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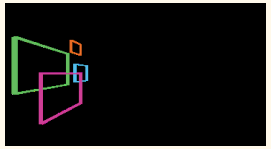
Zoo welfare in practice

Dr Heather J. Bacon BSc (Hons) BVSc CertZooMed MRCVS
Advanced Practitioner Zoological Medicine

Jeanne Marchig International Centre for Animal Welfare Education
University of Edinburgh

Learning objectives:

- **Discuss 'welfare in practice' and welfare assessment as they relate to zoo and aquarium animals.**
  - Discuss the importance of the human animal relationship
  - Categorise husbandry practices (human & animal focused) and how they relate to positive welfare promotion and minimisation of negative welfare.
  - Evaluate the impact of husbandry practices and regulatory requirements (e.g. SSSMZP & Health and safety) on animal welfare
  - Discuss quality of life and lifelong welfare
  - Understand the relationship between animal husbandry and animal welfare (including factors such as choice).
  - Outline the role of internal Ethics and Welfare Committees in zoological collections.



THE HUMAN-ANIMAL RELATIONSHIP

Behaviour-based husbandry

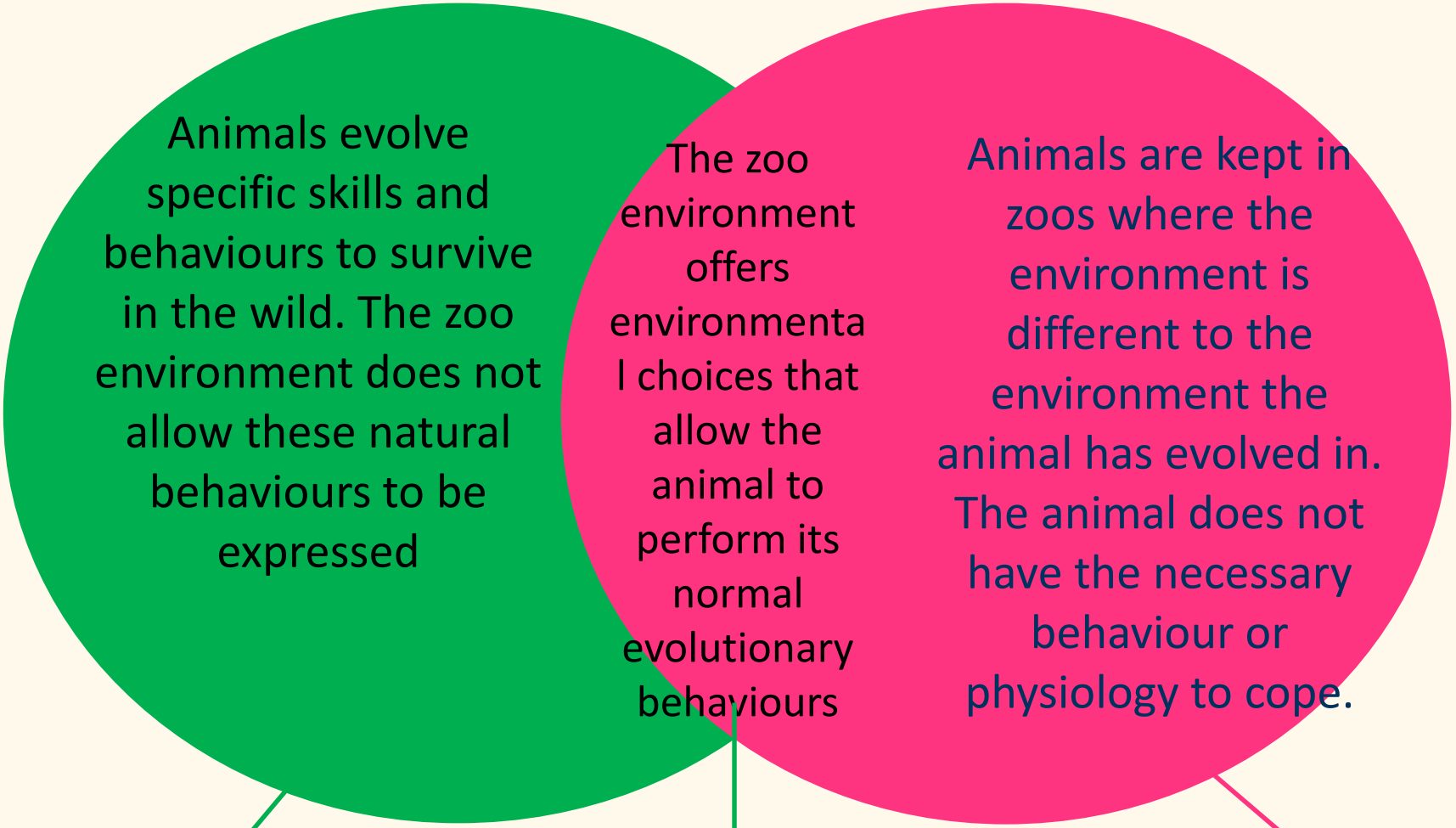
Human agenda:
Activities that are focussed on human rather than animal needs

