

STANDARD OPERATING PROCEDURE
ENVIRONMENTAL ENRICHMENT FOR SWINE
USED IN RESEARCH AND TEACHING

1.0 PURPOSE:

- 1.1 This standard operating procedure (SOP) describes the methods for environmental enrichment of swine (*Sus*) used for research and teaching purposes.
- 1.2 These methods are intended to improve the well-being of these animals by increasing species-specific behaviors and reducing maladaptive behaviors.
- 1.3 This SOP is part of the UGA Environmental Enrichment Program that fully complies with the requirements of the National Research Council, *Guide for the Care and Use of Laboratory Animal*, ed8 available at <http://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf> and the Animal Welfare Act and Regulations: Public Law 99-198 – The Improved Standards for Laboratory Animal Act available at <http://www.nal.usda.gov/awic/legislat/awa.htm> .

2.0 STANDARDS:

2.1 Natural Behavior:

Sus scrofa includes the domestic pig and the common Eurasian wild boar, both commonly referred to as porcine. Pigs are native to all but the harshest of climates. Pigs are omnivorous and can exist in virtually any productive habitat with enough water to sustain large mammals. They eat primarily leaves, grasses, fruits and flowers. In their natural habitat, they spend much of their day foraging. In confinement, they are most commonly fed corn and soybean meal with a mixture of vitamins and minerals. Pigs were domesticated some 5000 to 7000 years ago. Pigs are highly intelligent and very social, forming complex hierarchies within their groups. (Angier, 2009) Housing a pig in a stable social group with ample space and environmental complexity enables them to adjust their proximity to different individuals according to their social relationships and current state. Pigs have a wide range of vision, about 310 degrees but may have problems with focus. They have a keen sense of smell and well-developed hearing. They also communicate extensively through vocalizations and olfactory pheromones. (Blackshaw, 2013)

2.2 Environmental enrichment must be evaluated by taking into account the following:

- 2.2.1 The Natural Behavior and needs of swine (see above)
- 2.2.2 Social Enrichment – Housing of compatible co specific offers a high level of enrichment. Every effort will be made socially house social species. If social housing is not possible, animals should be housed in a manner that allows for as much tactile, auditory, visual or olfactory contact as possible. Social housing is a recognized and important part of the Environment Enrichment Program but should not be viewed as the sole means of meeting the enrichment needs of animals.
- 2.2.3 Physical Enrichment (devices, toys, etc) – Physical enrichment can be an important part of the Environmental Enrichment Program. However the selection of physical enrichment should take into account the safety of the device, its ability to stimulate and maintain the animal’s interest and its impact on the research being conducted. Physical enrichment should be carefully monitored to assess its impact of the goals of increasing natural behaviors.

2.2.4 Activity/Food Enrichment – Activity/food enrichment can be an important part of the Environmental Enrichment Program. However, the selection of activity/food enrichment should take into account the health of the animal, the limitations of its confines and its impact on the research being conducted. Any activity/food enrichment should be planned in consultation with the Attending Veterinarian (AV) and the Principal Investigator (PI).

2.3 The enrichment program is carried out by University Research Animal Resources (URAR). Specific needs and requirements should be communicated to the Assistant Director of the Animal Resources (AR) Unit.

2.4 Unless specifically justified by the PI in the Animal Use Proposal (AUP), all animals will receive enrichment. It is recognized that animal enrichment can be a research variable. In caring for the psychological well-being of animals, it is important to recognize limitations and use a balanced approach in providing the best possible care and allowing for the expression of species-typical behavior within a functioning research environment.

2.5 Abnormal Behaviors:

The Environmental Enrichment Program is a dynamic process. Ongoing evaluation is a necessary component to meeting the goal of more species-specific natural behaviors. University Research Animal Resources (URAR) will regularly monitor all enrichment, in part, by looking for stereotypical behaviors that might indicate animal stress or maladaptation to the laboratory environment.

Abnormal behaviors in swine include:

- Tail biting
- Rubbing nasal secretions on the floor or other pig
- Bar biting
- Polydipsia (chronic excessive thirst)
- Apathy and Anorexia

When these behaviors are observed, URAR will evaluate the need for additional environmental enrichment. All changes to enrichment will be approved by the AV and the PI. Enrichment changes will be made for all animals on study, in order to minimize research variability, even if all of the animals are not showing the stereotypical behavior.

3.0 PROCEDURES:

3.1 Social Enrichment – As a social species, swine social housing will be considered the default method of housing unless otherwise justified based on social incompatibility resulting from inappropriate behavior, veterinary-related concerns regarding animal well-being, or scientific requirements approved by the UGA Institutional Animal Care and Use Committee. If pigs cannot be housed together, every attempt will be made for defined group interactions. Positive human interaction will be provided by Animal Care Staff on a regular basis.

3.2 Physical Enrichment - in order of preference

3.2.1 Complex pens with spatial separation for lying, feeding and excretion

3.2.2 Low volume radio if noisy environment

- 3.2.3 Nesting material of long straw for farrowing sows
- 3.2.4 Toys for snout exploration (e.g. old tires, empty milk jugs) 1 toy/pig/week – changed weekly to prevent boredom
- 3.3 Activity/Food Enrichment - in order of preference
 - 3.3.1 Roller bar feeder designed to encourage rooting behavior
 - 3.3.2 Complex, changeable, manipulatable, destructible objects that are ingestible or contain sparsely distributed edible parts (e.g. corn mixed in compost, turf or branches, long straw, corn on the cob)
 - 3.3.3 Treats (e.g. fruit, vegetables) Note: Pigs are often on food restriction and treats should be accounted for.

4.0 RECORDS:

The Animal Care Staff will log provision of enrichment daily according to their facility specific documentation records.

5.0 DEFINITIONS AND REFERENCES:

5.1 Definitions:

- 5.1.1 Animal Use Proposal (AUP): a detailed written description of the procedures involving the use of animals in a research or instructional project.
- 5.1.2 Attending Veterinarian (AV): the veterinarian responsible for the health and well-being of all laboratory animals used at the institution
- 5.1.3 Enrichment: a method of providing animals with the opportunity to behave as they do in the wild, playing, foraging, grooming, and interacting in other ways with one another.
- 5.1.4 Principal Investigator (PI): the scientist who plans and coordinates all phases of the research or instructional work and the protocol.
- 5.1.5 Standard Operating Procedure (SOP): a set of standardized instructions for dealing with routine laboratory procedures

5.2 References:

Angier, N. (2009) *Pigs Prove to Be Smart, if Not Vain*. The New York Times

Animal Welfare Act and Regulations: Public Law 99-198 – The Improved Standards for Laboratory Animal Act (<http://www.nal.usda.gov/awic/legislat/awa.htm>)

Blackshaw, J. (2013) *Behavioural Profiles of Domestic Animals*: Pigs at <http://animalbehaviour.net>

Federation of Animal Science Societies, Guide for the Care and Use of Agricultural Animals in Research and Teaching, ed. 3 available at www.fass.org/docs/agguide3rd/Ag_Guide_3rd_ed.pdf

Merck Manual at <http://www.merckmanuals.com/vet/behavior.html>

National Research Council, *Guide for the Care and Use of Laboratory Animals*, ed 8 available at <http://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf>