# MEASUREMENT OF HUMAN AND ANIMAL RELATIONSHIP IN A SLAUGHTERHOUSE OF FATTENING PIGS USING CO<sub>2</sub> FOR STUNNING

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## I. INTRODUCTION

Pig welfare and meat quality are important factors in the pig industry as they have a direct impact on production costs. Over the past few years, an increased focus on evaluating animal welfare in slaughterhouses [1]. Human-animal contact during transport and slaughter procedures for fattening pigs is crucial for the emotional state and appropriate behavior [2]. After the pigs leave the lairage, they are moved into the stunning chamber. This process involves an interaction between the animals and humans which can be evaluated by vocalizations. It has been hypothesized that high-pitched vocalizations (HPV) emitted by pigs in slaughterhouses can serve as indicators of the underlying animal and human relationship and the stunning method applied. High-pitched vocalizations emitted by pigs in slaughterhouses can provide insight into the nature of the human-animal relationship. This study consisted in the evaluation of the human-animal relationship through the record of vocalizations emitted by pigs when being moved from the lairage to the stunning area.

## II. MATERIALS AND METHODS

Investigators recorded whether any of the observed group of animals vocalized during each 20-second interval (focal sampling) and whether any pig vocalized just at the end of the 20-second interval (scan sampling). The 20-second evaluation periods and focal scanning were carried out during locomotion 12 times per batch. The observations were conducted three times a day to assess three different farm batches in a total of 31 observation days. Vocalizations are presented as the number of times HPV occurred during the first four observation periods (HPV1\_4), the second four observation periods (HPV5\_8) and the third four observation periods (HPV9\_12) concerning 1116 periods of 20 s that comprise the assessment. Spearman's correlation coefficients (P <0.01) were performed to study the relationships between variables.

# III. RESULTS AND DISCUSSION

Table 1 presents correlation coefficients (P <0.01) and correspondent r values for the first four observation periods (HPV1\_4), the second four observation periods (HPV5\_8), and the third four observation periods (HPV9\_12), one vocalization at the end of the 20-second interval, multiple vocalizations at the end of the 20-second interval and absence of HPVvariables studied.

Variables		HPV1_4	HPV5_8	HPV9_12	One Vocaliz.	Mult. Vocaliz.	Absence HPV
					r		
HPV1_4	-		0.259	0.089	0.281	0.011	-0.274
HPV5_8	alue	0.012		0.184	0.351	0.275	-0.392
HPV9_12	ط ا	0.395	0.077		0.075	0.091	-0.093
One Vocaliz.		0.006	0.000	0.474		0.140	-0.957
Mult. Vocaliz.		0.913	0.008	0.385	0.182		-0.378
Absence HPV		0.008	0.000	0.374	0.000	0.000	

Table 1 – Correlation coefficients (P < 0.01) and correspondent r values for variables.

Significant correlations (P < 0.01) and correspondent r values are presented with bold letter.

A significant positive correlation between HPV1 4 and and One Vocalization (r = 0.281, p = 0.006), and between HPV5\_8 and One\_Vocalization (r = 0.351, p < 0.001) indicated that higher occurrence of HPV is also associated with occurrence of stantaneous vocalization in the first and second periods of locomotion for lairage to stunning indication a more stressful phase. Additionally, a significant positive correlation was observed between HPV5 8 and Mult Vocalization, further indicating that higher levels of HPV5 8 are associated with increased instances of Mult Vocalization. Furthermore, there is a significant negative correlation between Non\_HPV and HPV1\_4, suggesting an inverse relationship between Non HPV and the HPV1 4 variable. Non HPV also exhibits strong negative correlations with both HPV5 8 and Mult\_Vocalization, indicating a considerable inverse relationship between Non\_HPV and these variables. According to Dalmau et al. [3] there is a relationship between the stunning system and vocalization parameters (HPV during 20-second interval and vocalization at the end of the 20-second interval). In some slaughterhouses, as the one of this experiment which used CO2, animals are moved to the stunning area with automatic doors that reduce the human-animal interaction and thereby HPV (Figure 1). Actually, in the present study, the occurence of HPV (Figure 1) was low and the vocalization assessement before the stunnig (9\_12) was also the lower. Other studies also confirmed an association between vocalisations and the stunning system when assessed just before the stunning. However, , results can depend more on the way the animals enter the system than on the system itself (i.e. use of automatic doors vs use of an electric prod) [3, 4].



Figure 1. Number of HPV per observation day.

# IV. CONCLUSION

This study evaluated the human-animal relationship through the record of vocalizations. Higher counts of HPV are associated with more focal scanning vocalization, indicating a more stressful phase. Additionally, the use of automatic doors to move animals to the stunning area seems to reduce human-animal interaction. The present study also found a low occurrence of HPV and lower vocalization assessments before stunning.

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