

## Bio-security Guidelines Working Group

### Bangladesh group

General Bio-security Guidelines for Dhaka Zoo  
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#### Definition

Biosecurity is a "buzz word" meaning management practises designed to minimize the risk of introducing infectious diseases into an animal population.

#### Purpose

Biosecurity is an approach to preventing and managing infectious diseases that could threaten the health of animals, employees, guests and visitors. This is a document to be followed by employees, guests, visitors and contractors that work with and around the animals on the premises.

A) Monitoring and supervising chief - Director General, DLS

B) Implementing authority:

Curator, Deputy curator, Deputy curator (animal survey), Zoo officers, Information officer, Security officer, Administrative officer, Nutrition officer, Veterinary surgeon, Scientific officer, Museum in-charge, Estate officer.



Bangladesh group was mostly veterinarians and made an outstanding set of guidelines for Dhaka Zoo

#### General Biosecurity Measures:

1. Animal waste: pollution, disease problem
2. Pollution: manure, odours, noise, feathers, dusty air, water runoff, insects, dead birds/animals, visitors refuse
3. Waste disposal: spreading on soil, dehydration by hydrators, composting, burning, lagoons, manure tank, bio-gas, digester, dried on sun, concentration or density of animals risk of disease disaster.

#### Preventive Measures

Site selection, adequacy of housing and equipments, buy certified animal/bird stock, immunization, elimination stress, adequate nutrition, preventive medication, animal placement and management care, health care personnel, avoid sites of cross infection, fence on perimeter, decontaminate staff, vehicles and zoo premises, sick animal/bird isolated regularly, protect zoo animals/birds from wild bird, animal and rodents, secure zoo premise during night, lorries load and unload from an out side area

#### Daily Biosecurity Measures/Activities Of Dhaka Zoo:

1. Entrance gate: foot bath, spray disinfectant
2. Animal area: use foot bath in entry and all enclosure, spray disinfectant, wash any contaminated area or waste, clean the premises.
3. Animal feed and storage: general food safety principals of bio-securities to be followed, uncooked whole egg products or containers will not enter in zoo premises, investigate food sources like meat (live animals), fish, fruits, vegetables, grass etc from possible contamination, nutrition department conduct site visit to vendors, follow the principle of HACCP (Hazard Analysis and Critical Control Points).
4. Working staff: employee preventive and occupational health care: officers, animal caretaker, visitors, all others employees'.
5. Wild and feral animals: minimize access of wild and feral animals around the enclosures, prevent fecal contamination from wild birds and other vermin, prevent standing water accumulation, follow protocols for handling dead animals/wildlife.
6. Routine surveillance: passive surveillance- timely investigation of unusual mortality events, monthly morbidity and mortality meetings to detect diseases strains, plans for avian influenza outbreaks control.
7. Biosecurity communications and evaluation: Public communication: curator will develop a public communication module that sets strategies and truth message to the media and community - Regulatory communication: curator will work with local and national regulatory officials - Employee and voluntary training: all employees will receive training on basic infection control and zoonosis on a regular basis.

#### India group

Group Members: J. Chauhan, K.B. Markandaiah, Karuna Priya, R.K. Sahu (Presenter), A. Anjankar

#### Disease Identification

1. Viral diseases: Avian influenza, FMD, Rinderpest, Rabies, Ranikhet, Feline distemper, Canine distemper
2. Bacterial Diseases: Anthrax, H.S. (Hemorrhagic Septicemia), Salmonella, Tuberculosis, Tetanus
3. Protozoan Diseases: Trypanosomiasis, Babesia, Malaria, Leptospirosis, Coccidiosis
4. Fungal Diseases: Gosipol poisoning.



The Indian group split in two sub-working groups for this topic

Preventive measures to be taken

Quarantine for new animals, isolation for sick animals, vaccination, disinfection (by chemical, by heat), animal keepers hygiene and periodical medical tests, proper procurement of feed, its treatment and storage, proper disposal of waste material (animal excreta and feed left over), safe drinking water, enclosure and feeding cell -- Potassium permanganate solution, application of turmeric powder, providing foot bath, installation of fly catchers and mosquito repellents, proper ventilation of feeding cells and storage facility, proper slope within feeding cells, providing fly proof mesh in feeding cells, proper drainage system, routine examination of animals proper disposal of dead animals

Nepal Group

Biosecurity Guidelines for Central Zoo

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General biosecurity measures taken

Facilities/ Enclosures

Unwanted entry of visitors in enclosures is discouraged. Daily cleaning of feces, urine and left over food and disposing it separate waste disposal pan. The waste is then separated into degradable and non degradable components. The degradable components are then composted. The non-degradable components is taken outside the zoo and taken care by waste management authority.



Nepal participants were from Central Zoo and a few of the small zoos in the country and wildlife areas

For cleaning: In concrete area, the waste is swept, it is brushed and flushed with water, disinfectants like Kohrsolin® used once a weekly, the ground feces are picked up, the upper soil is dug up regularly, on small cat enclosure, sand is placed at the end. Cat defecates on soil and it is easy to pick it up, in Rhino enclosure, that defecates in one place, lime spraying is done once the feces is taken out, regularly the wall, logs and wires are cleaned with water and painted with disinfectant, every year the zoo premises are painted. The inner wall is painted with lime, the lime is placed near the door as a foot bath.

Animal care staff

The zoo is divided into four sections with separate hospital and quarantine staff.

