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Salivary cortisol as a marker of acute stress in dogs. A review

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Stručná anotace k výsledku:

Pracovní psi by v lidské péči měli pocítit co nejmenší míru stresu. Cílem bylo shrnout, zda a za jakých podmínek může být hormon kortizol ve slinách psů využit jako neinvazivní ukazatel akutního stresu. Měření kortizolu jako ukazatele stresu psů má určité nevýhody, které mohou vést ke špatné interpretaci výsledků. Klíčová je standardizovaná metoda odběru a následného zpracování vzorků slin. Dále je třeba při přípravě pokusu, statistickém zpracování výsledků, stanoveních a finální interpretaci výsledků vzít v potaz možné střídání hladiny kortizolu během dne a individuální variabilitu v hladině hormonu. Vzhledem ke komplexnosti stresové odpovědi by mělo být sledování kortizolu ve slinách doplněno o sledování příznaků stresu podle chování.

Řešitelský tým:

manažer, hlavní řešitel

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Salivary cortisol as a marker of acute stress in dogs: a review



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ABSTRACT

Public interest in the welfare of domestic dogs has increased in recent years. Dogs under human care should experience as little stress as possible, and as such it is necessary to measure and quantify their levels of stress. Stress parameters that can be measured noninvasively may help to identify the poor welfare of animals. This review aimed to determine whether and under what conditions the hormone cortisol in dog saliva can be used as a noninvasive acute stress marker. The use of salivary cortisol as a stress marker has some disadvantages, which can lead to data misinterpretations. A key factor is the standardized method of sampling and subsequent processing before analysis. In addition, possible circadian alternation and individual variability of cortisol hormone levels should be consistently considered during the preparation of the experimental scheme, statistical data processing and final interpretation of the results. Because of the complex nature of the stress response, the observation of salivary cortisol should be supplemented with behavioral observations, but it should be noted that behavioral stress symptoms may not always be positively correlated with stress hormone production. Besides behavioral observations, it is advisable to supplement the measurement of cortisol by other salivary stress markers of sympathetic-adrenal-medullary and hypothalamic-pituitary-adrenal pathways. This comprehensive assessment of the stress impact on the individual will enable one to characterize the level and type of stress.

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1. Introduction

Recently there has been increased public interest in the well-being of domestic animals, especially dogs. Discussions on housing and handling problems related to dog welfare will be more objective and meaningful when it is possible to substantiate how dogs appraise suboptimal conditions.

In the situations that animals perceive undesirable, they show behavioral and physiological indications of stress [1]. Stress is a biological response of the body caused by the extraordinary circumstances defined as stressors threatening its natural homeostasis [2,3]. In spite of being widely used in a negative sense, the term stress can also have a positive meaning. There exist 2 types of stress: eustress, a nonthreatening stress, often referred to as a “good stress”, and distress with a deleterious effect called a “bad stress” [4]. Excitement and increased level of arousal are considered physiological indicators of eustress, inducing adaptive responses such as increased alertness, attention, and preparation for activity [5]. The same type of stressor may

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