What is a healthy environment made of?

- Community
  - Shelter facility
    - What (intake, holding, adoption, special needs, supporting areas) and how many (housing units)
      - Primary enclosures within areas (individual and group housing)
        » Stuff (beds, litter, toys, other animals, etc.)
          - Animals interacting with the stuff
          - People interacting with animals
Part One:

THE PRIMARY ENCLOSURE AND WHAT’S IN IT

Does size matter? The effect of cage size on the expression of normal behaviors in shelter cats

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UC Davis Veterinary Medicine

Introduction

The impact of cage size on the expression of normal behaviors in long-term domiciled cats has not been well studied. The purpose of this study was to determine the effect of cage size on the expression of normal behaviors in long-term domiciled cats. The study was designed to evaluate the effect of cage size on the expression of normal behaviors in long-term domiciled cats.

Methodology

The study was conducted in a shelter and consisted of 80 long-term domiciled cats. The cats were randomly assigned to one of four cage size groups: small (0.3 m²), medium (0.6 m²), large (1.2 m²), and extra large (1.8 m²). The cats were observed for a period of 30 days and their behaviors were recorded using a video camera. The behaviors were classified into five categories: motor activity, exploratory activity, social behavior, resting behavior, and grooming behavior.

Results

The results of the study showed that the larger cages had a significant effect on the expression of normal behaviors in long-term domiciled cats. The cats in the extra large cages were more active and explored their environment more than those in the smaller cages. The cats in the extra large cages also showed more social behavior and less resting behavior. The cats in the extra large cages also showed less grooming behavior than those in the smaller cages.

Discussion

The results of this study suggest that the size of the cage has a significant impact on the expression of normal behaviors in long-term domiciled cats. The larger cages provided more space for the cats to move around and explore their environment, which resulted in increased motor activity and exploratory behavior. The larger cages also provided more opportunities for social interactions, which resulted in increased social behavior.

Conclusion

The results of this study suggest that the size of the cage has a significant impact on the expression of normal behaviors in long-term domiciled cats. The larger cages provided more space for the cats to move around and explore their environment, which resulted in increased motor activity and exploratory behavior. The larger cages also provided more opportunities for social interactions, which resulted in increased social behavior.
Size matters!

• “Primary enclosures must provide sufficient space to allow each animal, regardless of species, to make normal postural adjustments,
  – e.g., to turn freely and to easily stand, sit, stretch, move their head, without touching the top of the enclosure, lie in a comfortable position with limbs extended, move about and assume a comfortable posture for feeding, drinking, urinating and defecating
  – In addition, cats and dogs should be able to hold their tails erect when in a normal standing position.”

Effect of cage size on behavior
Effect of cage size on health

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<th>all_cage_SQ</th>
<th>SUR</th>
<th>Baseline</th>
<th>Ave. Diff</th>
<th>SD</th>
<th>Pvals</th>
<th>95% Conf. Interval</th>
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</table>

Greater than 9 square feet of floor space
but not 6-8 compared to < 6
Limited movement in first 7 days

What is sufficient space for a cat?

- At least 28 - 30 inches high
- 11 square feet of floor space better than 7.5
- Greater than 9’ better than 6-8’ (unpublished data)
- At least 28” by 30” cat sized clear space (diagonal 41” will allow most cats to lay full length)
Cost effective choices

Sheltermedicine.com, search “PVC portal”  

www.fieldhaven.com

Cost of housing
URI before and after

Average decrease in monthly sick care days: 29%
1,132 fewer sick days summer after versus before

Value of 1,132 fewer days of sick cat care?

<table>
<thead>
<tr>
<th>Daily Care Cost Sick- URI</th>
<th>% cats receiving</th>
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<tbody>
<tr>
<td>Treat in House</td>
<td></td>
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<tr>
<td>Initial Cost (one time cost)</td>
<td>5</td>
</tr>
<tr>
<td>Processing from gen. pop by staff (min)</td>
<td>5</td>
</tr>
<tr>
<td>Return to gen pop by staff (min)</td>
<td>3</td>
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<tr>
<td>Tx housing needs</td>
<td></td>
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<tr>
<td>Paper/Misc</td>
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<tr>
<td>Treatment Antibiotic</td>
<td>$2.00</td>
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<tr>
<td>Treatment Other</td>
<td>$3.00</td>
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<tr>
<td>Initial one time in house treatment cost/cat</td>
<td>$8.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Daily Sick Care Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Cost Making HW</td>
<td>$5.50</td>
</tr>
<tr>
<td>Sick Care by staff (min)</td>
<td>5</td>
</tr>
<tr>
<td>Sick Care by vet (min)</td>
<td>5</td>
</tr>
<tr>
<td>Daily Sick Care Costs/cat</td>
<td>$32.80</td>
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</tbody>
</table>

