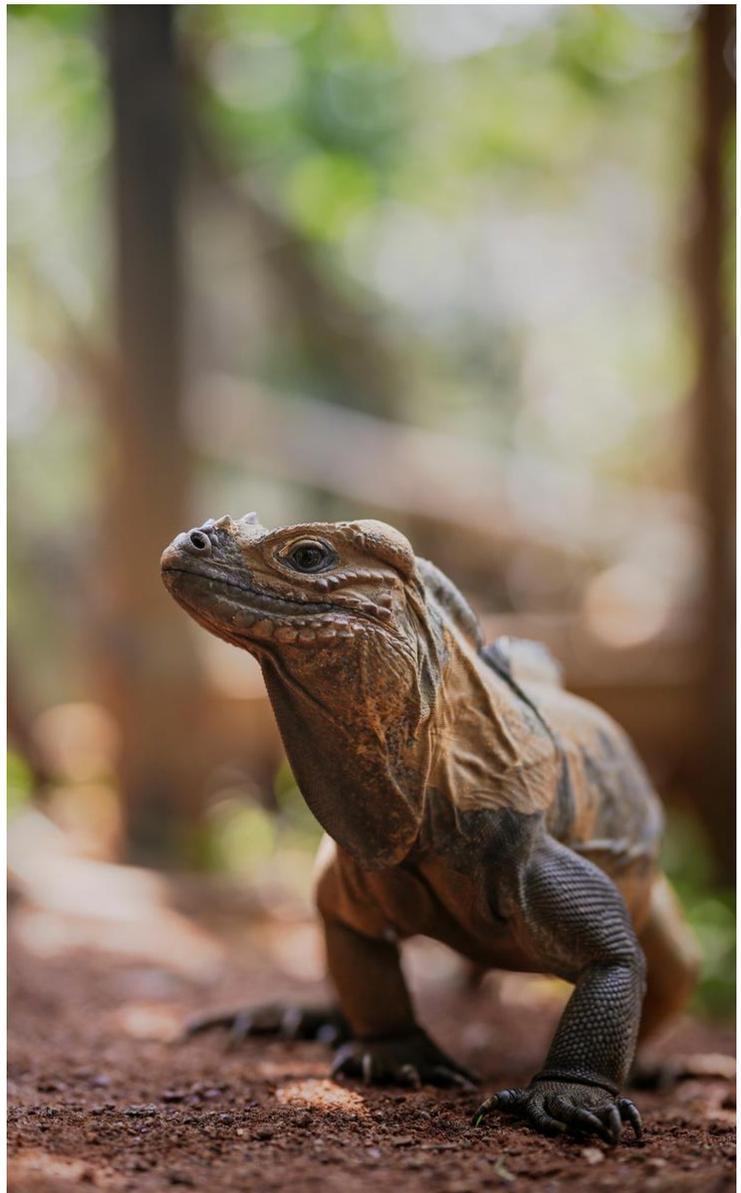
By contrast, herbivorous reptiles pose a different challenge: fresh greens, vegetables, and flowers available in the marketplace can differ significantly from the fibrous, mineral-rich foliage consumed in the wild.

Achieving appropriate calcium-to-phosphorus ratios and adequate levels of essential micronutrients within this limited palette requires careful dietary planning, supplementation, and continuous reassessment (Highfield, 1996; Oonincx et al., 2015).

Insectivorous and omnivorous reptiles introduce yet another layer of complexity. Feeder insects, including crickets, mealworms, and locusts, are widely used in captivity

because they are readily available, easy to breed, and well-accepted by many species. However, their intrinsic nutrient composition may fail to meet a reptile's full requirements without additional 'gut-loading' or dusting protocols to enrich them with calcium, vitamins, and trace minerals (Finke, 2013).

This practice, wherein insects are fed nutrient-rich diets before being offered as prey, has been shown to significantly enhance their nutritional value. Similarly, varied feeding—interchanging different insect species and offering occasional invertebrate treats—prevents monotony and helps balance the nutritional profile. For omnivores, the successful dietary matrix often involves a combination of animal and plant sources, each reinforcing the other's nutrient shortfalls.





How Food is Presented

An equally important, though sometimes underappreciated, dimension of reptile nutrition is how food is presented. In the wild, reptiles invest time and energy in locating, capturing, and processing their meals. In captivity, providing food without environmental context can suppress natural behaviours, potentially reducing stimulation and hindering normal digestive and metabolic processes (Oftedal & Allen, 1996).

Enrichment strategies that encourage natural foraging—such as scattering leafy greens around a tortoise’s enclosure, using feeding puzzles for lizards, or offering arboreal snakes suspended prey items—help maintain behavioural complexity and proper energy expenditure.

