

SAZARC News -- Tasks given for SAZARC Conference Training on Nutrition and Zoo Population Management

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Topic 1 : NUTRITION

Last year at SAZARC we all decided to pool information to prepare a Handbook on South Asian Zoo Nutrition. This will also help us prepare for Part II : Nutrition – South Asian Zoo Nutrition Handbook. Several animals were prioritized and these are listed here with information that is required for the handbook and the meeting. **DO NOT GET DISCOURAGED IF YOU CAN'T SUPPLY ALL INFORMATION – DO YOUR BEST AND LEAVE THE REST !**

1. Carnivores: need detailed instructions in hand-rearing tigers, lions, bears, wolves.

Ideally these instructions should be from your experience but we will accept that of other colleagues if you have no experience. These instructions should include :

- i. all food items/mineral powders, etc. used, ii. amounts fed, iii. feeding utensils, iv. environmental conditions, v. sanitation procedures, vi. growth charts. Vii. records you may have of weight gains/growth mother-reared cubs in your zoo

Working Group assignment at meeting: This handrearing information will be added to generic data compiled in 2003 for tiger cubs, and all will be summarized for implementation in feeding programs.

Also, diets will be evaluated for the following native species as decided by you last meeting: tiger, leopard, rusty spotted cat, python, and pelican. Information collated for at least 5 separate collections is required so everyone should contribute what you can. On the basis of what is collected a report will be made for the handbook. A full citation list based up available natural history and health literature citations will be included

2. Herbivores' browse – compiled lists of the scientific names and chemical analyses if available of the following

- i. all browses (trees, native or fresh plant materials) fed at your facility,

- ii. any laboratory analyses that exist for these important feeds. (either published values, with full citation or laboratory report on nutrients from samples you have submitted)
- iii. Minimal nutritional information would include water, protein, fiber, fat, and ash content. Mineral analyses also can be included.

Working Group assignment at meeting : The WG will be charged with compiling nutrient data on various manufactured dietary products (pellets, locally available grains, as well as a list) of native browses and trees fed to various species in your zoo.

[Browses identified in 2003 included: *Ficus* species; Coconut leaf; Jak (*Artocarpus*); Palm (*Caryota*); Banana leaf, fruit, stem; *Acacia*; Bamboo; Green leaves; Maize leaves; Para grass; Raw rice (green), grain; Salad leaves; Sugar cane. Information from regional laboratories desired.

3. Primates: detailed information on diets fed to macaques and langurs at your facility (past 3 years) i. you should identify species/subspecies, types and amounts of foods,

and breeding records for the past 3 years

- ii. send information from local literature regarding natural history information on feeding for macaques and langurs (seasonal diet choices, native foods).

Working group assignment at meeting : The group will then design a study of dispersal of food resources and feeding behaviours in the wild so that the nutritional status of macaques and langurs in our region (blood values, body condition indices, etc.) can be assessed. A regional lab should be identified to evaluate native feedstuffs.

5. Elephants: Detailed information on elephant diets used at your facility. To include hand-rearing diets and different diets for growing, lactating, and geriatric animals. Most needed for accurate diet evaluation is nutrient comparison of local grains and forages used in the feeding programs – nutritional analysis of red rice, for example, compared to white rice.

Working Group assignment at meeting : Summaries of all such diets will be compiled and compared with programs at Pinnewala Elephant Orphanage, and Western zoos.

Topic 2: POPULATION MANAGEMENT

1. As an exercise we will put together a regional studbook for Sloth bear. It is the animal in our logo and almost the only animal which is held by all South Asian countries zoos and which has a historical or current range in all the countries. For this we need pedigree information for all of your sloth bears. Try and collect even for zoos which are not going to attend. Contact Sally Walker at her email <zooreach@vsnl.com> for a form to fill the information.

This form should be filled for each individual bear. Send this information to Sally Walker if you are from Bhutan, Afghanistan, Sri Lanka or Nepal and to your country coordinator if you are from Pakistan, Bangladesh or India.

