The examination of biophysical parameters of skin (transepidermal water loss, skin hydration and pH value) in different body regions of ponies

M.P. Szczepanik¹, P.M. Wilkołek¹, M. Pluta², Ł.R. Adamek¹, Z.J.H. Pomorski¹

¹Subdepartment of Clinical Diagnostics and Veterinary Dermatology, Faculty of Veterinary’ Medicine, University of Life Sciences in Lublin, Głęboka 30, 20-612 Lublin, Poland
²Equine Breeding and Management Unit, Department of Biology and Animal Breeding, University of Life Sciences in Lublin, Akademicka 13, 20-950 Poland

Abstract

The purpose of this study was to evaluate transepidermal water loss, skin hydration and skin pH in normal ponies. Sixteen ponies of both sexes were examined in the study. Measurements were taken from seven different sites: the neck region, the shoulder, thorax, lumbar, inguinal, lip region and the auricle. In each of the regions transepidermal water loss (TEWL), skin hydration and skin pH were measured. For transepidermal water loss, the lowest values were observed in the lumbar region (9.71 g/hm²), while the highest values were observed in the lip region (22.35 g/hm²). In the case of skin hydration the lowest values were observed for the thorax region (2.13 CU), and the highest for the lip region (41.81 CU). For skin pH, the lowest results were obtained in the lumbar region (6.93), and the highest in the lip region (7.96).

Key words: skin biophysical parameters, TEWL, corneometry, skin pH, horses

Introduction

A variety of measurements of biophysical parameters, such as transepidermal water loss (TEWL), skin hydration (corneometry), as well as skin pH and erythema intensity have recently been used to complement other methods of examining skin. These non-invasive methods have been widely applied to skin examination in human medicine and, recently, in veterinary medicine, most commonly in dogs (Dirschka et al. 2004, Fluhr et al. 2006, Hightower et al. 2008, Oh and Oh 2009, Hightower et al. 2010, Cornegliani et al. 2012). In human medicine, the parameters have been found useful to examine the skin in atopic dermatitis (Eberlein-König et al. 2000, Choi et al. 2003, Rudolph et al. 2004, Grupta et al. 2008) in order to evaluate the effectiveness of locally applied treatment (Biro et al. 2003, Löffler et al. 2003, Aschoff et al. 2009), and in case of contact dermatitis (Laudanska et al. 2003). Some of these parameters have been studied in veterinary medicine, most commonly in dogs (Beco et al. 2000, Matousek et al. 2002,