Measuring Animal Welfare

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Towards Positive Animal Welfare

World Association of Zoos and Aquariums (WAZA) United for Conservation®

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Oregon Zoo
A Service of Metro
• Established in 2001
• Formal inclusion and recognition of animal welfare as a central tenet of AZA’s animal programs
AZA AWC Welfare
Definition

Animal Welfare refers to an animal’s collective physical, mental, and emotional states over a period of time and is measured on a continuum from poor to excellent.
Implicit Concepts

- Measures of good/positive welfare
- Emotional & cognitive experiences
- Tradeoffs, opportunities and challenges
- Welfare over an animal’s life time
Resource Based Assessments: AZA Accreditation

Enrichment + Enclosure Design + Nutrition + Research Programs + Veterinary Care + Husbandry Training + Population Management + Staff Training

Maximize the Welfare Potential

the accreditation standards and related policies

2014 edition

Maximize the Welfare Potential
Animal Based Welfare Assessment

• At individual animal level
• Relative, not absolute
• No single measure
Types of Welfare Assessments

- Behavior
  Time budgets, behavioral diversity, activity, species-appropriate behaviors

- Physiology
  Hormone levels, stress response, reproduction, nutrition

- Physical Appearance & Health
  Body condition, muscle tone, species-specific health parameters
## Behavior Lab – Oregon Zoo

### Appendix II: Scan Sample Data and Calculations:

| Species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |

**Legend:**
- G = Guarding
- P = Patrolling
- B = Basking
- V = Vasoctive
- A = Approaching conspecifics
- S = Standing/sitting
- I = Interacting
- R = Resting
- N = Nesting
- M = Mating
- L = Locomotor
- K = Kneeling
- J = Jumping
- I = Ice
- H = Huddling
- G = Grooming
- F = Feeding
- E = Eating
- D = Drinking
- C = Chasing
- B = Boasting
- W = Wrestling
- T = Threat

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- Behavior Check sheets
- Data Collection Apps
- I-Pads
- Camera/Video Recording
- GPS/Accelerometers
- VAST Volunteers!!!
Endocrine Lab – Oregon Zoo
Hormone Monitoring:
Feces, Urine, Serum
Reproductive Monitoring

Investigation of individual and group variability in estrous cycle characteristics in female Asian elephants (Elephas maximus) at the Oregon Zoo

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Abstract

Evaluating ovarian cycle activity through longitudinal progesterone monitoring is important for optimizing breeding management of captive elephants and understanding impact of life events (births, deaths, and transfers) on reproductive function. This study summarized serum progesterone profiles for eight Asian mainframe elephants (Elephas maximus indicus) and one Bornean elephant (E. maximus borneensis) at the Oregon Zoo over a 20-yr period, and represents the longest longitudinal dataset evaluated to date. Estrous cycle characteristics were more varied than previously reported for this species, with an overall duration of 12-19 wk, follicular phase duration of 4-16 wk, and luteal phase duration of 2-12 wk. In general, there was more cycle variability across than within individual elephants. Compared with other elephants in the group, the Bornean female exhibited consistently longer cycle lengths, higher progesterone concentrations, and greater cycle variability; however, it is unknown if this represents a subspecies or an individual difference. Cycle durations did not appear to change over time or with age, and the first postpartum cycle was similar to subsequent cycles. Variability in duration of the follicular phase was greater than that of the luteal phase. In addition, there was a significant negative relationship between initial and follicular phase durations, suggesting a possible regulatory role of the follicular phase in maintaining a relatively consistent cycle duration within individuals. Overall, we found these elephants to be highly resilient in that major life events (births, deaths, and transfers) had minimal effect on cycle dynamics over time. In conclusion, the higher range in cycle phase characteristics is likely because of the larger number of elephants studied and longer duration of longitudinal monitoring, and may be more representative of the captive population as a whole. Furthermore, identification of significant interindividual variability suggests that understanding the complexities of herd reproductive characteristics could facilitate development of more effective institution-specific breeding management strategies.

Keywords: Elephant; Reproduction; Estrous cycle; Follicular phase; Luteal phase; Progesterone

1. Introduction

The Asian elephant (Elephas maximus) is listed as endangered, with estimates of only 25,000 to 50,000 remaining in the wild, and approximately 16,000 managed under human care [1-4]. In North America, there are 269 (53 male, 216 female) individuals in the Asian Elephant Regional Studbook [5]. Currently, this population is not self-sustaining and historically has relied on supplemental imports from range countries to sustain numbers, an increasingly unrealistic option as
The Stress Response
“Good” versus “Bad”

“Eustress”

“Distress”

Days of Study
Physical Indicators

- Good body condition and weight
- Skin, fur, feather condition
- Reproductive success
Combining Measures
Elephant Welfare Project 2010-14

70 AZA Zoos
255 Elephants
27 Researchers

Goal: Provide objective baseline data and identify key factors that impact welfare
Family Matters!

• Multigenerational, matriarchal herds
• Males and females
• Calves
Social Complexity and Choices

• Variable groupings
• Time alone
Exercise - Motivation Is Key

<2 miles/day

>15 miles/day
Space

- Complexity of space
- Substrate
- Interaction and choices
Foraging/Feeding

- Diversity
- Predictable/Unpredictable
Exhibit Transition Study

PhD student Sharon Glaeser & volunteers

Behavior: 5,410 video clips
Physiology: >1,200 fecal and serum samples
Movement & Activity: GPS >90 sessions (24hrs)
Exhibit Transition Study

How are the elephants handling the transition?

Behavior data analyses just started; several trends are emerging:

– Increase in exploratory behaviors
– Increase in resource use (greater diversity in food and enrichment)
– Increase in social contact frequency