

Incredible Science (10):

From the secret archives of the IgNobel committee

Ice-cold Penis Bones

In 2004, *Oikos* (vol. 105:255-267) printed an article on the laborious task of proving that mammals living in high latitude environments have longer penis bones (= *baculum*) than the "lowlanders".

The authors gave three reasons for this phenomenon.

Firstly, due to little food, the animals are dispersed more widely in the mountains and, additionally hampered by snow, only rarely come across each other. The subsequent lack of rendezvous results in an insufficient frequency of copulation. Hence, high quality is the only way to achieve an efficient mating success. Animals equipped with a longer penis bone definitely have a greater advantage, and not only because the sperm can enter more deeply. At the same time, the sperm of a potential forerunner is mechanically displaced in a piston-like manner.

Secondly, this sperm displacement only makes sense because many female mammals are able to delay the implantation of egg cells by more than a month as an adaptation to the inhospitable environment at high latitudes. Eggs are only implanted during periods of improved weather and it is this variable delay that actually permits copulatory competition.



The author, Mark Benecke, is Co-Editor of the *Annals of Improbable Research* that annually presents the IgNobel Awards in Cambridge, USA

Thirdly, in 1979 it was suggested for the first time, that a longer baculum might also elicit higher sexual arousal in female animals. However, nothing is really known about this aspect since minks, wolverines, black bears or skunks are reluctant co-operators when it comes to performing apt studies in this respect.

In any case, the authors, Steven Ferguson and Serge Larivière, earned themselves a bonus point for their diligence. They analysed data from no less than 13,332 meteorological stations, determined water demand or rather water consumption of the animals, and furthermore included altitude, snowfall, size and density of populations, as well as polygamy and monogamy. Altogether, the result was that penis bones shrink in relation to the whole body mass if males have access to many females. Conversely, the more male competitors rival for the females (multi-male mating), the higher the tendency is for longer penis bones.

By the way, the penis bone is also significantly longer in mammals that copulate in the sea (the walrus holds the record at 56 cm) because the salt of the sea water could damage the sperm cells. Thanks to the long baculum, however, the sperm get safely to where they belong.

IgNobel's final assessment: Numerous birds killed with one penis bone; therefore my personal favourite for the 2004 IgNobel in biology. However, this was ultimately beaten by a study showing that herrings apparently communicate by farting!