

## The Role of Behavioral Syndromes in Human-Cattle Interactions: A Physiological Approach

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**Abstract :** Positive interaction between people and animals could have a favorable effect on the welfare and production by reducing stress levels. However, to the repeated contact with humans (e.g. farm staff, veterinarians or herdsman), animals may respond with escape behavior or avoidance, which both have negative effects on the ease of handling, welfare and may lead to the expression of aggressive behaviors. Rough or aversive handling can impair health and the function of the cardiac autonomic activity due to fear and stress, which also can be determined by certain parameters of heart rate variability (HRV). Although the essential relationships between fear from humans and basal tone of the autonomic nervous system were described by the authors previously, several questions remained unclear in terms of the associations between different coping strategies (behavioral syndromes) of the animals and physiological responsiveness to humans. The main goal of this study was to find out whether human behavior and emotions to the animals have an impact on cardiac function and behavior of animals with different coping styles in response situations. Therefore, in the present study, special (fear, approaching, restraint, novel arena, novel object) tests were performed on healthy, 2-year old heifers (n = 104) differing in coping styles [reactive (passive) vs. proactive (active) coping]. Animals were categorized as reactive or proactive based on the following tests: 1) aggressive behavior at the feeding bunk, 2) avoidance from an approaching person, 3) immobility, and 4) daily activity (number of posture changes). Heart rate, the high frequency (HF) component of HRV as a measure of vagal activity and the ratio between the low frequency (LF) and HF components (LF/HF ratio) as a parameter of sympathetic nervous system activity were calculated for all individual during lying posture (baseline) and for response situations in novel object, novel arena, and unfamiliar person tests (both for 5 min), respectively. The differences between baseline and response were compared between groups. Higher sympathetic (higher heart rates and LF/HF ratios) and lower parasympathetic activity (lower HF) was found for proactive animals in response situations than for reactive (passive) animals either during the novel object, the novel arena and the unfamiliar person test. It suggests that animals with different behavioral traits differ in their immediate autonomic adaptation to novelty and people. Based on our preliminary results, it seems, that the analysis of HRV can help to understand the physiological manifestation of responsiveness to novelty and human presence in dairy cattle with different behavioral syndromes.

**Keywords :** behavioral syndromes, human-cattle interaction, novel arena test, physiological responsiveness, proactive coping, reactive coping

**Conference Title :** ICASVM 2017 : International Conference on Animal Science and Veterinary Medicine

**Conference Location :** Paris, France

**Conference Dates :** February 23-24, 2017