Such feeding methods also promote a healthier body condition and can mitigate obesity, a recognised and increasingly common issue in captive collections (Donoghue & Langenberg, 1994).

Light, Temperature and Humidity

Light, temperature, and humidity regimes in captivity significantly influence a reptile’s nutritional physiology. Adequate UVB exposure is central to vitamin D₃ synthesis, facilitating proper calcium metabolism and helping avert metabolic bone disease, one of the most frequently encountered nutritional disorders in reptilian husbandry (Holick, 2004; Mader, 2006).

Moreover, the gut microbiome—often shaped by environmental conditions and diet—plays a pivotal role in nutrient absorption and digestion.

For herbivorous and omnivorous reptiles, in particular, microbial fermentation in the hindgut allows for the breakdown of complex plant fibres and enhanced extraction of nutrients.

Captive conditions that do not support a stable or healthy gut microbial community may lead to malabsorption, deficiencies, and suboptimal growth rates.

Nutritional Disorders

Nutritional disorders remain a critical concern. Metabolic bone disease, prompted by inadequate calcium or improper calcium-to-phosphorus ratios, is well documented.

Hypovitaminosis A, resulting from diets low in carotenoid-rich vegetables or organ tissues, can compromise skin integrity, vision, and immune function (Frye, 1991; Mader, 2006).

Hypervitaminosis, conversely, emerges when supplementation is not meticulously calibrated.

Addressing these disorders requires a proactive, science-based approach:

Routine veterinary assessments, dietary adjustments informed by laboratory analysis of foods and supplements, and ongoing reference to updated husbandry guidelines and scholarly literature.

Emerging Research and Advancements

Emerging research and advancements in reptile nutritional science are refining best practices. Improved analytical techniques have allowed more accurate measurements of nutrient compositions in both wild and captive foods, informing better substitution strategies when native prey items are unavailable (Oonincx & Dierenfeld, 2012; Oonincx et al., 2015).

Captive breeding programmes in zoological institutions increasingly incorporate detailed nutritional protocols that are reviewed and adapted over time.

Field studies continue to illuminate the feeding behaviours and diets of wild populations, guiding the creation of more faithful analogues in captivity.

The interplay between diet, environmental management, and behavioural enrichment reflects a holistic perspective that recognises reptiles as complex organisms with intricate physiological and ecological needs.

Further Considerations

A key lesson in managing reptile nutrition in captivity is that it is not a static endeavour.

It requires ongoing dialogue between herpetologists, veterinarians, nutritionists, researchers, and keepers, as well as a willingness to reconsider long-held assumptions.

By blending current scientific knowledge with practical husbandry insights and by continually testing and refining feeding protocols, caretakers can approach the ideal of enabling reptiles to thrive rather than merely survive.

Continued progress in this field, supported by rigorous studies and the dissemination of new findings, promises more reliable, predictable outcomes—ultimately benefiting the reptiles themselves and advancing the standard of their long-term care.



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Earth and Respect for Its Inhabitants



Author
Professor Meera Deobhakta

Photos
Stock images

Introduction

Today, as I looked around at the surroundings, suddenly, something caught my focus, there, I found it! Serene, tender shoots making their grand entry into the world, all orchestrated by simple elements from Mother Nature.

Earth, Water, Sky (sunlight), Fire (warmth), and Wind (the breath of life) work hand in hand to produce new life.

I wonder if I am feeling this bolt of joy because I, too, am made of the same elements, both at philosophical and molecular levels. And the connection is easy to find. Each one of us, as human beings, has experienced this many times in our lives. It is written about in many

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faiths, using terms such as Mother Nature and Mother Earth, etc.

We see trees in full bloom, which not only give us beautiful flowers but also fruits. Nature is selfless and benevolent.

It teaches us many simple yet invaluable lessons. The ecological cycle shows us that all living creatures depend upon each other for survival.

Nature survives even despite destructive forces such as cyclones, forest fires and human greed.

We need to create a sensitive society that will bring harmony with Nature.

The Obvious Question

The obvious question that comes to mind is, why should we care for the Earth?

We, humans, take the wild creature's habitats and develop sprawling cities regardless of the destruction of nature that it entails.

When temperatures rise, tsunamis occur, and storms and floods destroy cities. Sea water encroaches on villages and townships, thousands of lives - humans, animals, birds, marine life, trees, etc - are destroyed, and then we face sorrow and unhappiness.

If we plan human habitats using sustainable planning practices, that will be **'Real Progress'**. Our ecosystem is a complex and adaptive system. It has interconnected elements upon which the survival of all species depends.

