

6. Summary

Studies on the size of the equine digital cushion in different hoof shapes

The hoof plays an important role in the wish to maintain a good state of health of the horse used for sports and work. The specific structure of the hoof decreases the strain on the hoof during locomotion so that reduced energy is transmitted to the musculoskeletal system.

The digital cushion located between the hoof cartilages and the endphalanges is one of the impact absorbing components within the horny capsule.

The histological structure of the digital cushion was predominatly examined in further studie whereas a lack of information about ist size and ist relation to the hoof exists.

The aim of the present study was to determine the size of the digital cushion and considering the influence of different hoof shapes.

Therefore one median and three following transverse sawcuts were on 24 regular, eight hooves with obtuse and eight hooves with acute hoofangles performed and the digital cushion was measured afterwards.

According to the high individuality of the hooves it is very difficult to find a method that allows the determination of the cushions size. Furthermore it is important to establish certain criteria allowing comparison of the measurements between several hooves.

The present results show that a lot of factors are involved in the formation of the digital cushion, so that the horny capsule gives only limited clue to the size of the cushion.

Despite the small sample size it can be assumed that the formation of the digital cushion, especially its wideness, is related to the hoof size, although it has to be considered that the development of the blood vessel containing soft tissue and the thickness of the hoof cartilages varies between the hooves and may therefore limit the sideways expansion of the digital cushion.

The height of the digital cushion is influenced by the distance from the frog to the ground, the frogs central sulcus and the hoof angle.

The horny frog is decisive for the part of the digital cushion located inside the frog, while the horns thickness has to be considered.

A more precise statement about the relation between hoof and digital cushion has to be performed with the determination of volumina of both bodies.

Therefore the attempt of isolating the digital cushion by preparation has been made, and the digital cushion was then measured by water replacement method.

Another approach has been the computer assisted calculation of the cushions volume by the means of magnetic resonance images of the hoof.

Both methods of volume measurement showed difficulties in differentiation of adjacent structures, which led to inaccurate results

The results of all three named methods are listed in the present study.