



Housing for Health, Wellness and Success: Standards for Facility Design and Environment

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UC Davis Koret Shelter Medicine Program

www.sheltermedicine.com

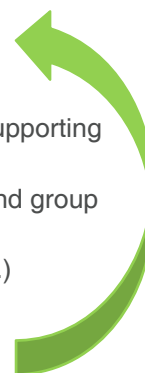
www.facebook.com/sheltermedicine



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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



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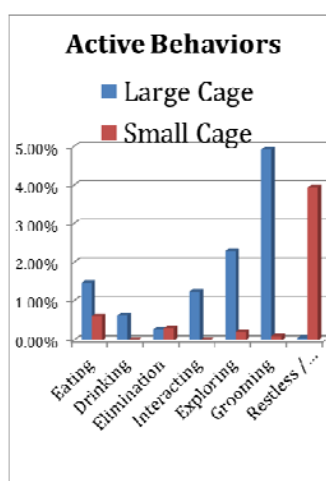
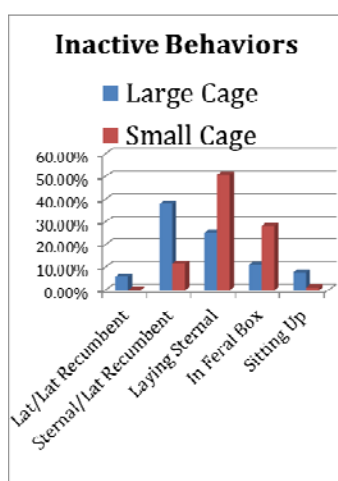
Size matters!

- “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.”



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Effect of cage size on behavior



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Effect of cage size on health

all_URI_GT2	IRR	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
new_cifs_2	.8466349	.1243785	-1.13	0.257	.6348145	1.129134
new_cifs_3	.4896522	.0598454	-5.84	0.000	.3853484	.6221882
mixed	.3275651	.1583542	-2.31	0.021	.1269998	.844875
ln_total_cage	1.179146	.3084261	0.63	0.529	.7061895	1.968857
Movement_1-7	.1891859	.0390889	-8.06	0.000	.1261876	.2836357
Intranasal-1	1.463807	.3018267	1.85	0.065	.9771741	2.192782
new_hs_2	1.050598	.4976885	0.10	0.917	.415151	2.658687
new_hs_3	.7965236	.2267483	-0.80	0.424	.4559162	1.391593
new_season_2	.722167	.0468721	-5.02	0.000	.6359025	.8201339
new_season_3	.7874888	.0896001	-2.10	0.036	.6300792	.9842234
new_season_4	.9176195	.1682131	-0.47	0.639	.640656	1.314318
Total_heal-1	(exposure)					

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



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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)



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Cost effective choices



Sheltermedicine.com, search "PVC portal"



www.fieldhaven.com



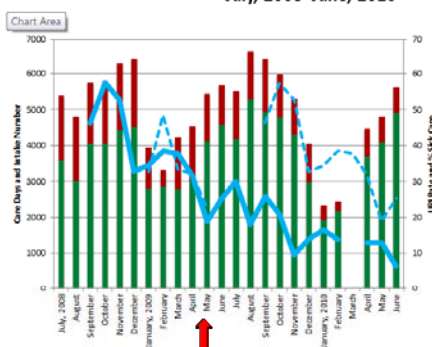
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Cost of housing



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URI before and after



Average decrease in monthly sick care days: 29%

1,132 fewer sick days summer after versus before



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

Daily Care Cost Sick- URI		% cats receiving	
Treat in House			
Initial Cost (one time costs)			
Processing from gen. pop by staff(min)	5		
Return to gen pop by staff(min)	5	80 %	
Veterinary (min)	5		
1x housing needs			
Paper/Misc			
Treatment Antibiotic	\$2.00	100 %	
Treatment Other	\$1.00	35 %	
Initial one time in house treatment cost/cat			\$8.35
Daily Sick Care Costs			
Daily Cost Healthy Cat	\$30.63		
Sick Care by staff(min)	5	80 %	
Sick Care by vet(min)	5	33 %	
Daily Sick Care Costs/cat			\$32.86
Average Days of Illness Care		10	Days
Ave. Total Cost of URI Care/cat			\$336.98



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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



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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.”

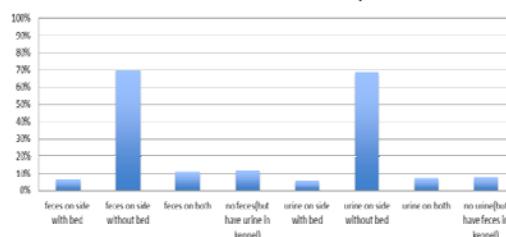


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The importance of compartments

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

Kennel Elimination Preferences:
171 shelter dogs in double sided (bed on one side) indoor kennels in shelters with daily walking programs
(961 observations of elimination in kennel (398 days recorded with no elimination in kennel))



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If you don't already have compartments



Figure 6-Multi-purpose Side Access Kennels

Swattmiersarchitects.com

- 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



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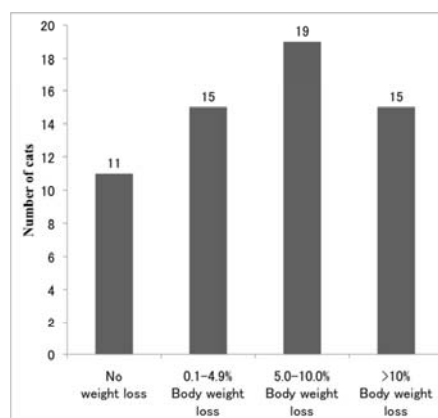
What's wrong with this picture?



