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Understanding Trade-offs in Lizards

Trade-offs among locomotor performance, reproduction, and immunity in lizards

In this publication, Biologists Jerry Husak, Haley Ferguson and Matthew Lovern test the idea of trade-offs in both adult and juvenile lizards undergoing diet restriction and exercise.

Organisms have to utilize the resources in their particular environment in order to achieve reproductive success. Past studies suggest that there is a trade-off among traits.

This study pertains to humans because we have similar stress responses as well as a limited amount of energy to expend on various functions so it is possible some of the same results would present themselves in humans.

According to Dr. Lovern "Since energy is finite, you only have so much to allocate to different function (growth, reproduction, immunity, etc.)".

Multiple variables were tested for including growth in mass, swelling response with phytohemagglutinin (PHA),percent of bacteria killed by blood, and reproductive investment.

Among their findings this group discovered the number of eggs laid by an adult female lizard to be significantly less in those with restricted diet. In accordance with the females, the data showed the mass of male testis to be reduced with diet restriction.

Another significant finding from this publication is in regards to swelling of PHA. The data collected revealed juvenile females have the largest swelling of PHA.

What does PHA swelling even mean? This enlargement is a way to quantify immune system responsiveness. The larger the amount of swelling, the greater the organism's immune response.

When asked his thoughts on why this result occurred, Lovern explained "Juvenile females are not breeding so they don't need energy for that."

He went on further to reveal that female growth rate is not as fast as males. This could mean less energy going into growth and more energy for an immune response.

The correlation between extra energy and PHA swelling as well as reproductive investment supports the idea of trade-offs in lizards. While each organism is different, this finding suggests that there could be similar trade-offs in humans.

Dr. Lovern mentioned his interest in the potential effects of leptin as a possible future study, but there are innumerable variables that could be manipulated to further test the correlated trade-offs in these ectotherms.

Husak, Jerry & A. Ferguson, Haley & Lovern, Matthew. (2016). Trade-offs among locomotor performance, reproduction, and immunity in lizards. Functional Ecology. 30. n/a-n/a. 10.1111/1365-2435.12653.