Ancient Philosophies

Let us consider how Nature is looked at in many of the ancient philosophies of the world. The symbolic meanings of natural elements form a basis by which Nature is represented as a cosmic ideal. The Indian tradition is cosmo-centric, whereby man lives as a part of the ecosystem, and all components are dependent on each other.

Creation, rejuvenation, and destruction all happen simultaneously. All matter is arranged in a correct, precise order in every living being.

Tao is a Chinese philosophy that encompasses and signifies the primordial nature of the universe. It respects all laws of Nature. These were a part of most ancient religions and beliefs. Tao is the absolute principle underlining the universe, combining within itself the principle of 'Yin and Yang'. It signifies a way of living within the natural order.





Throughout Indian history, people had respect for Nature's creations. Our ancestors worshipped rivers, animals, trees, etc. We symbolised some animals as God's charioteers and companions. Even the smallest and most insignificant animals were protected in this manner.

There was a belief that humans were but one link in the symbiotic chain of life and consciousness. Nature was never considered a hostile element to be conquered.

Children were taught to recognise the divinity that prevails in all parts of Nature - rivers, oceans, forests, hills, birds, butterflies. All life on Earth in ancient literature is seen as a manifestation of God and, therefore, was highly respected. Dr Pankaj Jain, Asst. Professor of South Asian Religion and Ecology at the University of North Texas has the following to say.

'The five elements- Space, Air, Fire, Water and Earth are the foundation of an interconnected web of life.'

Simple living is a model for the development of sustainable economy.' The belief in Prakuti, the primal energy/form of all things, is also seen in Greek mythology.

The ancient Greeks also worshipped the elements - Sun, Moon, Earth, water, etc

The following is a quote (slightly edited) from *Hinduism Today* July-August 2017 and is relevant to my commentary above: 'An Indian person's relationship with Nature differs from that of a Western person's. In the West, humans have separated themselves from Nature, believing they have mastered it and can use it to serve their own purposes. Love of animals and Nature in the West is a personal attitude, not a natural law'.

As the curtain on the new millennium rises, the drama of life and humans seems tragic.

More than six billion people are on a march of materialism, which means that acquisition, accumulation, possession and consumption of material goods is the ultimate 'good' in life. This philosophy assumes that the material resources are unlimited.

Human beings are proliferating at the rate of eighty million every year, and ninety per cent of this growth is in the developing world. There almost four out of ten people live at the edge of survival.

The Earth is endangered, according to a warning from the Union of Concerned Scientists issued in December 1992. Their declared report states that:

'Most biological systems, which have sustained life on this planet for millions of years, will collapse sometime during the early part of the next century. Everywhere, the human spirit is in revolt. Extinction cannot be the future of this beautiful Earth.

The perversion of technological systems must be challenged – a society on the march towards doom must accept the wisdom of the ancient that all life is sacred and its existence rests on the harmony established by evolution in the total scheme of life.'

This report of Concerned Scientists was published twenty-seven years ago. We must consider this introspectively to see how much Nature has been degraded.

Some of the Issues Facing the Planet

The effects of Climate Change and Global Warming are increasing in number and magnitude.

The average temperature of the Earth since the mid-20th century is soaring everywhere.

It continues to increase day by day, resulting in changes in several aspects of the environment and the Earth's surface. Arctic ice is now rapidly melting. Record high temperatures are being recorded all over the world. Climate change is the biggest environmental

challenge we are facing today. It has brought into focus the need for a political will for action. Countries have now rightly recognised our 'Atmosphere' as a natural resource. There have been some steps taken for energy conservation by every nation to do their bit to curb climate change. More serious efforts are needed to be taken by not only the Governments but by society as a whole as well.

Water is another key resource that is now under threat. Climate change is causing erratic rains, droughts and melting glaciers. The distribution of water is not equitable. With the increase in population, rampant growth of cities, etc., increased demand for water has caused a huge stress on existing water sources.

Rivers, lakes and other water bodies are running dry. India currently ranks 6th in the depletion of freshwater worldwide. Waste generated by humans going into water resources makes the water highly contaminated and unfit for consumption.

Countries need the political will to implement measures like rainwater harvesting and groundwater re-charging. In India, the efforts of successive Governments to clean rivers like the Ganges have not yielded great results.

Our seas are becoming highly polluted with plastic and other non-biodegradable materials, resulting in the loss of marine life. Dumping of waste in any water body must become a criminally punishable offence.

The land is one of the most important natural resources. It provides us with our basic needs. It is the habitat for all living creatures, including humans.