Each section has a head zoo keeper and assisted by three zoo keepers. Hospital and quarantine are cleaned by separate keeper.

The animal care staff (keepers, vets and curators) wash their hands often and specifically when arriving at work, before and after animal contact, between animal activities, before eating and before leaving work.

Every staff has separate uniform. They are provided with boots, gloves, and masks.

Staff are dewormed twice a year.

They are vaccinated against rabies.

TB testing of staff is planned in near future.

All staff has health insurance and they get reimbursed with their medical expenses.

Each unit has washbasin, towel and soap.

The staff clean the hand once they come to office.

After handling the dead animal, staff takes bath.

Collection of Animals

There is separate quarantine place and all incoming animals go for compulsory quarantine as required.

The domestic animals and pets are not allowed to enter the zoo.

In quarantine, fecal examination is done and preventive medical care is taken.

The small sick animals are placed in isolation room and taken care by separate staff. These staff do not look after the healthy animal in display.

After animal die, PM is done in separate place. The dead animal is buried by lime is sprayed during burial.

There is separate PM kit. They are cleaned and disinfected after use.

Animal feed

There is contract system for collecting feed. Grains and other non perishable feed are collected for a month. Fresh vegetable and fresh meat are supplied daily.

The feeds are inspected daily by a team lead by vet.

The vegetables and fruits are washed with potash water.

If the feed do not meet the criteria, they are discarded and zoo will buy itself. There will be penalty to contractors.

Wild and feral animal

Mice and mongoose is the most feral animal. Mice traps are used. In birds section, water is placed in enclosure and mice come out. They are killed then.

In hoofstocks enclosure, mice are killed by using chemical. For pigeons, traps are used.

Others

Every year there is zoo keeper's workshop and keeper are trained to take special care for biosecurity measure.

Each new staff and volunteer will receive special class on biosecurity measure

When students come for animal feeding program, special class is taken for them. They are provided separate apron, soap and water while working.

Biosecurity program of the central zoo is disseminated to students through conservation education department.

## Sri Lanka group

Bio security plans for National Zoo Sri Lanka

Group Members: D. Malsinghe, C. Denagama, C. Ganga Wijesinghe, P. De Zoysa. Presenter: Ganga Wijesinghe

### Goals

- To prevent disease introduction; to prevent disease spreading; to minimize the risk of zoonotic diseases



Sri Lanka's National Zoo has several veterinarians and is known for its excellent veterinary services.

### Risks

#### 1. Lot of feral animals

Enclosure designing

Maintenance of enclosures

Barriers to prevent animals entering into the zoo

Assign a security guard with a firearm to chase the feral birds during feeding times

#### 2. Rescue wild animals

Quarantine

Clinical examination – if required euthanize and further investigations

#### 3. Feed items

Accept only feed fit for human consumption

Accept only certified meat

Purchase from reputed ISO standard farms

Separate area for preparation - restricted area

Daily inspection of meat quality

Random samples for lab investigation

Live chicken: separate area for receiving and slaughtering, anti-mortem inspection, PM inspection, communicate with the veterinarian in charge of the farm

#### 4. Public interactions

Visitor barriers

Signage

Announcements

#### 5. Animal keepers

Early identification of diseases

Record keeping

Hygiene

Routine health checks

## Afghanistan Bhutan and Pakistan group

Emerging diseases Bio security for Afghanistan, Bhutan and Pakistan

Group Members: Aziz Gul Saqib (Presenter), Mahtabudin Ahmadi, Rahila Kohistani, A Qader Bhawi, Najib Nazary, M Mansoor Qazi, Kuenzang Gyeltshen

Bio security: Minimize the risk of introducing an infectious disease into animal population. and control of disease when it occurs.

### Animal Care Staff and Facilities

Complete health screening of staff related to animal care twice in a year, e.g. TB, hepatitis, parasites; resources provided by zoo; uniforms – 3 sets each, good shoes, gloves; hygiene practices. e.g. hand washing, shower regularly, etc.; Foot baths with disinfectant; separate keepers for different areas; female keepers who may be pregnant will not be assigned to felines; keepers injured by animals – will have health treatment/testing done; tools – separate for area, keep clean; pest control – flies, rodents, birds, etc.; areas must be painted to avoid rusting, etc. (lime painting/white washing and oil painting of metals); proper disposal of fecal material & old feed (meat, etc.); signage – encourage good visitor behavior (e.g. no spitting at animals).

### Food Quality

Establish standards of quality of food, Communicate to suppliers – standards of quality, Fresh supply of everyday for meat, vegetables/fruit, fish; Monthly supply of dry feeds; Feeding table for animal and feed supplementation; Feed provided on clean/cleanable table/ surface; Set time of feed provision. Remove after to avoid spoiling; Remove all uneaten feed (e.g. hoof stock); Clean drinking water – check and change frequently; Addition of 15% water for aquatic exhibits; Wash / clean food items before feeding (vegetables, browse); Monitor feed intake (ingestion) as a method of health monitoring

### Wild Animal / Feral Animal

Birds (crows, eagles, gulls, pigeons), rodents, mongooses, snakes - Consume animal feed - Secure walls & fences - Traps (rodents) - Feeders that favour zoo animals over wild animals - No domestic animals allowed (walls to prevent feral) - Removal of bird nests from all zoo animal areas - Shoot species of particular concern (crows that pick at zoo animal injuries).



The Afghanistan, Bhutan and Pakistan group despite challenges of language worked very well together.