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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.”



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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



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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**



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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.



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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



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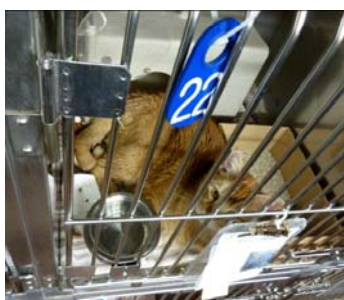
Aiming high

- “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.”



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Hiding places in small, small spaces



www.sheltermedicine.com , “elevated bed”



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Might go without saying, but...

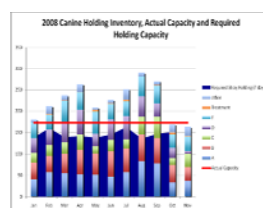
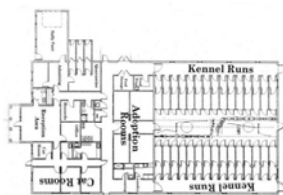
- “Cats must have a litterbox large enough to comfortably accommodate their entire body”



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



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Part Two:

THE SHELTER FACILITY: WHAT AND HOW MANY?



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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.”



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Right-sizing the facility

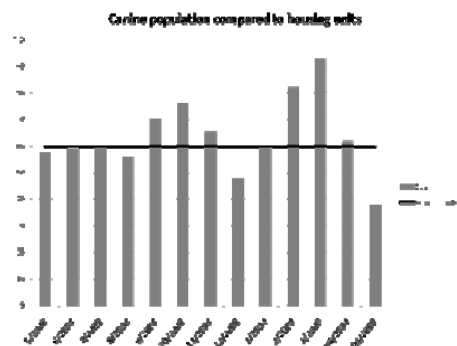
- Number of animals housed determines:
 - Daily care cost
 - Staffing requirement
 - Length of stay
 - Single greatest risk factor for illness
 - Risk factor for behavioral deterioration
 - Risk factor for non-adoption
- Too many or too few *will cost lives*



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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 = $\text{MDAI} \times \text{holding time}$
- Aim for 80% capacity most of the time



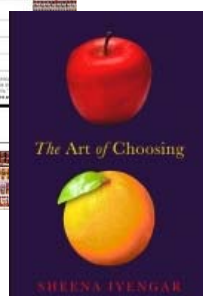
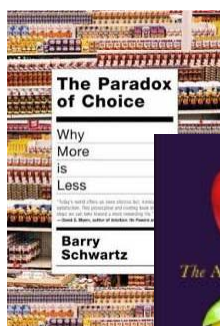
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How much adoption housing is enough?



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More is not always better



Dating Study Says Singles With Options Go For Hotties

by KATHY HUGHES

Listen to the Story
Morning Edition (3 min 24 sec) [Add to Playlist] [Download] [Transcript]

April 19, 2010 written by A.A.

Scientists already know people's brains can be overwhelmed by choice, say when shopping for electronics, detergent — even chocolate. Too many options can lead to much confusion, often followed by indecision or snap judgments.

Psychologist Alison Lenton wanted to find out if the same psychological state of being overwhelmed happens when we're choosing people — like someone to date. Lenton, who studies experimental social psychology at the University of Edinburgh, and economist Marco Francesconi of the University of Essex, decided to study this by looking at speed dating.



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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



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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.”
- $\text{ADC in adoption area} = \text{Average daily adoptions} \times 7-10$
- $232/163 \text{ (\# of days in the time period)} = 1.4 \text{ adoptions per day}$
- $1.4 \times 7 = 10, 1.4 \times 10 = 14$
- $\text{ADC} = 10-14$



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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!!!



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Try this at home!

The screenshot shows the ASV website with the article "Calculating shelter capacity" selected. The article text discusses the importance of understanding and maintaining shelter capacity to provide humane standards of care. It mentions that given the great number of homeless pets in need of care, it can be difficult to imagine defining, let alone providing, "sufficient" capacity for this seemingly infinite population. However, the problem of homeless animals is not really one of housing capacity, but one of flow through capacity. Of course we know this already: if a shelter simply admitted all animals that came through the door and never released them, virtually all facilities would soon be inoperably overcrowded. The issue that ultimately the problem must be largely solved by reducing the number of animals in need of shelter through prevention programs, and by ensuring that the remaining homeless animals pass through shelters successfully to a positive outcome. Fortunately, sufficient capacity is a much more attainable goal once we realize that we do not need to "house our way out of overpopulation" but simply provide humane conditions for a finite number of animals as they pass through our care.

Download: [Calc_shelter_capacity_2011.doc](#)

The website footer includes links for About Us, Donate, In Tribute To, Center for Companion Animal Health, Affiliated Shelters, Funded Programs, News, Personnel, Services, Shelter Health Evaluations, Facility Design, Foster service, Diagnostic Services, Shelter Health Portal, Ask Shelter Medicine, Frequently Asked Questions, Information Sheets, Reference Library, Education, Internship Opportunities, Residency Program, Event Calendar, Lecture Library, Shelter Medicine Class 2011, Research, Current Research/Projects, and Follow Us (Facebook, Twitter, YouTube). It also includes the ASV logo and the text "Association of Shelter Veterinarians".

Case study: Feline Housing at the Chemung County Humane Society and SPCA



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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



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Old "multipurpose room" becomes new intake room



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Low cost, high quality housing

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



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Meeting cats' needs



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Meeting human needs too

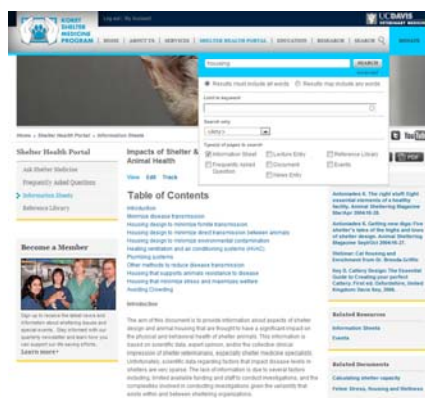


<http://www.youtube.com/watch?v=aSgBRlqdgTw>



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Other Resources



- www.sheltermedicine.com, search “housing”, type information sheet
- Check out all the links on the right for many more resources



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Time for more details?

- Noise
- Air quality
- Lighting



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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.”



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Air quality: which is better to prevent URI?



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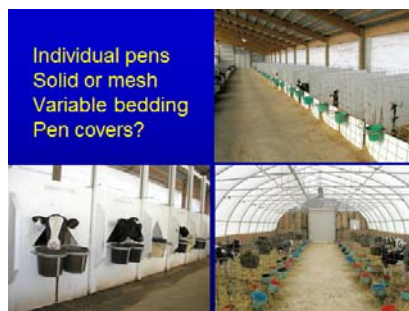
Looking at another species

A new look at air quality and calf respiratory disease

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



Individual pens
Solid or mesh
Variable bedding
Pen covers?



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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

$$C = \left(\frac{N}{V} \right) \times \left(\frac{R}{q_r + q_s + q_d + q_v} \right)$$

$$\left(\frac{N}{V} \right)$$

- 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



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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”



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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



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Noise matters

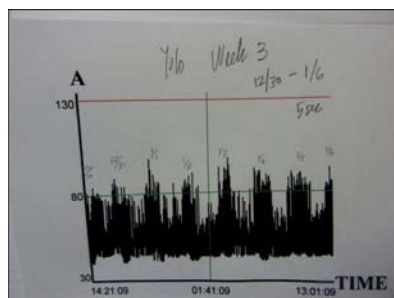
- “Noise should be minimized in animal areas.
- Any sound in the 90–120 db range can be felt as well as heard and may lead to irreversible hearing loss in humans.
 - For comparison, a jackhammer produces noise in the 110 db range, and a subway train 95 db.
 - Levels of 50–70 db or higher are considered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



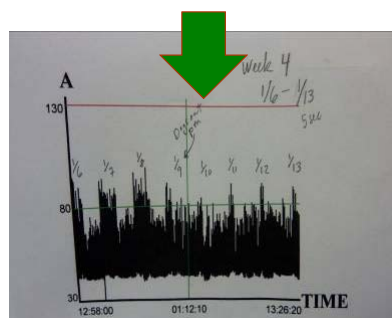
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Even a few dogs can be very loud

Cat housing with 2 Chihuahuas



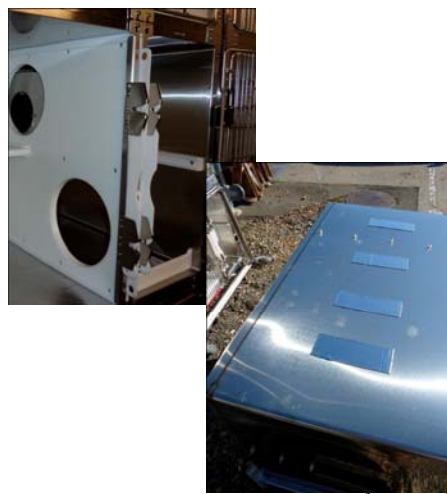
Cat housing with no Chihuahuas



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Noise management

- Consider cage and latch material and design
- Care when cleaning and feeding
- Housing, enrichment and training, especially for dogs



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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



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