

# More Realistic Biomechanics In New Computer Locomotion Model

March 26 2010, by Ted Goodman

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This guinea fowl negotiates uneven ground with ease because its legs keep it stable and absorb the bounce of its body. Credit: James Usherwood

(PhysOrg.com) -- No one has ever won a race on peg legs if they were running against others with flexible legs. But, until now, mathematical locomotion models predicted that stiff legs were the most efficient.

Observation alone tells us those locomotion models cannot be right, particularly because humans, and many [animals](#) known for their running skills, have legs and bodies that bounce - an elastic energy.

An integrative physiologist, Monica Daley, at the Royal Veterinary

College in Hatfield, U.K., noticed the agility of the African guinea fowl and how it was able to maneuver difficult terrains, like sudden drops and other obstacles with such grace. Certainly the guinea fowl, with its 'crouched, compliant motion,' has a more efficient style of movement than stiff-legged animals would have.

Daley and her colleague, James Usherwood, designed a new kind of [locomotion](#) model, one that took the complexities of movement, like the shape of an animal's body, its 'seesawing guts,' the spring in its steps, and the nature of the terrain into consideration.

Daley and Usherwood found through their model that even in animals whose bodies were not efficient for running, compliant legs offset the bounce of their bodies and helped them conserve energy. Additionally, those [legs](#) protected them from falling or injury when hitting rough terrain.

Next, Daley will be testing the new model, published in [Biology Letters](#), on a wide spectrum of [running](#) birds in the wild.

**More information:** [Dr Monica Daley research page](#)  
via [Science](#)

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