Animal agenda:
Activities developed to meet the needs of our animals

Zoo visitors and animals

- Research evidence about impact of visitors is mixed - visitors can have negative, neutral or positive impacts on zoo animal behaviour and welfare
- Rank, social status, reproductive status, personality, enclosure design, visitor behaviour, may all influence response to visitors
- What can we control?

Attempts to cope



Are the anima needs provided for?

Foraging/ hunting

Exploring

Digging

Denning

Swimming

Playing

Nesting

Mating/ rearing

Climbing

Browsing/ grazing

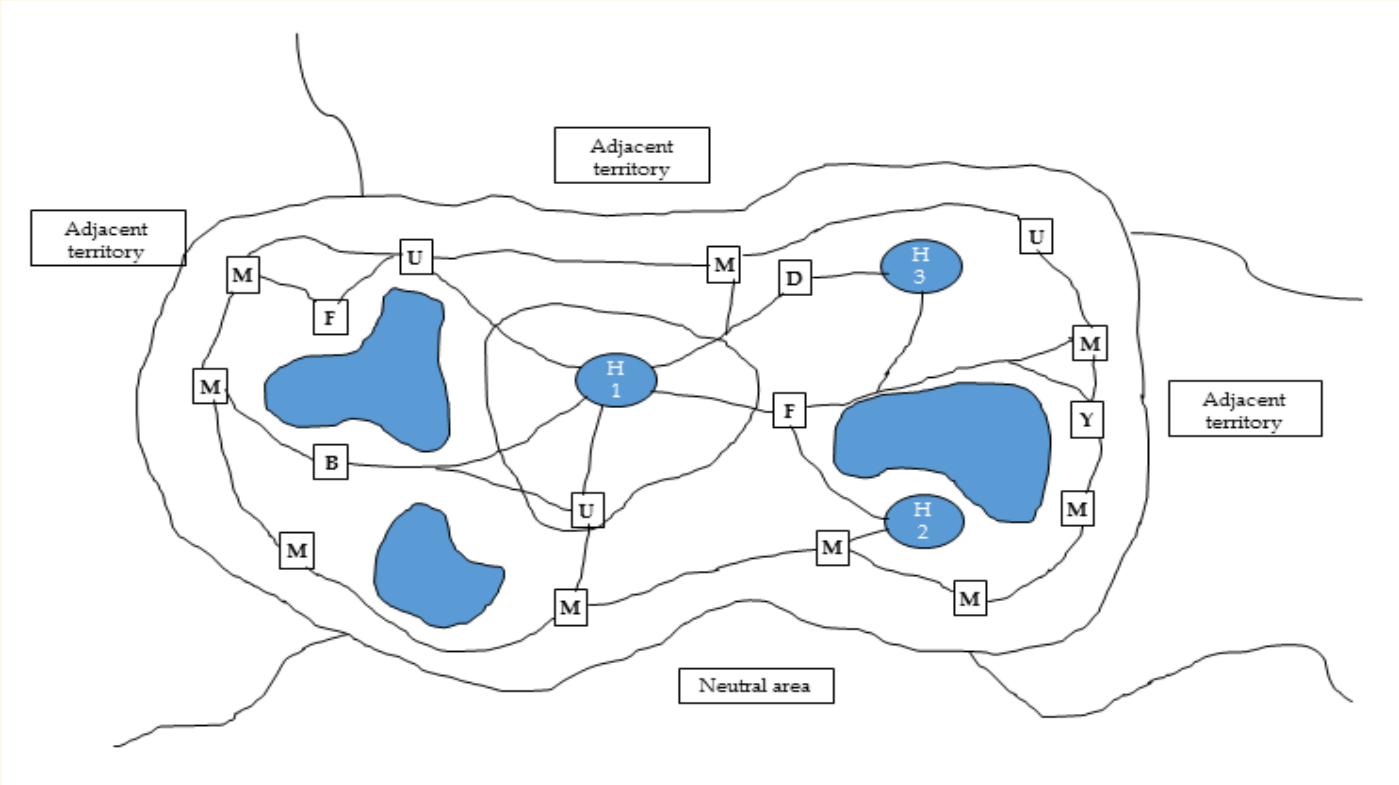
Social interaction

Sleeping/ resting

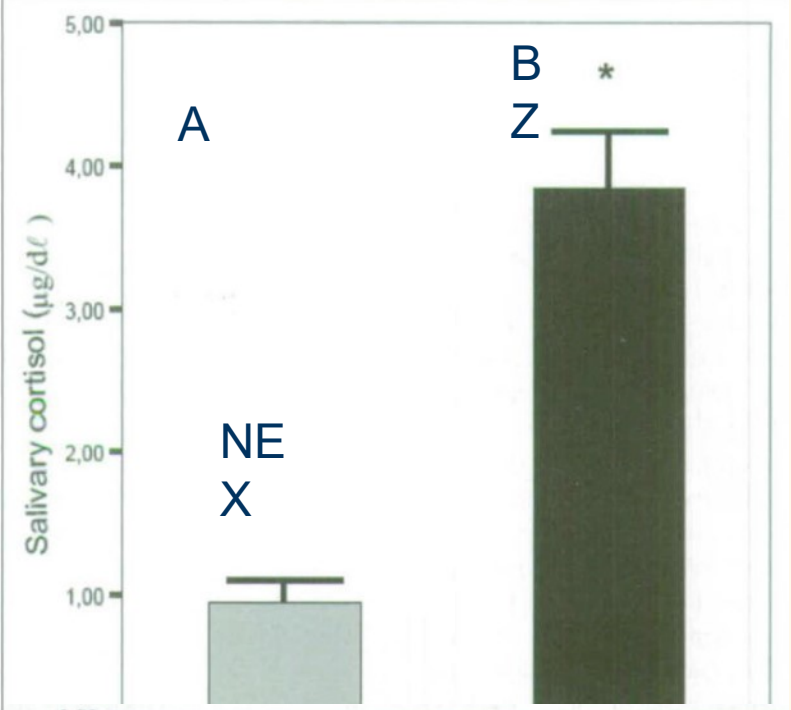
Enrichment

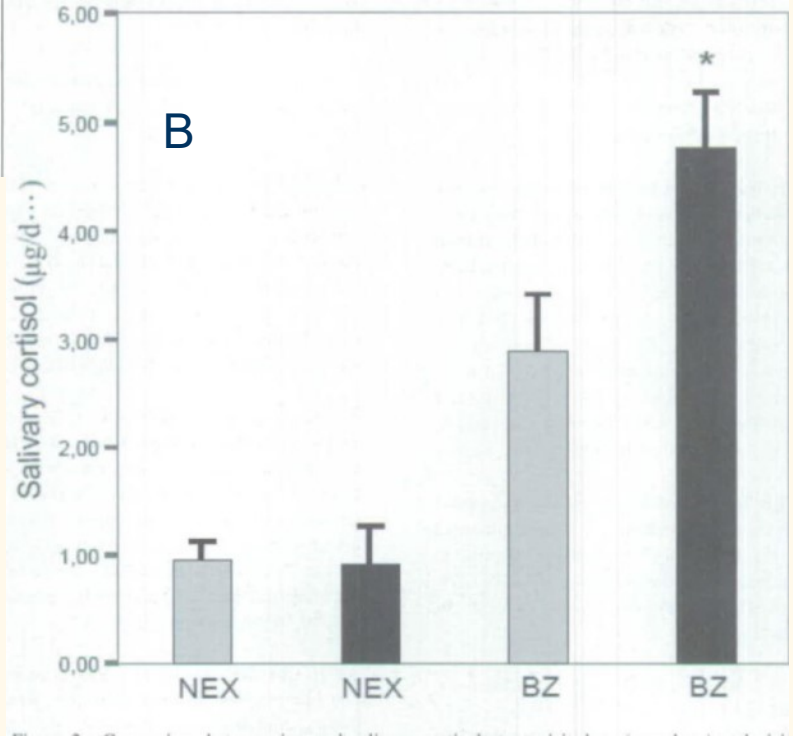
- Is it enriching?
- Does it meet the animal's species-specific evolutionary needs and stimulate their natural behaviours?
- Do they enjoy it?
- Is it unpredictable?
- Is it just novelty/variety/random?
- Not just food

