

Comments to elephants performing in circuses

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The body of an elephant is not constructed to do the tricks they have to do in a circus. Most of the circus tricks are a risk to the animal's health by straining the joints and tendons. This leads to pain, inflammation and swelling and can lead to lameness and other locomotion problems. In addition degenerative joint diseases can occur.

The elephant specialist A. Kuntze (1989) claims that the sitting position can lead to serious problems and even death, if a intestine -, uterus - or a bladder prolapse becomes constricted and necrotic. Many different functional problems occur if elephants are forced into unnatural positions, which demand constant pressure or too great a strain.

If an elephant is forced into an unnatural position e.g. head stand, standing on hind legs or kneeling, this harms the health of the animal, according to zoologists of the Tiergarten Schönbrunn in Vienna. (Schwammer et al. 1996). These positions can lead to joint and vertebra injuries and to split nails. Balancing acts can lead to problems in the elbow and knees.

Lindau (1970) confirms that tricks, such as standing on one leg or building a pyramid, leads to premature wear and tear of the joints, tendons and limbs in elephants. He further confirms that forced positions on the front or hind legs can lead to lameness and is especially dangerous for young animals. Even elephant trainers confirmed that especially standing on two legs imposes danger to the animal.

The pillar-like hind legs of elephants differ from most mammals. Thigh and lower leg stand vertical on top of each other at 180° in order to relieve the tendons, muscles and joints of the great weight. The knee of the elephant is similar to the human knee (Weissengruber et al. 2006a). The group at the Veterinary Institute of the University of Vienna postulate that bending and stretching are the main movements of the knee, reaching an angle of 142° . The special structure of the elephant knee developed during evolution to carry 40% of the enormous weight of the animal. If an elephant has to stand on its hind legs the entire weight of the front body and head (additional 60%) also comes to rest on these and this is an enormous strain for the joints, muscles and tendons, as well as the fine knee structure and leads to premature wear and tear.

The same group in Vienna studied the foot and foot cushion of the elephant (Weissengruber et al. 2006b). If one looks at the position of the foot bones, it is clearly visible that elephants do not walk on their entire sole like humans or on their tip toes like horses, but something in between. Between bones and sole lies a thick cushion, comprising compartments of fat and collagen, to distribute and absorb the weight. This foot cushion is highly specialized to ensure pain free locomotion. This cushion expands and constricts as the animal walks.

In addition the foot is a sense organ (Weissengruber et al. 2006b). The subcutis of the sole is rich in tightly packed Vater - Pacini sensory cells and Meissner corpuscles. The first are vibration sensors

allowing the elephant to pick up vibrations in the ground, such as distant thunder, ultrasound calls from conspecifics, earth quakes and tsunamis; the latter allow sensitive feeling of the ground.

The sensitive and complicated foot of the elephant causes the many foot problems known from captivity. Tiny cracks in the sole, nails or skin around the nails can easily become infected with bacteria and result in abscesses (Benz 2005).

Elephants have relatively weak muscles, and do not have the strength that a layman would assume they have. Muscle strength does not grow proportionally to body mass. The cross-section of the relevant muscles is important (Kurt 2008), and these are smaller the heavier the animal is. Therefore the strain on muscles, tendons and bones is especially great when the animal stands on two feet, or part of its body (e.g. head, one leg).

In principle the tricks that elephants have to perform should conform to their natural behaviour and postures seen in wild elephants (Barnhard & Hurst 1006).

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