## **Dog Fluid Mechanics**

Written by Administrator Thursday, 10 January 2013 23:37 -

Dog fluid mechanics described in ABC (Australia) News in Science 15 Nov 2010. Engineers and physiologists at Georgia Institute of Technology have used high speed video to analyse how dogs and other furry animals shed water from the fur by shaking their bodies. They found the shaking begins at the head, providing a solid point for an energy wave to be propagated along the body. Dogs have loose skin so the shaking makes the skin rotate faster than the body movement and then whip back as the animal changes direction, like someone cracking a whip. The researchers also found small animals must shake more rapidly to generate sufficient force to expel water from their fur. Andrew Dickerson, from the School of Mechanical Engineering who led the research, explained: "Small animals must shake faster because they have a smaller radius, and would not be able to generate sufficiently high accelerations on the water trapped in their fur if they shook at frequencies of large animals. "This is analogous to a merry-go-round. Sitting in the centre, you experience little force on your body. As you move outwards, the force you feel pulling you outwards increases." Some small animals can generate up to 20g of acceleration. The scientists suggest water is most easily shed from straight, oily hair with sharp tips. This matters for wild animals as being able to dry off is important in maintaining body temperature.

Young-Hui Chang of the School of Applied Physiology, one of the researchers, commented: "The ability to shake off water is certainly a common trait shared among many mammals and the fact that this behaviour appears to be predicted by a fairly intuitive physics model makes it even more appealing." The research findings could help engineers design better spin dryers, painting devices, spin coaters and other machines. David Hu, another of the researchers, commented: "It's surprising, but we still do not understand why washing machines work so well. The equations that govern the fluid motion inside them are too complicated to solve. In this research, we decided to look to nature to ask the question: 'How do we dry clothes effectively and efficiently?'"

## <u>ABC</u>

**Editorial Comment**: If this research does help engineers to design better washing, drying and spraying machines it will be because intelligent scientists used their brains to observe doggies do their thing, learn from it, and apply it in a creative way. The comment about what kind of fur sheds water more easily is interesting as wild canines, such as wolves, have this kind of coat. They dry themselves easily without any human care, unlike the domestic dogs that have been bred from the wolves by humans to possess long or curly hair which is a disadvantage in the wild. Despite Dawkins and others using dog breeding as examples of evolution, such loss of fitness caused by human breeding is actually degenerate devolution. (Ref. physics, design, mammals)

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