Enclosure design



- Schematic representation of an animal's territory, adapted from Hediger, H. *Wild animals in captivity.*
- Outlining that territories comprise specific resource-locations and travel paths between locations. H1: Primary refuge, H2: secondary refuge, H3: emergency concealment, B: bathing place, F: feeding place, U: urination/defecation place, M: demarcation place, D: drinking place, Y: food storage.





Visitor viewing

- A = Differences in salivary cortisol in jaguars at two different zoos (NEX and BZ)
- B = Salivary cortisol levels in jaguars at the same two zoos on days where visitors are present (black) and are not present (grey)
- Difference is in location of public viewing area in relation to enclosure

Montanha, J.C., Silva, S.L. and Boere, V., 2009. Comparison of salivary cortisol concentrations in jaguars kept in captivity with differences in exposure to the public. *Ciência Rural*, *39*(6), pp.1745-1751.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Keeper animal interactions

- Gorillas who underwent training and play sessions with keepers showed lower rates of abnormal behaviour and higher levels of affiliative and intraspecies play behaviour.
  - Carrasco, L., Colell, M., Calvo, M., Abello, M.T., Velasco, M. and Posada, S., 2009. Benefits of training/playing therapy in a group of captive lowland gorillas (Gorilla gorilla gorilla). *Animal Welfare*, *18*(1), pp.9-19.
- There are differences in the time until response of black rhinoceros and Chapman's zebras when cued by different keepers.
- Keeper knowledge and attitude may significantly influence their stockmanship
- Ward, S.J. and Melfi, V., 2015. Keeper-animal interactions: Differences between the behaviour of zoo animals affect stockmanship. *PloS one*, *10*(10
  - .

Daily routines

- 8am-6pm activity…
  - Feed,
  - Clean
  - Enrich
  - Train

Is this the animal's natural routine?

- Daily?
  - 24 hours?
- Seasonal?
- Life-stage?

Does your daily routine meet the animal's needs?

