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The nature of nutrition. A unifying framework from animal adaption to human obesity.

Director's School Seminar Series.

Wednesday 7 March 2012 1pm

Stephen J Simpson School of Biological Sciences, The University of Sydney

Slatyer Seminar Room, R N Robertson Building (#46)



Nutrition touches all aspects of biology – indeed the fundamental, interlinked triumvirate in biology is sex, death and nutrition.

But nutrition is complex. Animals require numerous nutrients in particular amounts and ratios to maximise fitness. Nutrients come packaged in various ratios and concentrations in foods, which are scattered throughout the environment in time and space and may contain toxins and other non-nutrient compounds. The animal must match its multidimensional, changing nutritional requirements while minimising the costs of locating, ingesting and processing appropriate foods.

We have developed a set of state-space models called the Geometric Framework (GF) to capture the multidimensional nature

of nutritional requirements, the relative values of foods in relation to these requirements, the behavioural and post-ingestive responses of animals when feeding on diets of varying composition, and the growth and performance consequences of being restricted to particular dietary regimes. We have also derived the necessary theory for defining fitness in relation to nutrient intake, for describing key nutritional traits and assessing trade-offs between life-history responses.

I will begin by introducing the models and then show how they have been used to address problems in life-history theory, immunity, human health, collective nutrition and community ecology. Along the way I will use examples spanning slime moulds to humans.

Presented by

Research School of
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