If the meeting agrees, we will start a genuine regional cooperative conservation breeding programme for Sloth bear. These animals will be much in demand by zoos outside the region and may lead to interesting animal exchanges in future.

2. Think of species which are important for conservation breeding in your zoos ... these should be species which are native to this region – South Asia and to your country – not species from Australia, Africa, etc.

Suggest at least 3 species of mammals, 3 reptile species and 3 bird species which you have in your zoo and which could be a candidate for regional cooperative breeding programmes. Out of those we should collaboratively select one from each taxon group to consider for discussion next year. Bring individual animal information for these animals if possible.

3. Send your updated stock lists as usual but this year we want you to bring more information on individuals, such as their birth dates, origin, etc.



Bangladesh -- first to complete Task for SAZARC Nutrition and Zoo Population Management Training 2004

Topic 1: Nutrition

1. Carnivores:

i & ii) Food items and amounts fed per capita:

Tiger		Lion		Bear	
Beef	12 kg/d	Beef	10 kg/d	Bread	250 g/d
Eggs	1 /d	Eggs	1 /d	Ripe banana	2 kg/d
Orange	1 /d	Orange	1 /d	Egg	1 /d
Chicken	1 kg/wk	Chicken	1 kg/wk	Vegetables	2 kg/d
Liver	250 g/wk	Liver	250 g/wk	Rice	0.5 kg
Vit-min premix	10 g/d	Vit-min premix	10 g/d	Milk	0.5 L/d

Vit-min premix (Renavit DB) contains: Vit A 1000000 IU; Vit D₃ 100000 IU; Vit E 10g; Cobalt 0.8g; Copper 6g; Iron 80g Iodine 2.5g; Manganese 50g ; Magnesium 100g; Selenium 0.1g, Zink 45g.

iii) Feeding Utensils: Wooden flat utensils are usually used to provide foods for the tigers and lions. The size of utensils measuring 3.5' x 2' x 3" and 4' x 2.5' x 1' approximately. But for the bears feeder is made of brick-cement measuring about at the premise.

iv) Environmental Conditions: Lion and Tiger moat are situated beside the lake at the north side of the zoo. A moat is almost round shaped with the area of about 5! acres wherein a water channel is encircled along the periphery of the premise. This facility is usually provided for dipping or swimming of the tigers/lions. During the summer, cool air from lakes, shades from the premise trees and water channel simultaneously facilitates to resist animals from the high temperature and low humidity. From their attitudes it is perceived that they are in more comfortable conditions than that of normal enclosure. It can be mentioned that all tigers and lions are existing in normal enclosures except 2 moats.

v) Sanitation Procedure: For this purpose, according to daily routine floor of the sheds is manually cleaned properly once a day. Iosan is also used occasionally as a disinfectant if required . And phenyl is applied seldom outside the sheds.

Elephants Diets		
Items	Amt.(kg/d/animal)	Comments
Banana tree leaves	150	
Maize plants	125	
Banana	10	
Pakur tree leaves	30	
Vegetables	15	
Gram	5	Recently introduced to prevent hypoteinae
Sugarcane	50	seasonal

Primates: Diets fed to Macaques and Langurs												
Taxon	Local Name	# ani	Bread (g)	Ground nut (g)	Apple (g)	Orange Malta	Mango (g)	Banana (g)	Eggs No.	Gram (g)	Vegs (g)	Pinea pp.(g)
Pig tailed Macaque <i>Macaca nemestrina</i>	UI Banor	4	100	20	100		125	750	1	5	500	250
Bonnet Macque <i>Macaca radiate</i>	Bonnet Banor	2	100	20		15	125	500	1	5	500	250
Rhesus Macque <i>Macaca mulatto</i>	Rhesus Banor	36	100	20				750		20	500	
Capped Langur <i>Presbytis piletus</i>	Hanuman	6	100	20			125	750	1	50	500	250
Common Langur <i>Presbytis entellus</i>	White Hanuman	3	100	20			125	750	1	50	500	250