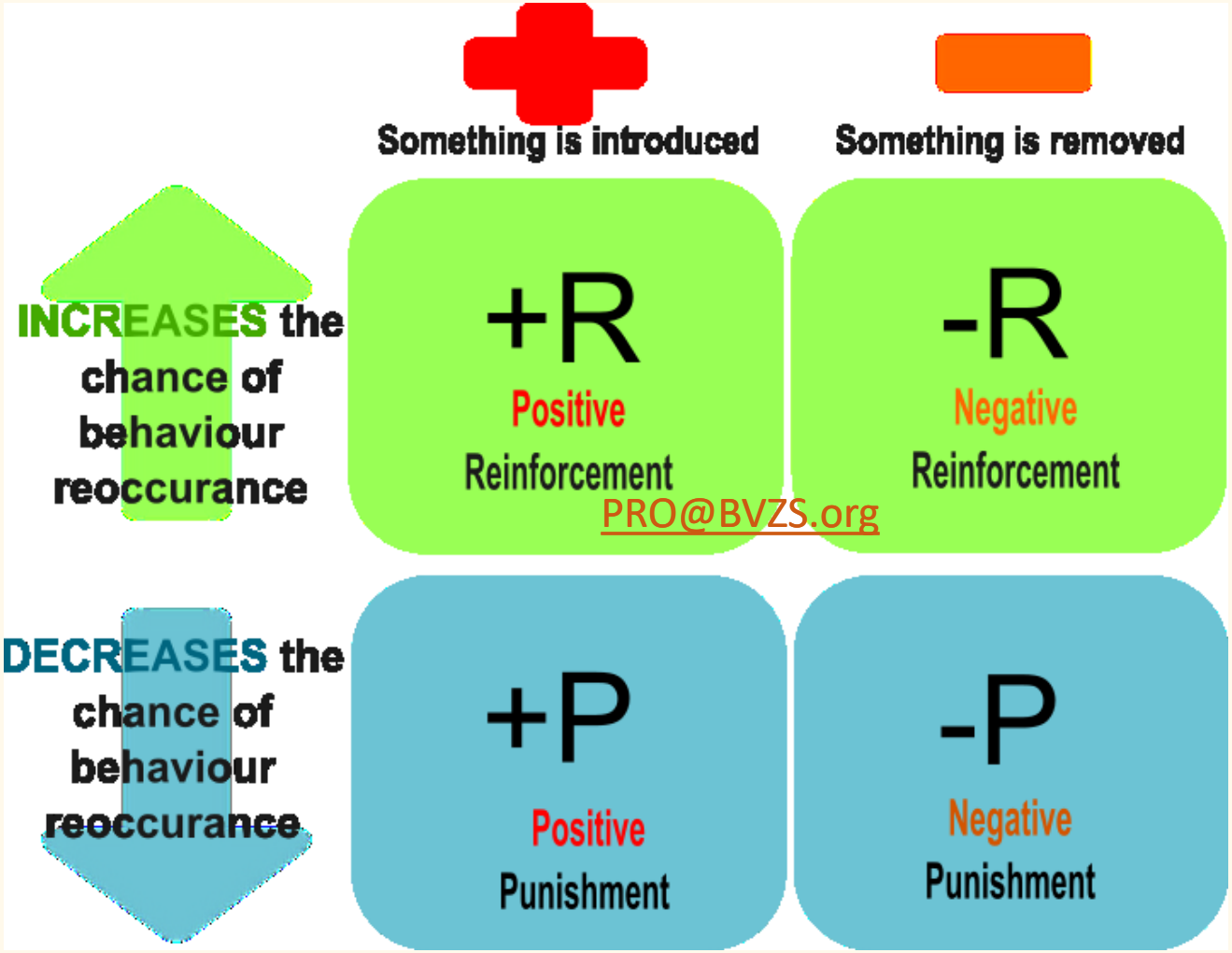
Routines, habit and bias

- There are many opportunities to offer zoo animals meaningful variety, choice and control.
  - Enclosure design and furniture
  - Diet presentation and nutrition
  - Care and maintenance routines
  - Human and animal relationship building
  - Communication (i.e. operant conditioning)
  - Ambient parameters (ex. photoperiod, temperature, sound)
  - Behavioural opportunities
  - Veterinary care.
- How often do we re-evaluate? Why is it so hard?
- Biggest predictor of future behaviour is current behaviour – habit
- Status quo bias – '*it's what we've always done…*'

Training- The animal's agenda?

- Choice?
  - Hunger?
  - Opportunity to leave?
  - Selection of training activity?
  - Repeated repertoire?
  - Frustration?
  - Social isolation?

Operant conditioning



- Involves applying reinforcement or punishment *after* a behaviour
- Focuses on strengthening or weakening voluntary behaviours

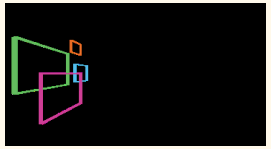
Positive reinforcement training

- **Positive reinforcement** involves the addition of a **reinforcing** stimulus following a behaviour that makes it more likely that the behaviour will occur again in the future
- When a favourable outcome, event, or reward occurs after an action, that particular response or behaviour will be strengthened

Unintentional punishment?

- Slide closing
- Social isolation

- Boring or repetitive training
- Frustration
- Unrewarding ‘rewards’



Choice

Why is choice important?

- *"Providing captive animals with a degree of **control over what they do**, and **choice over how they do it**, is a way of promoting **positive welfare**.*
- *Species-typical behaviour patterns result from environmental selection pressures; therefore, **husbandry practice and enclosure design will support positive welfare when considerate of this evolutionary perspective**."*

Rose, P.E., Nash, S.M. and Riley, L.M., 2017. To pace or not to pace? A review of what abnormal repetitive behavior tells us about zoo animal management. *Journal of veterinary behavior*, *20*, pp.11-21.

Behavioural choice

- Often we use enrichment to add behavioural ‘choice’ to our standard husbandry routines
- But choice should be the foundation of good animal husbandry, not an ‘added extra’.

- Start with the end in sight
  - Healthy animals showing species-appropriate behaviour

Enclosure choice

"Both bears demonstrated behavioural changes when given the choice to access their indoor dens including ***decreased stereotyped behaviours and increased social play****. These results, although based on just two bears, provide additional support for the assertion that choice and control are closely tied to issues of well-being for captive animals."*

Ross, S. R. (2006). "Issues of choice and control in the behaviour of a pair of captive polar bears (Ursus maritimus)." Behavioural Processes **73**(1): 117-120.

