



COULD LOW FREQUENCY CALLS BE INDICATIVE OF STRESS AND NEGATIVE AROUSAL STATES IN CATTLE?

Gavojdian Dinu[#], Mincu Madalina, Ber Vlad, Nicolae Ioana

Research and Development Institute for Bovine, Balotesti, Romania

[#] *Corresponding author:*
gavojdian_dinu@animalsci-tm.ro

• Introduction

Cattle vocalizations have been recently proposed as potential animal-based indicators of animal welfare.

In dairy cattle, low frequency calls (LFCs) tend to be associated with positive arousal states, such as dam-calf communication and feed anticipation.

LFCs are sounds emitted by cattle with the mouth closed, generally used for short distance communication.

The **aim** of the current research was to evaluate if LFCs could be indicative of negative arousal states in dairy cows during episodes of isolation.

• Material and method

A number of 10 lactating multiparous Romanian Black and White cows (2nd parity) were separated individually from their herd-mates for 4 consecutive hours, with vocalizations being recorded using Sennheiser MKH416 microphones and Marantz PMD661 recorders.

The acoustic structure of each individual call was analysed using Praat-v.6.0.31 software.

• Results and discussions

Out of the 23 sound parameters analysed, isolation had a significant influence ($p \leq 0.05$) on a number of 4 parameters, namely: Wiener entropy (dB); mean, minimum and maximum frequency values of the sixth formant (F6, Hz); mean, minimum and maximum frequency values of the seventh formant (F7, Hz); and the frequency values at the upper limit of the third quartile (Q75%, Hz).

However, parameters such as: fundamental frequency across the calls (Hz); maximum frequency (Hz); minimum frequency (Hz); peak frequency (Hz); sound duration (s); dispersal (Hz); harmonicity (dB); frequency values at the upper limit of the first (Q25%) and second (Q50%) quartiles (Hz); mean, minimum and maximum frequency values of the first to fifth formants (F1-F5, Hz) remained unchanged during isolation ($p > 0.05$).

• Conclusions

Current results showed that LFCs are less suitable when studying negative contexts such isolation from herd-mates, with just 4 out of 23 parameters being influenced by negative arousal.