Twenty-three percent of the world's land area is affected by degradation; we are destroying woodlands and forests at a very rapid rate.

This creates problems like loss of biodiversity, depletion of groundwater, and increase in pollution, leading to extinction of species.

Wetlands support a range of ecosystem services like storm protection, flood control, and water filtration, which benefits humanity.

They support a high concentration of different species. About half of the world's wetlands have been destroyed due to urban expansion.

As per a BNHS study, Mumbai and Thane have lost forty percent of their wetlands to development projects. Even the wetlands that remain are being lost further.

Final Remarks

As per the recent Living Planet report, eighty-one percent of freshwater life, forty percent of marine life, thirty-eight per cent of terrestrial species and forty-one percent of tropical forest species have declined in the last forty-two years.

This, indeed, is a grim scenario. Unless all stakeholders take urgent steps to stem the rot immediately, life for all inhabitants of this earth will become impossible to sustain.

References

Futures of Relevance – Chapter 18





Why Zoos Must Embrace Technology for Better Nutrition Management

Author
Subhash Gounder
Photos
LSeT



Feeding animals in a zoo is far from simple. **Every species has unique dietary needs** based on factors including age, health, activity levels, and even seasonal changes. Managing these requirements accurately is essential, but traditional methods often fall short.

This is where modern technology, especially advanced software, can transform how zoos manage animal nutrition.

Challenges in Zoo Nutrition

Zoos house a wide variety of animals, from herbivores to carnivores, each requiring specific diets. A small error—such as incorrect food portions or missed feeding schedules—can seriously affect an animal’s health.

When this process is managed manually, even experienced teams can struggle with record-keeping, meal preparation, and tracking diet changes. This creates a critical need for a more efficient and precise system.

How Modern Software Can Help

Modern zoo nutrition management software offers a centralised platform that simplifies every step of the feeding process. Here's how:

Accurate Meal Planning

The software keeps a digital record of each animal's dietary needs, automatically generating precise meal plans. For example, if a tiger's weight increases, the system can adjust its protein intake accordingly without human error.

Automated Tracking

The system tracks feeding times, food portions, and any changes in dietary patterns. If an animal skips a meal or shows unusual eating behaviour, the software sends an alert, enabling keepers to act quickly.

Health Integration

Modern software can integrate with veterinary systems, making it easier to adjust diets after medical check-ups. For example, if a bird recovers from an illness, its meal plan can be adjusted to help regain its strength.

Inventory Management

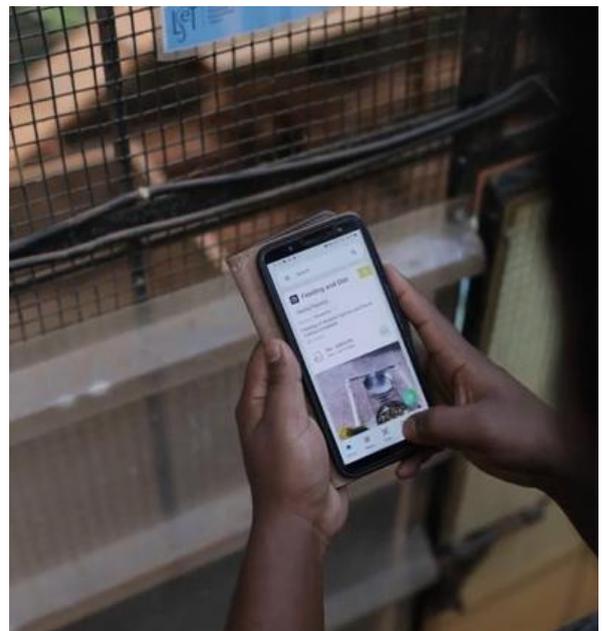
Keeping track of food supplies is another major task. A good software system can monitor stock levels and alert staff when supplies are low, ensuring the kitchen never runs out of essential ingredients.

Looking Ahead

Some zoos have already adopted such technologies, while others still rely on traditional methods. As expectations for animal welfare rise, using advanced software is no longer just an option.... it's a necessity.

With automated meal plans, accurate records, and timely alerts, zoos can ensure animals receive the right food at the right time.

Adopting modern software means fewer mistakes, healthier animals, and more efficient zookeeper operations. It's time for zoos to embrace technology—not just for convenience but to create a healthier and more sustainable future for the animals in their care.