Enclosure choice

"Behavioral and hormonal data were compared for four giant pandas in two management conditions: (1) panda confined to exhibit area and (2) panda given choice to move freely between exhibit and off-exhibit bedroom areas.

***Pandas displayed fewer signs of behavioral agitation and lower urinary cortisol in the free choice condition**. Time active did not differ between the two conditions. These results suggest that simply offering pandas free access to alternative locations can improve behavioral and hormonal variables that may be related to well-being."*

Owen, M.A., Swaisgood, R.R., Czekala, N.M. and Lindburg, D.G., 2005. Enclosure choice and well-being in giant pandas: is it all about control?. *Zoo Biology*, *24*(5), pp.475-481

SLAP DOORS

- Bears operate door themselves to access indoor or outdoor enclosures
- Conserves energy in the building (heating, cooling)

CHOOSING TO BE SOCIAL

Choice and Control Doors

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CHOOSING TO BE SOCIAL

Always consider choice

Training Choices

- Bears are not shut in a small space for training – they have the OPTION to leave.
- Bears have the OPTION to train or participate in a public demo
- During some training sessions bears choose which behaviours they want to work on
- “Create” behavior
  - Bear makes up their own behaviors

Making choices using photos

- Tabellario, S., Babitz, M.A., Bauer, E.B., Brown-Palsgrove, M. (*in press*). Picture Recognition of Food by Sloth Bears (*Melursus ursinus*). *Animal Cognition.*

  - Can bears indicate their choices using photos?

