

Human-Animal Interactions at Zoological Institutions



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MPH Presentation

Interactive Exhibits

- Estimated 6 million people in the US visit petting zoos **EACH WEEK**
- Potential for zoonotic disease transmission
- Educational and enriching experience
- No federal laws protecting human health
 - Some local/state laws have been passed
- Legal implications



Zoonotic Diseases

- 868 of 1415 (61%) human pathogens are zoonotic
- > 50 of these are in the US, including:

Avian influenza

E. coli

Monkey pox

Chlamydomphila psittaci

Rabies

Salmonella

Toxoplasma

Cryptosporidium

Leptospira

MRSA

Q fever

Ringworm

Sarcoptes scabiei

Tularemia



Objective

- Determine what human disease prevention measures are in place with interactive exhibits at zoological institutions
- Determine if annual budget influences these measures



Questionnaire Design

- Approved by AZA Animal Health Committee
- 36 questions, primarily Yes/No
- 3 sections
 - General information (5 questions)
 - Petting zoo exhibit (20 questions)
 - Walk-through aviary exhibit (11 questions)



Participants

- Sent to 166 AZA institutions
- 56 (33.7%) responded
 - 12 had neither exhibit type
- 44 (26.5%) had exhibits of interest



Participating Institutions

Little Rock Zoo (AR)	Fort Wayne Children's Zoo (IN)	Turtle Back Zoo (NJ)
Happy Hollow Zoo (CA)	Indianapolis Zoo (IN)	Seneca Park Zoo (NY)
San Francisco Zoo (CA)	Mesker Park Zoo (IN)	Staten Island Zoo (NY)
Granby Zoo (Canada)	Potawatomi Zoo (IN)	Cincinnati Zoo (OH)
Toronto Zoo (Canada)	Rolling Hills Wildlife Adventure (KS)	Columbus Zoo (OH)
Pueblo Zoo (CO)	Sedgwick County Zoo (KS)	Toledo Zoological Gardens (OH)
Mystic Aquarium (CT)	Sunset Zoo (KS)	Oklahoma City Zoo (OK)
Brandywine Zoo (DE)	Louisville Zoo (KY)	Greenville Zoo (SC)
Disney's Animal Kingdom (FL)	Baton Rouge Zoo (LA)	Chattanooga Zoo (TN)
Lion Country Safari (FL)	John Ball Zoo (MI)	Dallas Zoo (TX)
Zoo Miami (FL)	National Aquarium (MD)	Ellen Trout Zoo (TX)
Zoo Atlanta (GA)	St. Louis Zoo (MO)	Houston Zoo (TX)
Honolulu Zoo (HI)	Lincoln Children's Zoo (NE)	Fossil Rim (TX)
Niabi Zoo (IL)	Riverside Zoo (NE)	Gladys Porter Zoo (TX)
Scovill Zoo (IL)		Milwaukee County Zoo (WI)

Association of Zoos & Aquariums (AZA)

- Established 1924
- Mission – advancement of zoos & aquariums in conservation, education, science, and recreation
- 224 accredited institutions
 - ~2400 animal exhibitors on record with USDA
- 175 million visitors in 2008, 50 million children



AZA Accreditation

- Detailed application followed by multi-day inspection and Accreditation Commission meeting
- Repeat process every 5 years
- Requires maintenance of standards during the 5-yr accreditation period
 - Can result in probation or loss of accreditation



Petting Zoo Responses

Question	<u>Yes (%)</u>	<u>No (%)</u>
Is visitor entry and exit the same?	65.0	35.0
Do visitors and animals share the same space?	77.5	22.5
Do animals have an “escape” area?	92.5	7.5
Is feeding the animals by the public available?	55.0	45.0
Is exhibit fencing routinely disinfected?	12.5	87.5
Are visitors monitored by staff while inside the exhibit?	82.5	17.5
Is food or drink available within 100 feet of exhibit?	27.5	72.5
Is food or drink prohibited inside the exhibit?	85.0	15.0
Are signs visible educating about zoonotic dangers?	42.5	57.5
At the exhibit exit:		
Is hand washing station with soap and running water available?	80.0	20.0
Is signage on hand washing techniques posted?	77.5	22.5
Is sanitizing gel available?	70.0	30.0
Is hand sanitation recommended (by staff or signage)?	85.0	15.0
Are animals routinely examined by a veterinarian?	97.5	2.5
Are animals left on exhibit if showing signs of loose stool?	22.5	77.5

Exhibit Design

- Same entry/exit (26/40; 65.0%)
 - Affects positioning of signage, sinks, etc.
- Share same space (31/40; 77.5%)
 - Increases stress on animals
- “Escape” area present (37/40; 92.5%)
 - Reduces stress
- Fencing disinfected (5/40; 12.5%)
 - Reduces pathogens
 - Reasons why not?



Exhibit Design (cont.)

