NATIONAL CENTER FOR CASE STUDY TEACHING IN SCIENCE

A Delicate Balance:

Resource Allocation, Immunity, and Disease

by

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Preparation

During the next course instruction time, we will be focusing on resource-based trade-offs in wildlife populations. This preparation assignment is for you to reacquaint yourself with the background knowledge we will be discussing in the case study. Please briefly answer the following questions and then complete any readings assigned by your instructor from the list below.

Questions

1. Define *metabolic rate*.

2. Are there different types of metabolic rates? For example, can metabolic rate be measured at different states (resting, activity, etc.)? Explain.

3. How do food resources translate to energetic "currency"?

4. Can you explain the difference between acquisition of resources and allocation of resources?

5. What factors (environmental, seasonal, etc.) impact food resource availability? How?

6. How does immune function or response relate to an animal being susceptible to a disease?

Readings

Norris, K. and M.R. Evans. (1999). Ecological immunology: life history trade-offs and immune defense in birds. *Behavioral Ecology* 11(1): 19–26. <https://doi.org/10.1093/beheco/11.1.19>

Moreno-Rueda, G. (2011). Trade-off between immune response and body mass in wintering house sparrows *(Passer domesticus)*. *Ecological Research* 26(5): 943–7. <https://doi.org/10.1007/s11284-011-0848-x>

Brzęk, P. and M. Konarzewski. (2007). Relationship between avian growth rate and immune response depends on food availability. *The Journal of Experimental Biology* 210(13): 2361–7. <https://doi.org/10.1242/jeb.003517>

Bize, P., R. Piault, J. Gasparini, and A. Roulin. (2010). Indirect costs of parasitism are shapred by variation in the type of immune challenge and food availability. *Evolutionary Biology* 37(4): 169–76. <https://doi.org/10.1007/s11692-010-9092-5>

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