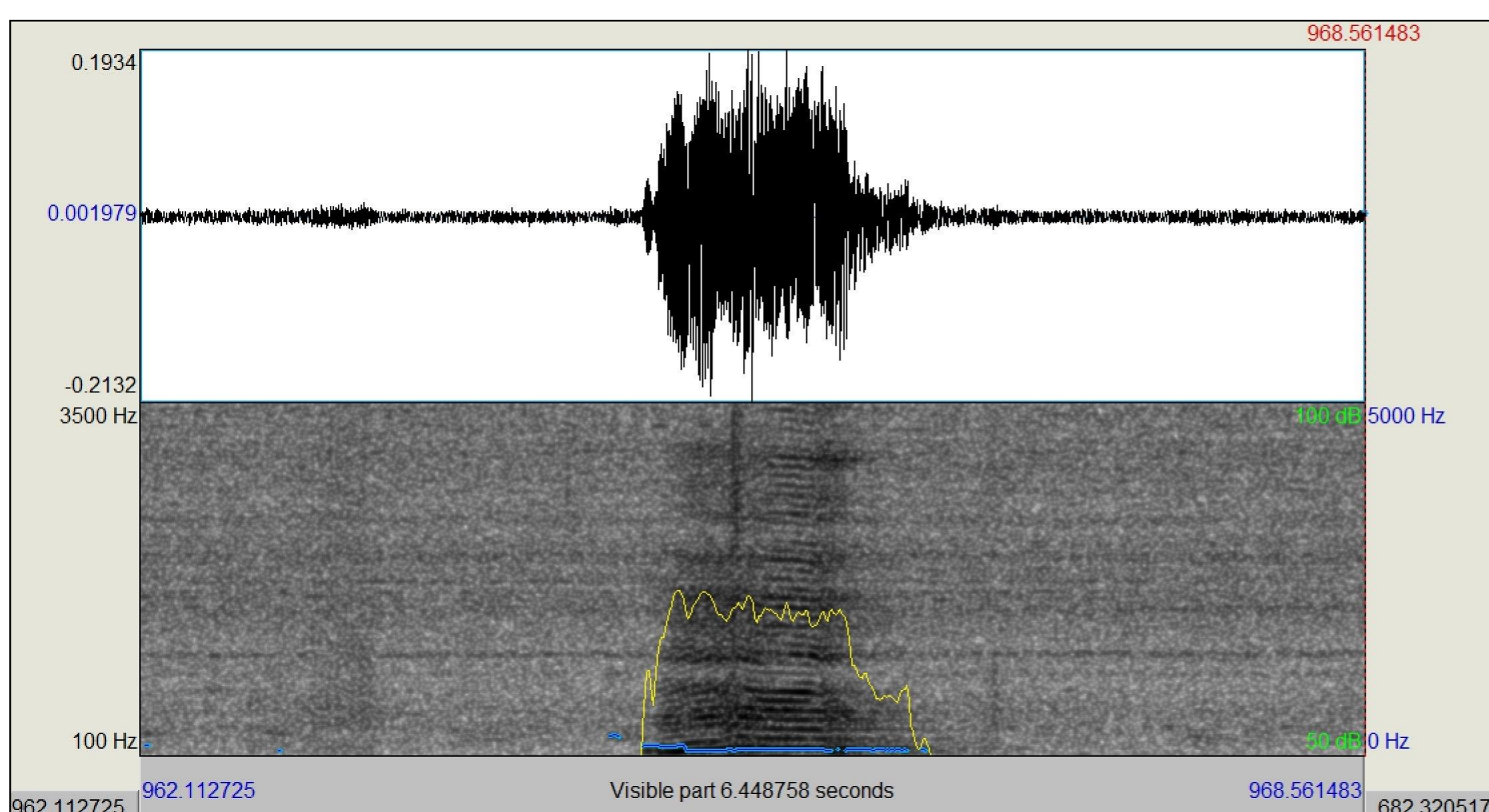


Figure 1. Sample oscillogram (top) and narrow-band spectrogram (bottom) of a low frequency call (LFC) vocalisation

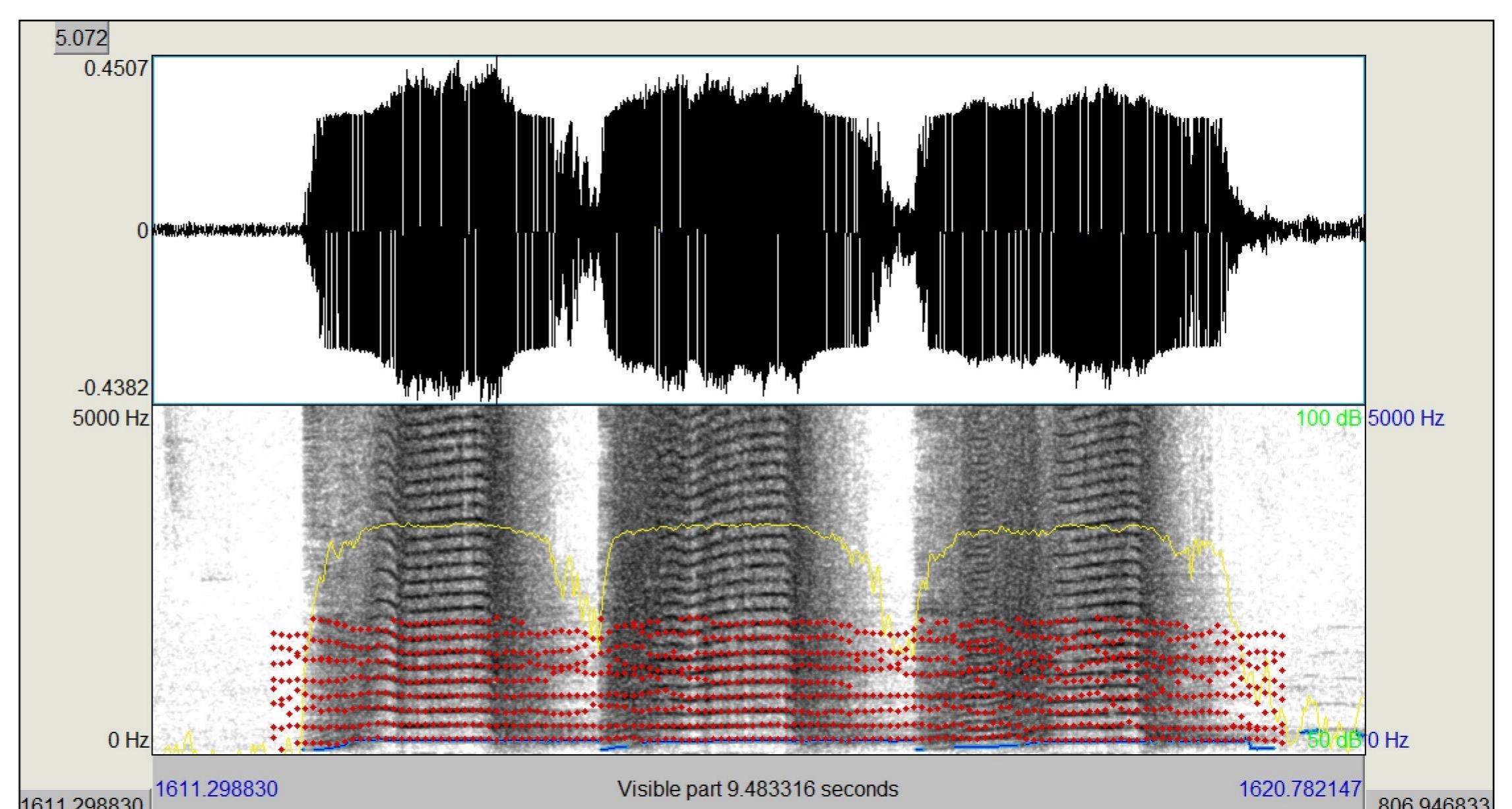


Figure 2. Sample oscillogram (top) and narrow-band spectrogram (bottom) of a high frequency call (HFC) vocalisation