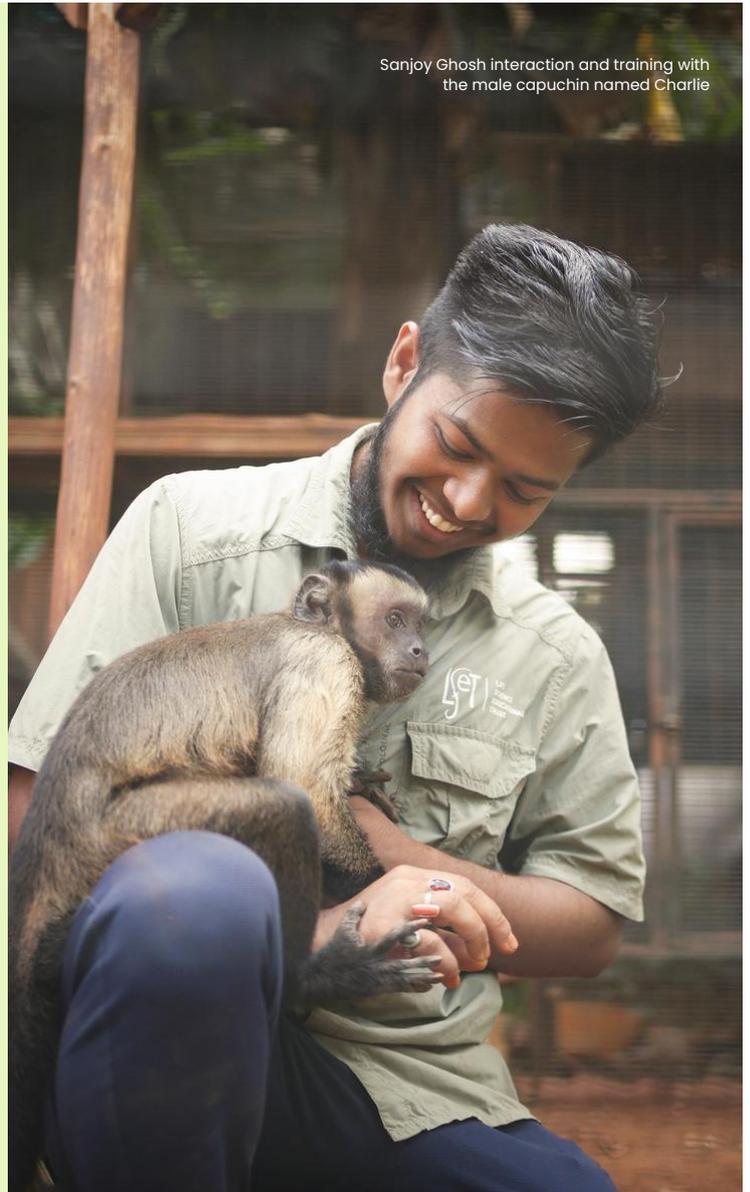
Student corner

The Art of Target Training

Unlocking the Potential of **Brown Capuchin Monkeys**

Author
Sanjoy Ghosh
Photos
LSeT

Sanjoy Ghosh interaction and training with the male capuchin named Charlie



Introduction

Target training establishes clear communication between the animal and the trainer. Target training is an essential tool in animal care and behaviour management, and it plays a vital role in enhancing the welfare of the Brown Capuchins *Sapajus apella* at LSeT.

These highly intelligent and curious primates thrive in environments where they are mentally and physically engaged, making target training an ideal activity for their development.

What is Target Training?

Target training is a type of positive reinforcement training that focuses on building trust, respect, and clear communication between humans and animals.

Why Target Training?

Target training helps in building trust between the animal and the trainer, promoting cooperation during health checks, weight monitoring, or enclosure transitions. It reduces the need for physical restraint, minimising stress for both the animal and the keeper.



Training Process

Name Training

A name must be chosen for the animal before commencing target training. This is necessary to enable the animal to recognise and understand when you are calling it and to familiarise it with your voice. It is important to choose a name that is simple but unique, as this will make it easier for the animal to learn and understand. Choosing a long name or one that is similar to that of another animal nearby will cause confusion.

Verbal Encouragement

During target training, every time the animal touches the target, it is essential to signify this with encouraging vocalisation, for example, by offering a cheerful 'Good boy' or 'Good girl', as this enables the animal to recognise that it has achieved the goal. The animal will

then understand that this part of the training is over and that it will now receive its reward.

The right time of the day

When it comes to target training a monkey and other animals, no doubt, the time that training takes place plays a big role in the overall success achieved. It is vital to perform the training at around the same time each day and equally important to do so for roughly the same length of time each day. It is also essential to limit the amount of time spent on each training session to a manageable length to ensure that it does not become too much for the animal, as over-training can have a very negative impact on the effectiveness of the training.

We must also be aware of and take into consideration the environmental conditions each day, as excessive heat, rain or cold, or the presence of a predator in the vicinity of the enclosure will certainly affect the animal's willingness to train.

It is also important to set a time for training that does not coincide with feeding time. I have found that the best times to perform target training with the Brown Capuchins are between 9 am to 11 am and 2 pm to 4 pm. I train each Capuchin for no more than 10-15 minutes per session, twice per day.

How to use a training stick

A training stick is an important tool for target training, for the Capuchins, I use one that is slightly different to the standard type employed for target training - one end of the stick has a coloured ball attached, and the other end is wrapped in coloured tape.

To successfully conduct target training activities, it is very important to first familiarise the animal with the training stick. The animal's behaviour should be carefully observed when the stick is brought close to it.

At first, the stick should be placed nearby, and the animal should be given enough time to spontaneously show interest in it. This process should be conducted repeatedly so that the animal understands that the presence of the stick is not a danger to it but can, however, be a means of earning a reward.

Reward time

If the animal touches the stick or approaches it, it should be rewarded immediately. This reward can be its favourite food, such as a small piece of fruit or a nut, for example. By receiving repeated rewards for this task, the animal's interest will increase.

Correct Training Technique

Target training is a valuable tool to use in animal care, particularly with more intelligent species like Capuchin Monkeys.

Employing a correct training technique is very important. It involves teaching the monkeys to touch or follow a specific object, such as a ball or stick, known as the 'target', in exchange for a reward.

It is widely used to improve animal welfare, simplify routine care, and foster trust between animals and keepers.

The training begins with introducing the target, usually a brightly coloured stick or ball. The monkey is rewarded with a favourite treat for any interaction with the object, such as touching it with their hand or nose.

Over time, they associate the target with positive outcomes. Gradually, the monkey is guided to perform specific behaviours, such as moving to a certain spot or presenting a body part for inspection.

Regular reinforcement ensures these behaviours are retained and refined.



Benefits of Target Training

Target training offers numerous benefits. It facilitates stress-free veterinary care, enabling keepers and veterinary staff to conduct health checks or administer treatments without causing distress.

It also provides mental enrichment, keeping the animals, in this case, the intelligent Capuchins, engaged and preventing boredom.

Additionally, this method is highly effective for guiding monkeys to move between enclosures or into transport carriers, reducing the need for forceful interventions.

Conclusion

Remember that target training is not just a process but a journey built on trust, respect, and mutual understanding.

Each small step strengthens the bond between the trainer and the animal, paving the way for a deeper, more meaningful connection.

Through patience and care, we can create a foundation for a brighter, more harmonious future together where both the animal and the keeper thrive.







Diploma Dreams Delivered

LSeT marked a proud moment with the certificate distribution ceremony for our first-ever Diploma batch, a significant step forward for our students and the institution.

Heartfelt congratulations! to all our dedicated graduates! Their perseverance and passion have set a strong foundation for future learners and inspired the LSeT community to continue striving for excellence in animal care and education.



Welcoming the next generation of wildlife enthusiasts



Dinesh Dewasi

Bringing experience from the pharmaceutical industry and a background as a B.A. graduate, Dinesh is eager to grow, learn, and embrace new challenges. With analytical skills, dedication, and a strong commitment to personal and professional development, he looks forward to making meaningful contributions in this new journey.



Rameshwar

With a strong academic foundation, Rameshwar will be a valuable addition to the LSeT family. Having completed 12th and currently pursuing a Bachelor's degree, he brings enthusiasm, curiosity, and a commitment to learning. His fresh perspective and dedication will be valuable assets in this new journey.



Nysa

Bringing both creativity and analytical skills, Nysa has experience in event planning and production, along with a strong academic background in Chemistry and Zoology. Nysa's adaptability, enthusiasm, and attention to detail makes her a valuable member, ready to embrace fresh challenges and contribute meaningfully to this journey.



Anjali

With a deep passion for zoology and hands-on experience in animal welfare, Anjali brings both knowledge and dedication to her journey. Having completed an internship at People for Animals Bangalore, she is eager to apply her skills, expand her understanding, and make a meaningful impact in her new role.



Dinesh Kumar

With hands-on experience in social initiatives and animal welfare, Dinesh has worked with the Prashant Advait Foundation and volunteered at Peepal Farm in Himachal. His dedication to meaningful work, combined with a strong sense of compassion, makes him an eager learner ready to embrace new challenges ahead.

LSeT Events: Where Knowledge Meets Action

Beyond classrooms and labs, LSeT thrives in the real world – through conferences, expos, and hands-on learning. This section highlights our participation in some exciting events and experiential training sessions.