  - Pre-testing: Food preference test
    - 25 food items

S. Tabellario

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Making choices using photos

- Phase II: Picture recognition transfer
  - ➢ Novel photos

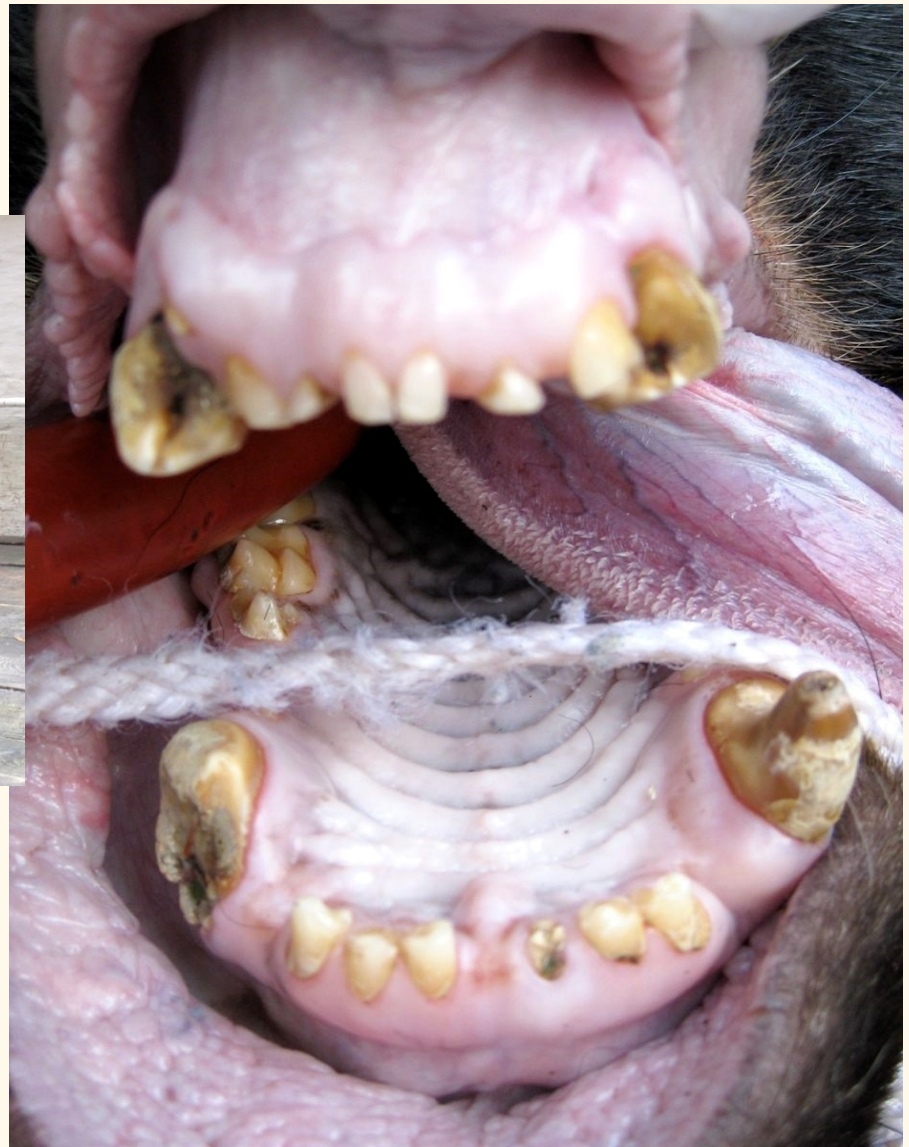
S. Tabellario

- ✓ Bears can recognize 2-D representations of 3-D objects
- ✓ Bears can use 2-D photos to communicate their choices
- ✓ Study used photos of foods
  - Future implications for enrichment choices, habitat choices, social choices, etc.!

What choices are we offering?

- Social?
- Visitor viewing
- Temperature?
- Pain?
- Restricted mobility

Does the animal have a genuine choice?

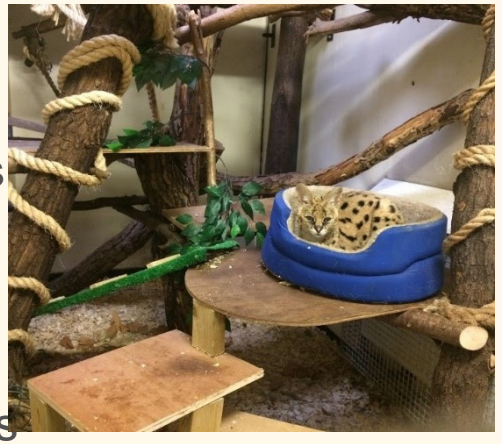


Pain

- Normal behaviour performed excessively or an absence of a normal behavioural repertoire is abnormal.

Management of geriatric animals

- Social grouping – bullying, hierarchy changes, social isolation
- Enclosure design – flooring, bedding, nesting, perching, climbing, foraging etc.
- Operant conditioning – ability to learn and respond, frustration, anxiety.
- Enrichment provision – sensory changes, cognitive abilities anxiety, frustration
- Activity budget – increased sleeping/resting, reduced activity
- Systemic illnesses – heart, kidney, reproductive pathologies etc.
- Pain management – multi-modal analgesia, enrichment, modified enclosures
- Diet – consider dental issues, reduced metabolic rate, higher quality food required



- To combat multiple welfare challenges requires significant investment of resources and time.

Ethical decision-making for geriatric zoo animals

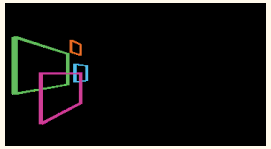
- Is the animal's welfare assessed holistically – not just in terms of physical disease but also in terms of behavioural, social and cognitive decline?
- How are social species managed into old age?
- Is there regular investment in welfare assessment, pain scoring, medical management and husbandry resources for geriatric animals?
- Can the animal's welfare be effectively managed?
- Is this investment a good use of zoological resources?
- What about the welfare of other animals? E.g. enclosure refurbishment, enrichment provision, breeding opportunities, are resources prioritised and budgeted?

Ethical decision-making for geriatric zoo animals

- Conservation resources. Are non-reproductive animals living beyond their ‘natural lifespan in the wild’ contributing to conservation goals? Is the resource-intensive management that they require a justifiable use of resources?
  - Impact on EEP breeding and lack of placement of animals into spaces occupied by geriatric animals?
  - Impact on animal welfare if breeding is limited by lack of appropriate holders due to maintenance of geriatric animals?
  - Maintenance of geriatric animals may support breed-and-cull policies in an effort to maintain reproductive and behavioural health in species where there is no space to house offspring

Summary

- Putting welfare into practice is a necessary part of working in a zoo
- As a keeper you have a big influence on providing good animal welfare, and a responsibility to consider animal welfare and ethics in your daily job
- Beware habitual behaviour and the ‘status quo’ bias



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Thank you
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