

The Value of Environmental Enrichments to Gestating Sows

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Summary and Implications

Housing swine in unstimulating environments can lead to increases in abnormal and harmful social behavior, stress and impaired immune function. Environmental enrichments can alleviate the negative impacts of unstimulating housing and can improve sow welfare. In a series of studies, we asked sows which enrichments they found most valuable. Behavior and motivation measures revealed that sows valued access to an enriched group pen, though sow social status impacted enrichment use. Rubber mats were preferred and shared in a group pen, though were not as highly valued by individual sows. Stall-housed sows valued compost in a trough and straw in a rack, though showed little interest in a hanging cotton rope. The addition of enrichments, which sows find valuable, to unstimulating environments should be considered as a method to improve sow welfare.

Introduction

Gestation sow housing is a growing consumer, legislation and industry concern. Gestation stalls have been banned in several U.S. states due to concerns for animal welfare. However, stall use is still permitted for breeding, implantation and farrowing/lactation. European countries are adopting more “welfare-friendly” housing alternatives for swine, such as group housing and the provision of environmental enrichments. However, not all enrichments are beneficial and valued by swine. Therefore, our objective was to identify which enrichments sows valued using motivation and behavioral measures. This information can help scientists and producers determine economical and effective methods to improve sow welfare on farms.

Materials and Methods

A total of 120 Landrace x Yorkshire gestating sows were tested in a series of studies. The value of enrichments (rubber mat, cotton rope, straw in a rack and compost in a trough) to sows housed in groups (Figure 1) or individual stalls was determined using motivation and behavior

measures. Sows accessed enrichments by pressing an operant panel with their snout (Figure 2) and were permitted to interact with enrichments for ~21 h. In group-housed sows, social status was determined using food competition tests. In individually-housed sows, the motivation for a single enrichment was tested against controls (food or an empty trough). Data were analyzed as a GLM or REML and are presented as raw means \pm S.E.

Figure 1. Schematic of the enriched group pen (top) and sow feed/test stalls (bottom).

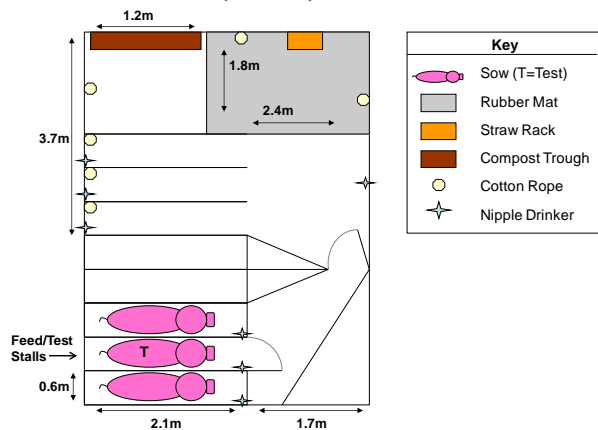
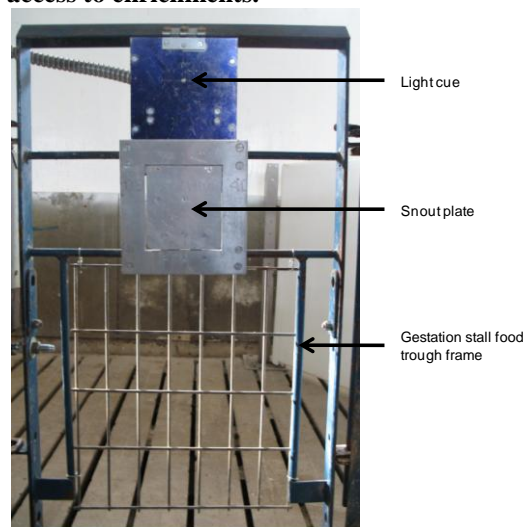


Figure 2. Operant panel used to test sow motivation for access to enrichments.



Results and Discussion

Dominant and subordinate sows valued access to an enriched group pen (containing all enrichments), though behaved differently during the first 30 min in the pen due to social status (Table 1), where dominant sows showed higher

aggression and monopolized access to enrichments compared to subordinates.

Table 1. Sow behavior during the first 30 min in the enriched group pen.

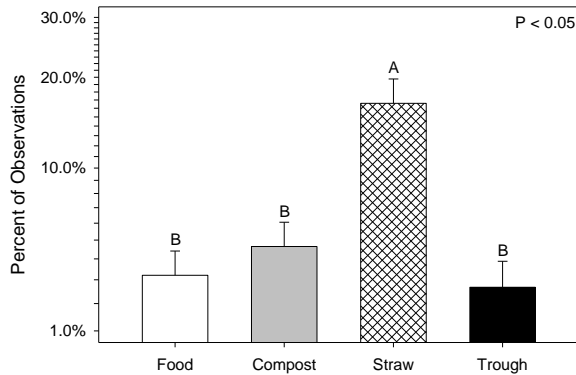
Behavior	Dominant	Middle	Subordinate
Aggression	0.61 ± 0.29 ^a	0.13 ± 0.06 ^{a,b}	0.06 ± 0.03 ^b
Enrichment Use	54.58 ± 6.02 ^a	49.89 ± 5.82 ^a	29.57 ± 5.56 ^b
Inactive	37.44 ± 5.51 ^a	40.98 ± 5.38 ^{a,b}	59.82 ± 6.23 ^b
Locomotion	5.62 ± 0.82 ^a	7.95 ± 1.14 ^a	7.98 ± 1.10 ^a
Other	1.75 ± 0.49 ^a	1.05 ± 0.33 ^a	2.57 ± 0.59 ^a

^{a,b} Means within a row without the same superscripts differ (P < 0.01).

However, subordinate sows compensated for early low enrichment use (~20% of time) by increasing their use the next morning prior to feeding (~50% of time; P < 0.01). Sows preferred to rest on a rubber mat compared to other areas of the pen (P < 0.05) and social status did not impact mat use (P > 0.05); demonstrating that rubber mats may be a good enrichment for group-housed sows.

In a separate study, the value of enrichments to individually stall-housed sows was investigated. We found that sows valued access to compost in a trough (as demonstrated by motivation data, P < 0.05) and straw in a rack (as demonstrated by behavior data, P < 0.05). When provided with straw, sows spent more time interacting with straw compared to all other treatments (Figure 3).

Figure 3. Straw use by stall-housed sows.



However, stall-housed sows did not value access to a rubber mat or a hanging cotton rope, as demonstrated by motivation and behavior measures (all comparisons, P > 0.05). Combined, these studies demonstrate that sows valued access to enrichments, in particular straw and compost. In addition, rubber mats appear to be a good enrichment for group-housed sows and are preferred for resting.

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