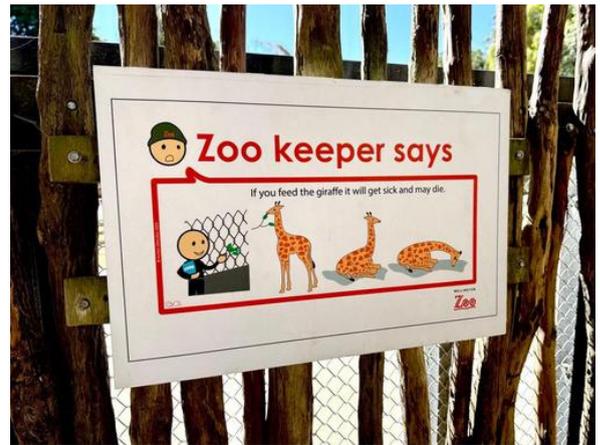
Celebrating Pet Culture at PetFed Bengaluru

LSeT joined the fun and furry fest at PetFed 2024, held on December 7th & 8th at Jaymahal Palace, Bengaluru. The vibrant festival provided a unique opportunity to engage with pet enthusiasts, share our initiatives, and promote responsible pet care and welfare.



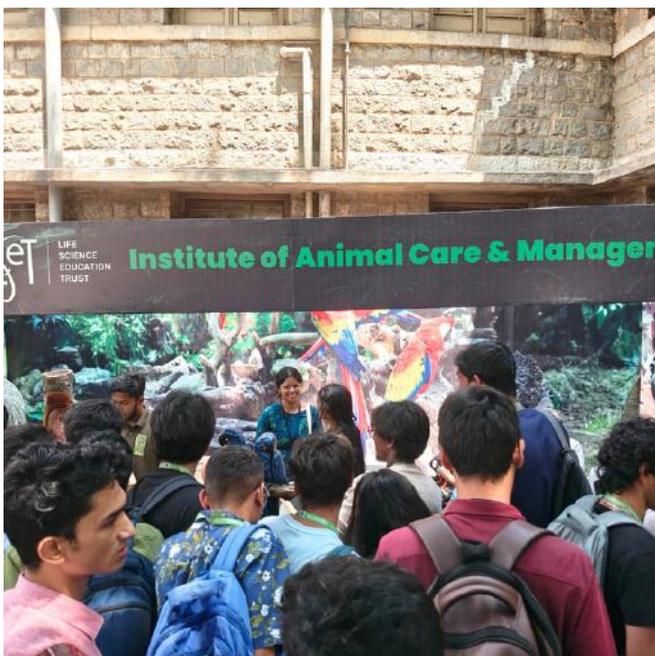
Exploring New Frontiers in Animal Care at ICZ

An enriching experience at the **8th International ICZ** by **Mr. Simon Degenhard**, where our passion for animal welfare meets innovation and learning! From engaging discussions to hands-on interactions, this event showcased the best practices in animal care and management* Together, we are shaping a future where animals thrive in compassionate and well-managed environments.



LSeT at NCTTZS 2025 – Shaping the Future of Zoological Sciences

LSeT Foundation proudly participated in the National Conference on Trends and Transcends in Zoological Sciences (NCTTZS) at St. Joseph's University, Bangalore. The event brought together pioneering researchers, educators, and industry leaders to exchange ideas and explore innovations in biodiversity, conservation, and zoological sciences. Our collaboration with St. Joseph's College, Bangalore, reaffirmed our commitment to academic excellence and forward-thinking research.



LSeT at the Ethnological Society of India Conference – Reva University

LSeT participated in the Ethnological Society of India Conference at **Reva University** on **April 22–23, 2025**. The event featured vibrant discussions, curious student interactions, and a lively stall reflecting our passion for animal care and education.



