# Stress relief: Lab mice that exercise control may be more normal

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Lab mice, given the proper materials, can build nests as elaborate as their wild counterparts. This is a behavior that Purdue researcher Joseph Garner, from left, and graduate student Brianna Gaskill said relieves stress for the animals. (Purdue Agricultural Communications Service photo/Tom Campbell)

(PhysOrg.com) -- Purdue University scientists found that mice raised in cages may relieve stress with behaviors associated with mice in the wild. And for researchers using lab mice, this may mean that by allowing mice to express these behaviors they can conduct research with animals that act and respond more naturally, hopefully making research data more reliable.

Laboratory mice live in sterile environments controlled by humans. Joseph Garner, assistant professor of animal sciences, said that can be stressful for the animals because they do not have much control.

"The perception of its ability to control stress has a bigger impact on the animal than does the stress itself," he said. "Chronic, uncontrollable stress changes animals, making them different than normal. This ultimately makes them less valid research subjects."

For example, if a person is cold, putting on a jacket or turning up the room temperature can relieve the stress. However, lacking the ability to make oneself warmer causes further stress, making the person more likely to become ill, undergo physical changes and behave in ways that are not normal. The same is true for a mouse.

In a couple of different experiments, Purdue researchers tested the ability of mice to control and select their preferred environment.

In research reported online this month in the journal Applied Animal Behavior Science, Garner and his team "asked" mice which room temperatures they liked best. The typical lab mouse is kept in a room at about 70 degrees Fahrenheit, which according to test results, is colder than they like.

The scientists placed mouse cages in custom-built water baths set to different temperatures, connected the cages with tunnels and waited for the mice to "vote with their feet." The mice chose which cages to spend time in, with the most popular choice being the warmest cage kept at 86 degrees Fahrenheit.

"They actually select different temperatures at different times of day and for different behaviors," Garner said. "So, while they preferred the warmer temperatures most of the time, it may not be possible to select a single preferred temperature for all mice."

To further test the ability of lab animals to control their environment, Garner and his research team conducted an experiment to find out if

mice could and would build better nests. Nest-building is a normal behavior for mice in the wild that is usually not seen in lab mice. Garner theorized that laboratory mice, like mice in the wild, would build nests for warmth.

The researchers provided the animals materials like those found in nature, and the caged mice instinctively built elaborate and complex nests very similar to those constructed by their wild counterparts. The research was reported in the November issue of the Journal of the American Association for Laboratory Animal Science.

The Purdue researchers propose that nest building is both a form of stress relief and a way to enrich the quality of life for mice.

"Nest building is part of the 'mouseness of mouse,' meaning it is associated with normal mouse behavior and helps define the species' unique characteristics," Garner said.

Garner suggests that letting mice regulate their own temperatures by building nests might be more effective than trying to alter room temperatures. The team also speculates that nests are a form of protection for lab mice, allowing them to hide from light and humans. Garner contends that by allowing lab animals to perform behaviors that reduce stress, they are more normal research models.

"Ultimately, we want to know whether it could be beneficial for scientists to encourage behaviors such as nest building so that mice are less stressed, healthier, less anxious and more successful in their breeding," Garner said.

Garner's research efforts in this area netted him the 2008 Professor William Russell Fellowship from the Universities Federation for Animal Welfare. The three-year fellowship supports research that makes

significant contributions to the welfare of animals used in science.

Provided by Purdue University