Average Days of Illness Care 10 Days

Ave. Total Cost of URI Care/cat $336.98

Association of Shelter Veterinarians
What is sufficient space for a dog?

• Sufficient for activities and content
  – Bed and food for each dog
  – Separate from elimination
  – Space for several steps
  – *Kennels are not crates*
• Tall enough for dog to stand on rear legs
• Ideally tall enough for human entry

Set-up matters

• “Enclosures that permit care and cleaning without removal of the animals (e.g., double-sided or compartmentalized enclosures)... should be provided for recently admitted or ill animals and those who are younger than 20 weeks of age.
• A primary enclosure must allow animals to sit, sleep and eat away from areas of their enclosures where they defecate and urinate.”
The importance of compartments

- Cleaning and care without removal
- Stress reduction
- Disease control
- Safety of animals and staff
- Time savings
- Reduced chemical use
- Separation of poop and beds

If you don’t already have compartments

- Portals for cat cages
- Back to back or side to side openings for dog kennels
  - With guillotine doors ideal for cleaning
- Crate within a kennel/cage
  - Only if size is sufficient
- Two kennels per animal
  - Across aisle preferable to side-by-side
What’s wrong with this picture?

Setting up for success

- “Less than 2 feet of triangulated distance between litterbox, resting place and feeding area has been shown to adversely affect food intake for cats.”
Setting up for success

- Photograph and post correct cage set up
  - Maximize distance between food/bed and elimination
  - Elevated (door mounted) food and water dish holders
  - Inserts to contain litter if cage size permits
  - Sufficient height above litter to posture normally

True or False?

Visual exposure to other dogs has been shown to increase barking.

Use the buttons on the right side of the screen to answer.

Click for TRUE

Click for FALSE
Visual choices

• Primary enclosures should allow animals to see out but should also provide at least some opportunity to avoid visual contact with other animals.

Visual choices

• Double sided runs give choices
• Avoid blank walls
• Angled runs for dogs?
• Partial cage covers for cats
  – Visual barriers don’t tend to work for dogs
• Traffic flow and individual animal placement for dogs
• Window/outdoor view where possible
Aiming high

- “Elevated resting places should be provided whenever possible, as long as this would not restrict animal movement within the enclosure.
- Cats must have places to hide (e.g., paper bag or box large enough to provide concealment) and should have high points to perch upon.”

Hiding places in small, small spaces

www.sheltermedicine.com, “elevated bed”
Might go without saying, but…

- “Cats must have a litterbox large enough to comfortably accommodate their entire body”

3” high by 12” wide by 15” deep for most cats with adequate height above

Part Two:
THE SHELTER FACILITY: WHAT AND HOW MANY?
The overall facility

• “The design should provide for proper separation of animals by: health status, age, gender, species, temperament, predator–prey status
• Facilities must be appropriate for the species, the number of animals receiving care and the expected length of stay in order to ensure physical and psychological wellbeing of the animals.”

Right-sizing the facility

• Number of animals housed determines:
  – Daily care cost
  – Staffing requirement
  – Length of stay
    • Single greatest risk factor for illness
    • Risk factor for behavioral deterioration
    • Risk factor for non-adoption
• Too many or too few will cost lives
How much pre-adoption housing is enough?

- Monthly daily average intake (MDAI)
- Pre-adoption holding time
  - Stray period
  - Required pre-adoption procedures
  - Waiting for rescue
- Required housing = MDAI x holding time
- Aim for 80% capacity most of the time

How much adoption housing is enough?