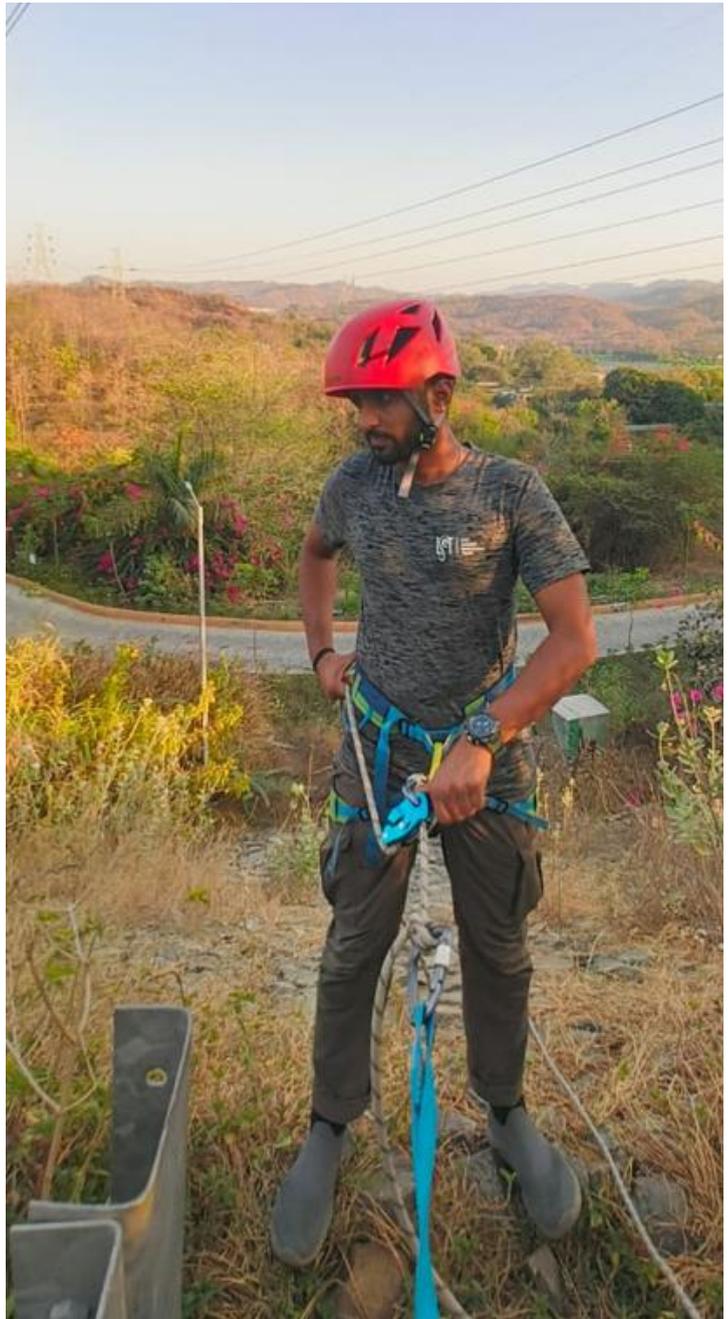
Showcasing Innovation at IoTshow 2025

From February 26 to 28, 2025, LSeT made its mark at the prestigious **IoTshow at KTPO Trade Center, Bengaluru**. The event was a convergence of IoT and AIoT innovators, and LSeT's presence—led by Mr. Arun and team—highlighted our drive to embrace emerging tech for the betterment of animal care, research, and habitat management.



Scaling New Heights: Adventure Training with Krunal Trivedi

Adventure met education in a hands-on session led by Mr. Krunal Trivedi, where students were introduced to the world of mountaineering techniques. From rappelling to jumaring, the workshop offered practical exposure to safety gear and climbing skills, adding a thrill to the learning experience.



LSeT Workshops & Webinars

A glimpse into our expert-led learning sessions.

Webinars



Exploring Chalcopsitta & Charmosyna

(February 27, 2025)

In an insightful webinar, **Lubos Tomiska** took us on a journey into the world of these vibrant parrot species, highlighting their behaviors, habitats, and conservation needs.



The Return of the Spix's Macaw to the Skies of the Caatinga

(March 22, 2025)

A special online session with **Mr. Simon Degenhard**, shedding light on conservation efforts to reintroduce the Spix's Macaw to the Caatinga.



Breeding of Toucans

(April 4, 2025)

Mr. Mark de Klein from the Netherlands brought valuable insights into the world of aviculture, sharing expert knowledge on the breeding practices of Toucans and other softbills.

Workshops



Workshop on Discus Fish

(September 17, 2024)

Mr. Sanjay Khandagle shared best practices for feeding and keeping discus fish, helping enthusiasts master the care of this stunning species.



Workshop on Shrimps

(December 14, 2024)

Mr. Abhisek Mallick (Blue Vale Lifetech - Shrimpytrade) provided insights into optimal water parameters, breeding strategies, and shrimp health.



Workshop on Primates

(January 14, 2025)

Douglas Richardson, a global zoological and conservation consultant, conducted an in-depth session on caring for these fascinating primates.



The World of Canaries

(February 19, 2025)

In this insightful workshop **Mr. Chandrahas Rajda** covered feeding, health management, breeding techniques, and ideal habitat setup for canaries.



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