Herbivores' browse-compiled lists of the scientific names and chemical analyses (in percentage)												
Sl	Name	Scientific name	DM	CP	CF	EE	NFE	Ash	Ca	P	DCP	TDN
1	Maize plant	<i>Zea mays</i>	22.10	7.10	26.92	1.58	56.92	7.42	0.54	0.27	4.4	66
2	Napier grass	<i>Pennisetum purpureum</i>	19.71	10.19	33.03	2.38	43.28	11.11	0.46	0.30	6.3	55
3	Para grass	<i>Brachiaria mutica</i>	22.22	10.80	29.25	2.34	46.94	10.67	0.32	0.36	6.1	56
4	Baksha grass		23.09	9.01	31.75	2.04	44.74	12.47	0.39	0.26		
5	Roadside grass (mx)		20.75	4.60	36.83	2.13	43.04	13.40	0.48	0.05	2.7	56
6	Haicha	<i>Alternanthera sessilis</i>	9.0	22.1	20.4	10.1	27.1	19.9				
7	Pakur leaves	<i>Ficus infectoria</i>	18.2	11.2	27.2	2.2	51.3	7.7				
8	Banyan tree leaves	<i>Ficus bengalensis</i>	27.2	10.55	22.54	2.98	50.14	13.79	1.51	0.15	2.1	43
9	Banana leaves	<i>Musa sapientum</i>	19.0	10.03	20.95	5.53	51.33	12.16	1.26	0.27		
10	Puin shak	<i>Basella rubra</i>	9.30	23.66	17.96	2.26	39.78	16.34	1.29	0.75		
11	Spinach	<i>Spinacia oleracea</i>	7.90	30.75	10.13	2.91	34.56	21.65	1.39	0.38		
12	Lal shak	<i>Amaranthus mangostanus</i>	10.02	33.03	12.77	4.89	30.25	19.06	2.60	0.40		
13	Cabbage	<i>Brassica oleracea var capitata</i>	10.70	20.84	12.15	2.15	51.68	13.18	0.56	0.37	14.4	67
14	Sugarcane tops	<i>Saccharum officinarum</i>	27.09	5.61	33.30	1.70	53.45	5.49	0.52	0.22	2.7	56
15	Gram	<i>Cicer arietinum</i>	91.71	21.97	10.06	2.95	61.75	3.27	0.24	0.40	14.5	84
16	Rice	<i>Oryza sativam</i>	89.03	9.10	1.03	1.38	87.37	1.12	0.06	0.27	6.8	80
17	Wheat	<i>Triticum</i>	89.40	14.32	3.37	1.79	78.37	2.15	0.09	0.49	11.2	88

**Bhutan ! -- Second to complete their SAZARC task :
Wildlife Rescue Centre/ Breeding Centre**

Phuentsholing Territorial Range, Gedu Forest Division, Bhutan
Phone No. 00975-5-252322 (o), Fax No.253094 (near our office)

	Name of animal	# / sex ratio	Diet	Where acquired
1	Alligator	3.3	Fish-12kgs on alternative day	Purchase from Meat store
2	Crocodile	n/g	Beef-30kgs every after 3 days	Purchase from Meat store
3	Peafowl Peahen- 8 Peacock-3	3.8	2kgs Wheat, maize and other grains (mixed)	Purchase from Feed Store
4	Barking deer Female- 1 Male- 2	2.1	4kgs of mixed wheat and maize floor	Purchase from Feed Store
5	Fishes – local names Masheer and katley	60-70	1kg wheat floor every day	Purchase from market

**Sri Lanka ! -- Third to complete their SAZARC task :
National Zoo and Pinnewala Elephant Orphanage**

At the Colombo zoo there are no records available with regard to hand rearing of tiger and jaguar cubs. But long ago two tigers were brought up by giving milk from a lactating bitch. They are now being exhibited.

Last year there was one birth of a bear cub and the mother rejected it. Then it was introduced to a lactating bitch but died due to getting over fed. A month ago the same bear delivered two cubs and they are still with the mother and not being exhibited.

We have records of hand rearing of fishing cat kittens. (but only up to 3 weeks). The photographs of the feeding bottles (not included here) and details of the milk formulae used, are given below.