- Feeding animals available (22/40; 55.0%)
 - Encouraged interaction increases risks
- Food/drink prohibited (34/40; 85.0%)
 - Avoid putting things in mouth
- Food/drink available w/in 100 ft (11/40; 27.5%)
 - Encourages eating/drinking if close to exhibit
- Visitors monitored (33/40; 82.5%)
 - Liability
 - Serves as additional reminder



Hand Sanitation at Exhibit Exit

- Washing station w/soap and water (32/40; 80.0%)
 - Protective benefit to reducing disease risk
 - Design for all visitors (ie, children, handicapped, etc)
- Sanitizing gel (28/40; 70.0%)
 - Effective in human health care
 - Requires removing visible organic material first
- Some form of sanitation (39/40; 97.5%)
- Hand sanitation recommended (34/40; 85.0%)



Signage

- Explaining zoonotic dangers (17/40; 42.5%)
 - Discouraging hand-to-mouth activities
 - Awareness decreases risk
 - Awareness increases hand hygiene compliance
- Detailing proper hand washing techniques (31/40; 77.5%)
 - Signs and verbal reminders increase hand hygiene compliance
 - Easy to read
 - Age and language appropriate



Medical Care

- Routine veterinary exams (39/40; 97.5%)
 - Fecal flotation (38/40; 95.0%)
 - Fecal direct smear (29/40; 72.5%)
 - Performing neither of the above (1/40; 2.5%)
- Rabies vaccine (34/40; 85.0%)
 - Not relevant at 2 institutions
- Left on exhibit w/loose stool (9/40; 22.5%)
 - Aquatic animals
 - Animals with obvious diarrhea will be removed
 - Animals remain on exhibit, but area may be closed



Walk-through Aviary Responses

Question	<u>Yes (%)</u>	<u>No (%)</u>
Is interaction with the birds available/encouraged?	41.2	58.8
Are signs visible educating about zoonotic dangers?	14.7	85.3
Can visitors come in contact with bird feces?	100.0	0.0
Is hand sanitation available near the exhibit exit?	50.0	50.0
Are animals routinely examined by a veterinarian?	85.3	14.7



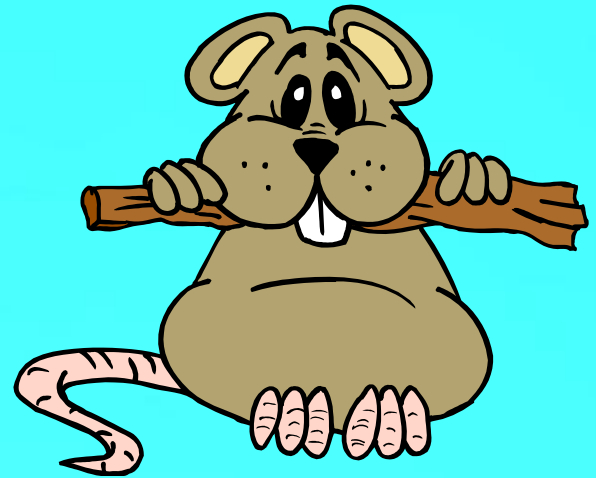
Walk-through Aviary Responses

- Interaction/feeding encouraged (14/34; 41.2%)
- Visitors contact feces (34/34; 100.0%)
 - Exposure to psittacosis, fungal spores
- Zoonotic disease signs (5/34; 14.7%)
- Hand sanitation (17/34; 50.0%)
- Routine veterinary exams (29/34; 85.3%)
 - Fecal flotation (23/34; 67.6%)
 - Fecal direct smear (31/34; 91.2%)
 - Performing neither of the above (3/34; 8.8%)



Disease Linked to Exhibits

- Petting Zoos
 - No illnesses linked to exhibits
 - Animals test positive for *E. coli* O157:H7 (2/40; 5.0%)
 - Goats in petting zoo
 - Pigs not in interactive portion
- Walk-through aviaries
 - Minor bites (1/34; 2.9%)
- Mild cases not reported?



Conclusions

- Benchmarks for comparison
- Most of the respondents currently have human-disease-prevention measures already in place
- No significance ($P > 0.05$) found with budget
- Areas of concern
 - Environmental disinfection
 - Rabies vaccination for ALL mammals
 - Hand sanitation, particularly at aviary exhibits



Where to go from here?

- Small sample size
- Re-approach institutions that did not participate
- Expand to include non-AZA institutions
- Expand questions asked
 - Signage details
 - Quarantine testing and protocols



Acknowledgments

- Committee members
 - Dr. Derek Mosier
 - Dr. David Renter
 - Dr. James Carpenter
- Sunset Zoo staff
 - Mr. Scott Shoemaker, Zoo Director
 - Dr. Robert Klemm, Director Research and Conservation
- Mr. Heath Yates
- Mrs. Landa Colvin-Marion



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Questions

You'll have to
speak up, I don't
hear very well!

