

Picky predators need a balanced diet

Natural Environment Research Council

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Everyone knows a balanced diet is good for you. Now scientists have discovered that this is as true for insects as for people.



The ground beetle *Anchomenus dorsalis*.

A UK-led team of researchers has found that predatory ground beetles pick their prey based on nutritional value, and not just on calorie count. It seems the creatures actively choose a balanced diet to give themselves the best chance of producing more offspring.

The team of researchers, from the universities of Oxford and Exeter in the UK, and universities in Australia, Denmark and New Zealand, focussed their studies on the carnivorous ground beetle, *Anchomenus dorsalis*.

This common garden insect preys on slugs, aphids, moths, beetle larvae and ants. And – as the name suggests – many ground beetles spend their time on the ground. Only a few can fly. This is because their wing cases are fused together, acting like protecting armour.

Earlier studies by other scientists have revealed that insects that don't eat meat, like grasshoppers, fruit flies and crickets, are adept at choosing food that gives them a balanced diet.

'What this shows is that these beetles aren't just going on a calorie count. They're regulating their nutritional intake to produce the most eggs.'

Dr John Hunt, University of Exeter

'They don't have to catch their food, so they have the luxury of choice,' explains Dr

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John Hunt from the University of Exeter, a co-author of the study, published in *Proceedings of the Royal Society B*.

But scientists thought predators were a special case, and that these insects simply packed in as many calories as possible. This latest study suggests it's not as simple as that.

'Researchers have assumed predators take advantage of whatever prey they can catch, rather than regulating their diets to get a nutritional balance,' says Hunt.

The team divided a group of female beetles into two. They offered one group the option of eating foods rich in either protein, fat or both. But the other group weren't so lucky. They were given food that was either protein-rich or high in fat. Neither diet provides the beetles with the right nutritional balance.

The researchers found that when offered the chance to feast on prey rich in either protein, fat or both, the first group of beetles sensibly chose a balanced diet with a mixture of protein and fat. What's more, these females ended up producing more eggs than those given an unbalanced diet.

'I was surprised at how good insect predators are at regulating their intake. But what this shows is that these beetles aren't just going on a calorie count. They're regulating their nutritional intake to produce the most eggs. They still have to get a nutritional balance, just like all animals do,' says Hunt.

'The proportions of fats and proteins they chose to eat maximise egg production,' says Dr Kim Jensen from the University of Exeter, lead author of the study.

Hunt explained that he doesn't think the insects make a conscious decision to vary their diets. Instead, what they eat could be controlled by hormones or other physiological mechanisms. And while the study focussed on ground beetles, the findings are likely to be true for other insect predators.

'Biologists have previously assumed that predators cannot afford to be fussy and that they are simply focussed on getting the right quantity of food, rather than quality. We show that they do actually select foods that will give them the right balance of nutrients,' adds Jensen.

This is the first time scientists have shown that predators select food based on its nutritional value.

'Selective foraging for specific nutrients in this predator maximises its reproductive performance,' write the authors in their report.

'The next thing would be to extend this study to other insect predators,' says Hunt.

[SOURCE](#) [1]

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