

Barrow and Gilt Vocalizations During a Human Approach Test

Sarah J. Myers, Jessica D. Colpoys, Anna K. Johnson

Department of Animal Science, Iowa State University, Ames, IA

Introduction

- Swine vocalizations can be useful for interpreting emotional states
- In pigs, it is generally assumed that low-pitched vocalizations (<1000 Hz) maintain social contact and high-pitched vocalizations (≥ 1000 Hz) indicate stress in males (Fraser, 1974; Schrader and Todt, 1998)
- During a human approach test, gilts expressed more stress behaviors than barrows (Colpoys et al., 2015)
- However, it is unknown if low- and high-pitched vocalizations differ between barrows and gilts during a human approach test
- The objective of this study was to investigate differences between barrow and gilt vocalizations during a human approach test

Materials and Methods

- 20 barrows and 20 gilts were tested using a human approach test (HAT)
- Pigs were individually tested within a novel arena for 10 minutes between 1300 and 1900 hours (Fig. 1)
- Digital audio recordings of pig vocalizations during HAT were captured with a Marantz recorder
- Raven software (Fig. 2) was used to identify peak frequency, duration, and number of vocalizations (Table 1)
- Vocalizations were split into two call categories: low-pitched calls (<1000 Hz) and high-pitched calls (≥ 1000 Hz)

Table 1 - Definitions for collected vocalizations

Measure	Definition	Unit
Peak Frequency	Frequency with the highest power	Hz
Duration	Length of the vocalization which contains 90% of the energy	S
Number of Vocalizations	Total number of vocalizations made by the pig during HAT	Count

Results

Low-pitched calls

- No differences were observed between barrows and gilts for peak frequency or duration of low-pitched calls ($P = 0.27$; Fig. 3 and 4)
- Gilts had more low-pitched calls than barrows ($P < 0.01$; Fig. 5)

High-pitched calls

- Gilts tended to have a higher peak frequency of high-pitched calls than barrows ($P = 0.08$; Fig. 3)
- No differences were observed between barrows and gilts in duration of high-pitched calls ($P = 0.47$; Fig. 4)
- Barrows had more high-pitched calls compared to gilts ($P < 0.01$; Fig. 5)

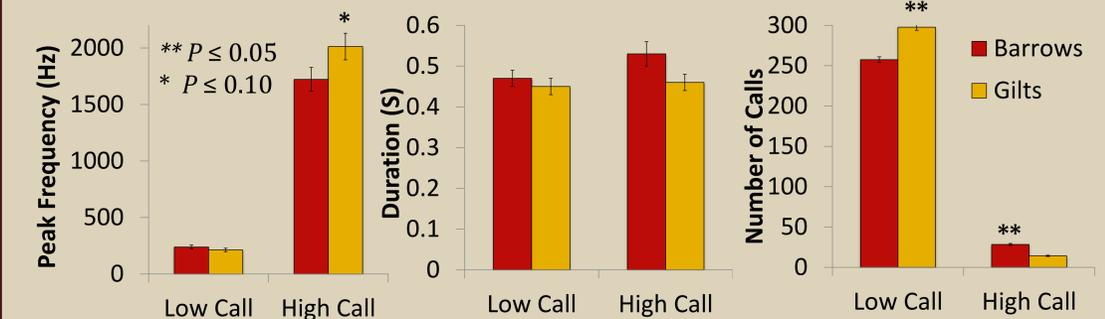


Fig. 3 Peak frequency of low- and high-pitched calls

Fig. 4 Duration of low- and high-pitched calls

Fig. 5 Total number of low- and high-pitched calls

Statistical Analysis

- Data were analyzed using PROC Glimmix of SAS (SAS Institute Inc., Cary, NC, USA)
- The model included the fixed effects of sex and test week, random effect of pen, and covariate of pig age
- The significance level was fixed at $P \leq 0.05$ and tendency at $P \leq 0.10$

Discussion

- These results suggest barrows and gilts differ in their vocal response during a human approach test
- However, the vocalizations displayed by both gilts and barrows indicate a fear response

References

Colpoys, J.D., C.E. Abell, N.K. Gabler, A.F. Keating, S.T. Millman, J.M. Siegford, J.M. Young, and A.K. Johnson. 2015. Feed efficiency effects on barrow and gilt behavioral reactivity to novel stimuli tests. *Journal of Animal Science* 93:In Press.
 Fraser, D. 1974. The vocalizations and other behaviour of growing pigs in an "open field" test. *Applied Animal Ethology* 1:13-19.
 Schrader, L., and D. Todt. 1998. Vocal quality is correlated with levels of stress hormones in domestic pigs. *Ethology* 104:859-876.



Fig. 1 - Human approach test

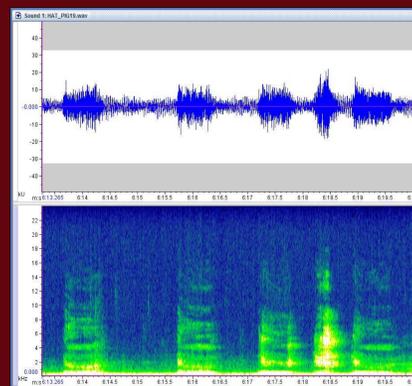


Fig. 2 - Raven software vocalization analysis