Article

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Getting On the Same Page: Using a Checklist to Communicate Environmental Enrichment

Multiple species, study protocols and user needs make it difficult to develop a one-size-fits-all approach to standardizing enrichment. Fortunately, it turns out that there is a very simple solution to the complex issue of getting everyone on the same page—literally! A one-page enrichment checklist can be used to indicate enrichment strategies for each study protocol. This checklist indicates to Principal Investigators (PIs) which enrichment options are available, encourages them to make decisions based on animal behavior, and communicates to the animal care technicians on which enrichment strategies may be provided to the animals in a particular study.

While working in a large diverse pre-clinical research company, agreeing on standard practices and communicating changes was challenging (sound familiar?). In my previous position as Behavioral Management Specialist, I was tasked with coordinating enrichment practices for rats, mice, guinea pigs, hamsters, dogs, swine, and nonhuman primates. Our studies ranged from metabolism and pharmacokinetics, to GLP toxicology, surgery, and cardiovascular and metabolism disease models. Some groups allowed for only very specific, limited enrichment options, while others were happy to give as much enrichment as possible. Allowable enrichment varied by species, type of study, and Study Director discretion. These rules were unwritten and passed on to new techs verbally, which made them difficult to adhere to, and difficult to monitor. The challenge was to capture this information for each study, in a manner that created the least impact on work practices, but was readily available to technicians providing enrichment.

> Keeping everyone in a vivarium informed and in agreement on enrichment practices for laboratory animals can be a bit like herding cats.
>
> In other words, next to impossible!

The *Guide for the Care and Use of Laboratory Animals* describes reasons for providing enrichment, possible unintended consequences of enrichment, and a short list of examples of enrichment strategies. It does not, however, prescribe specific enrichment strategies. Ultimately, decisions on environmental enrichment must be agreed upon and reviewed by the IACUC, researchers and veterinarians[1]. Since all study protocols need to be approved by the IACUC, this was a good place to get everyone on the same page. After meeting with the IACUC and receiving their support, we decided to create a standard list of suggested enrichment options, so that PIs were not required to write up their own. Prior to setting standards for environmental enrichment, literature searches were performed to develop lists of species-specific behaviors, and then enrichment was assessed on the ability to promote these behaviors. From that, checklists were created for each species, listing enrichment that was approved by the veterinary staff.

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Enrichment was divided into categories, and the PI was required to select at least one item from each category.

Approved Rodent Environmental Enrichment
Study:_____ Room: _____

Check the boxes for any enrichment that can be provided. At least one option should be selected from each category.

Gnawing Object	Nylabone®	☒
	Gnawpuck	☒
	Kong®	☒
	Gumabone® (mice only)	☒
	BioServ® manufactured rodent treat	☒
	raisins	☒
Nesting/Housing	Nestlet™	☒
	polycarbonate hut or tunnel	☒
	PVC tunnel	☒
	Gnawpuck®	☒
	polypropylene Cozee Pad®	☒
	polycarbonate Rest Stop	☒
	paper or cardboard huts	☒
Social Interaction	group housing	☒
	Pair housing	☒

Study Director signature/date: _____

If no options in a category were acceptable, the PI needed to justify the omission in the animal use protocol. For example, the rodent checklist offered options for gnawing behaviors (listing different devices and materials which promoted chewing), nesting behaviors (various substrates to build nests and solid structures such as tunnels and huts) and social behaviors (pair or group housing).

The PI could select as many options as were allowed in each category, and could add a specialized item in the "Other" box. These forms were signed by the PI and submitted to the IACUC along with their animal use protocol. The IACUC served as the gatekeeper, ensuring that a checklist was provided with each submission, and that each category had a selection or justification for not selecting. These forms were then posted to a shared online site that was accessible to animal care, veterinary staff and investigators. A copy of the IACUC approved completed form was then posted on each animal room door.

Once the checklists were created, the process became self-sufficient fairly quickly. PIs were not opposed to the extra work, as the form only required checking a few boxes, adding a name, date and protocol number. The trade-off was the confidence that animals were receiving only enrichment appropriate for their particular research. The animal care staff located the checklist online, printed it, and posted it to the animal room door. This was often faster than leaving a message for a PI asking which enrichment was allowed, and waiting for a response before setting up caging. It was certainly more efficient than guessing which enrichment was allowed, setting up, then having to go back through 800 mouse boxes and remove nesting material that was not allowed for

Approved Nonhuman Primate Environmental Enrichment
Study: _____ Room: _____

Check the boxes for all enrichment that can be provided. At least one option should be selected from each category.

Food treats	standard produce*	☒	**Foraging device**	Challenger ball™	☒
	seasonal produce**	☒		Shake-a-treat™	☒
	raisins	☒		Crumble Disk holder™	☒
	coconut	☒		Puzzle feeder	☒
	peanuts, peanut butter	☒		PVC tube or cups	☒
	marshmallow	☒		fleece board	☒
	jell-o	☒		stuffed animal	☒
	cereal	☒		paper bag	☒
	Prang (frozen treats)	☒		foraging tray with turf	☒
	honey	☒	**Social Interaction**	tactile (grooming bars)	☒
	sunflower seeds, granola, trail mix	☒		social housing- all day	☒
	Ketchup, jelly	☒		social housing -partial (overnight)	☒
	BioServ® manufactured treat***	☒			
	Sugar-free (jell-o, Prang, BioServ treats)	☒		positive human contact	☒
	popcorn	☒			
Floor/hanging Device	Kong varieties, Dental Ball®, Hercules ®	☒	**Audiovisual**	television	☒
	plastic ball/half-ball, dumbbell	☒		radio	☒
	Nylabone®	☒		sound machine	☒
	stainless steel rattle or mirror	☒			
	PVC pipe	☒			
	Tug toy®	☒			

* apple, orange, grape, banana, sweet potato, carrot, celery
**extra produce types not fed out on a usual basis, such as watermelon or pumpkin
*** Primatreat™, crumble disk™, nutrablock™, foraging crumble™, etc...

Study signature/date:_____

a particular study! The IACUC administrator only needed to remind PIs a few times to include the form along with a submission, and it only took a few seconds to review the form for completeness. After helping with the initial creation of the checklist, the Attending Veterinarian could sit back and relax, knowing that animals were receiving species-appropriate enrichment that contributed to good animal welfare.

It's not very often that a complex problem can be solved by a simple solution, and rarer still that a solution exists that makes everyone happy. This new process was circulated to different groups for feedback, then clearly communicated to everyone involved, emphasizing the benefits and limited resources required to implement. In this case, communication was part of the problem and part of the solution. Initially we identified the problem as "animals are not getting the right enrichment". The problem was actually communicating about enrichment to the PIs on what enrichment was available and recommended for each species, and to the care staff and IACUC on what enrichment was allowed for each study. In order to get everyone on the same page, it took creating a page that everyone could understand. It turns out that herding cats is a lot easier when everyone agrees which direction to go in, and achieving agreement isn't always as difficult as it seems.

References:

1. Institute for Laboratory Animal Research. 2011. *Guide for the care and use of laboratory animals*, 8th ed. Washington (DC): National Academies Press.