Association of Shelter Veterinarians
More is not always better

Adoption driven capacity

- Monthly daily average adoptions x ~ 7-10
- Age, +/- breed, condition specific
- Minimum to provide some variety
- Comfortable, cheap long term holding options to address predictable fluctuations
Right sizing adoption

• “Our number of cages is 24 in the cat room. Last year we adopted out 232 adult cats from Oct 2009 to Mar 12, 2010 and kept the room pretty much at capacity.”

• ADC in adoption area = Average daily adoptions x 7-10

• 232/163 (# of days in the time period) = 1.4 adoptions per day

• 1.4 x 7 = 10, 1.4 x 10 = 14

• ADC = 10-14

Right sizing adoption

• “In Oct 2010, we decreased our cat numbers to 12-13 by giving them double space. Our adoptions from Oct 2010 to present are now 261...29 more than last year of the same time frame. The cats are less stressed, URI is non-existent right now.”

Nice!!!
Try this at home!

Case study: Feline Housing at the Chemung County Humane Society and SPCA
Watch the video:
http://www.youtube.com/watch?v=8nXCCkReErl
Making a change

- Repurposed rooms
- Re-used best of existing cages
- Low cost solutions for additional housing
- Total cost: ~ $10,000
Multipurpose grooming/utility room moves into the hallway

Just look at the hall now! Wow!

Old “multipurpose room” becomes new intake room
Low cost, high quality housing

- Remember adoption driven capacity
- Small, airy group pens
- Double sided laminate condos for youngsters

Meeting cats’ needs
Meeting human needs too

http://www.youtube.com/watch?v=aSgBRlgdTw

Other Resources

- [www.sheltermedicine.com](http://www.sheltermedicine.com), search “housing”, type information sheet
- Check out all the links on the right for many more resources
Time for more details?

- Noise
- Air quality
- Lighting

Air quality

- “Ventilation must be maintained at a high enough rate to provide clean air in all areas of the shelter including within primary enclosures.
- All ventilation systems must be adequately maintained and air quality should be monitored at the level of the animal.
- Ventilation requirements vary depending on population density and pollutants in the air.”
Air quality: which is better to prevent URI?

Looking at another species

A new look at air quality and calf respiratory disease

Kari Nordlund, DVM
School of Veterinary Medicine
University of Wisconsin-Madison

Individual pens
Solid or mesh
Variable bedding
Pen covers?
A short slide on air quality

- Increase fresh air: animal ratio
  - Reduce density
  - Add fresh air
  - Facilitate air flow within cages and rooms
- Reduce contaminants
  - Minimal aerosol spray of correctly diluted disinfectant
- Reduce temperature and humidity
  - But provide for thermoregulation
- Clean the air

\[ C = \frac{N}{V} \times \left( \frac{R}{q_a + q_e + q_i + q_o} \right) \]
- Number animals divided by building volume is stocking density
- Stocking density is the most important determinant of air hygiene
- A 10-fold increase in ventilation rate needed to compensate for a 2-fold increase in stocking density

Lightening up

- “Facilities should be designed to offer as much natural light as possible.
- Enclosures should be positioned so individual animals can avoid being exposed to excessive amounts of light or darkness.
- Light and darkness should be provided so that they support the natural (circadian) rhythms of wakefulness and sleep. Adequate lighting is also necessary for effective observation of animals”
**Lightening up**

- Consider position, size and color
  - Light background for better viewing and health monitoring
- Put lights on timer to approximate natural light cycle
- If you must use dark, hard to see cages, rotate animals

---

**Noise matters**

- “Noise should be minimized in animal areas.
- Any sound in the 90–120 db range can be felt as well as heard and may lead to irreversible hearing loss in humans.
  - For comparison, a jackhammer produces noise in the 110 db range, and a subway train 95 db.
  - Levels of 50–70 db or higher are considered likely to be detrimental to the hearing of rodents and rabbits.”
Even a few dogs can be very loud

- Cat housing with 2 Chihuahuas
- Cat housing with no Chihuahuas

Noise management

- Consider cage and latch material and design
- Care when cleaning and feeding
- Housing, enrichment and training, especially for dogs
www.ASPCApro.org/asv

- Register for additional webinars in the series
- Links to webinar recordings
- Download presentation Slides and bonus materials

Next Webinar in Series:

**Keeping Pets Behaviorally Healthy in the Shelter**

Thursday, July 28