NUTRI-LAC

For animal treatment only. Aristopet is a balanced nutritional supplement for puppies, kittens, dogs & cats. 300gms at a cost of Sri Lankan Rs.900/-. This contains fully digestible levels of carbohydrates, proteins, fats with vitamins and minerals. It has no malto dextrins sucrose or soy proteins. It is suitable for puppies with lactose intolerance.

Typical analysis

Proteins	24%
Lipid	30%
Carbohydrates	30%
Energy	2224Kj/100gms 450Kj/100ml

Vitamins and mineral content per liter of prepared solution

Ascorbic acid	50mg
Thiamine	1mg
Riboflavin	2
Nicotinic acid	50mg
Pantothenic acid	10
Pyridoxine	1.5
Folic acid	0.4
Cyanocobalamine	0.04
Biotin	0.06
Retinol	0.8
Di-alpha-tocopheryl	4
Colicalciferol	0.01
Phytomenadione(vit K1)	0.05mg
Inositol	3
Calcium	20
Phosperous	1.5
Sodium	1.0
Potassium	0.8
Citrate	0.5
Magnesium	0.1
Iron	200
Copper	5
Zinc	5
Manganese	1
Iodine	0.15

Preparation

Add 2scoops of powder (24gms) to a container. Mix into a thick paste by adding warm water. Then add warm water to make up to 100ml

Approximate feeding schedule

Body wt in mg	100	200	300	400	500	600	700	800	1000
Vol. of formula in ml	15	30	45	60	75	90	105	120	150

Browse at NZG, Sri Lanka

NZG Sri Lanka has prepared a table of the values of their array of browse, but it is complicated to reproduce in ZP. Please accept a list of browse used by NZG.

1. Jak (*Artocarpus heterophyllus*)
2. Nuga (Heen Nuga)- leaves
3. Athikka
4. Letta Kochcha
5. Bo
6. Breadfruit (*Artocarpus communis*)
7. Tamarindb(leaves & stems) 70 (*Tamarindus indica*)
8. Amberrella (*Spondias cytherea, S.dulcis*)
9. Erabudu (*Erythrina*)
10. Bilin (*Averrhoa bilimbi*)
11. Ahatu
12. Pota val (leaves & stems)
13. Goraka
15. Kithul leaves
16. Albizia
17. Giricidia
18. Ipil ipil(leaflets) (leaves & twigs)
19. Sugar cane (tops)

3/4, Kingsward Smith Drive, Eagle Farm, Qld. 4009

www.aristopet.com.au

Royal canin -1st age milk

Complete lactation milkbirth – weaning

Ingredients –milk proteins, animal fat, whey proteins, vegetable oils, fish oil, minerals, lecithin, fructo-oligo saccharides, trace elements, DL-methionine, taurine, vitamins, aroma

Average analysis

Proteins	33%
Fat	39%
Ash	6%
Fibre	0%
Moisture	3%
Calcium	1.1%
Phosphorous	0.8%
Sodium	0.3%
Magnesium	0.06%

Vitamins per Kg

A	25000µ
D3	1500µ
E	600mg
B1	20mg
Taurine	0.25%

Trace elements per Kg

Copper	1.5mg
Iron	100mg
Mangqanese	80mg
Zinc	230mg

EC permitted preservatives and antioxidants

Vitamins level guaranteed until best before date as printed at the pack

Crown Pet Food Ltd, 25, Brympton way, Yeavil, Somerset BA 20 21B, www.royalcanin.co.uk

Still waiting !

We are still waiting for India (except Nandankanan Zoo) Pakistan and Nepal to complete their tasks. Pakistan can be excused for now because they got left out of the mailing. However by the time this issue appears, they will have received it.

The zoos that have received their task but not sent information are :

Kamla Nehru Zoo, Kankaria
Maitri Baug Zoo, Bhilai
National Zoo, New Delhi
Lucknow Zoo, Lucknow
Chamarajendra Zoological Gardens, Mysore
and a few others. We regret that we cannot invite all zoos the SAZARC due to funding constraints, etc.

Central Zoo, Kathmandu, Nepal