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TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

Happy wife, happy life
How male robins know what to feed their mate

A VICTORIA UNIVERSITY OF WELLINGTON SCIENCE TEACHING RESOURCE

WHO?

A team of researchers, led by Victoria University of Wellington's Dr Rachael Shaw

WHAT IS THE QUESTION?

When a mated pair of birds are incubating eggs, the male's usual role is to find and bring food to the female so that she does not need to leave the nest. The researchers wanted to know whether the males could respond to their mate's desire for different foods.

WHICH BIRD DID THEY STUDY

The North Island robin, or toutouwai, was chosen to test the hypothesis. They are already known to actively share food with their mates during the breeding season and readily interact with humans and experimental apparatus.

WHAT WERE THE HYPOTHESES?

- *That female North Island robins will change their dietary preferences based on what they have already eaten.*
- *That female North Island robins can behaviourally communicate their specific food desires to their mates.*

HOW WAS THE STUDY DESIGNED?

Before you read on, design your own method to test their hypothesis.

The Specific Satiety Experiment
To test whether female robin dietary preference changes based on what they've already eaten, the researchers used two types of insect larvae as the food choices, wax-moth larvae and mealworms. At first, they established that a female robin's preference for one type of larvae would decrease if they had eaten it recently. This was done simply by pre-feeding the female with either wax-moth larvae or mealworms, and then presenting them with a choice between either.

The Food-Sharing Experiment
In the food-sharing experiment, they began by pre-feeding the female a small amount of either a wax-moth larvae or a meal worm. Immediately after pre-feeding the female, they gave the male six choices between wax-moth larvae or meal worms and allowed him to take one.

To test what kind of information the male was receiving, the researchers carried out the experiment with two different conditions. In one condition, the male could see the researchers feeding the female. In the other condition, they made sure he did not.

Finally, the researchers timed their experiments at the onset of the breeding season to establish whether the males food-sharing behaviour changed depending on the number of days before or after incubation had started.

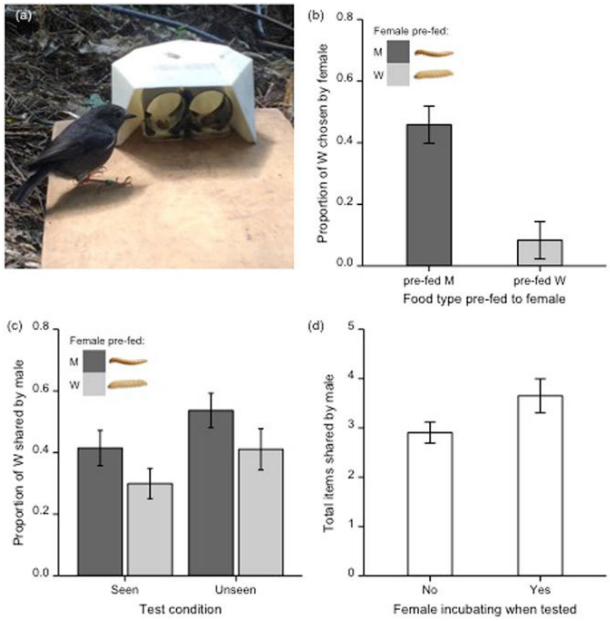
- *What do you think the variables chosen in these experiments were designed to test for?*

Examining the Results

Below is a picture of the feeding apparatus used for the specific satiety experiment and the graphed results of the two experiments.

WHAT DID THEY FIND?

1. The female robins preference for a type of larvae decreased if they had eaten it recently.
2. Male robins were able to choose the most desirable larvae for their mate, even if they hadn't seen her being fed.
3. Male robins shared more food with their mates when incubation had started.



- *How do you think the researchers came to the conclusion that the female robins were able to communicate what their food preference was to the male? Which particular lines of evidence did they use?*
- *What do you think are the benefits of this for the female? What would the value be in her having a varied diet?*
- *What do you think are the benefits of this for the male? Why is it important for him to be able to respond to her preferences?*

While the researchers were able to establish that some form of communication was taking place between the female and male, they were unable to identify exactly what behaviours were part of that communication.

- *How would you design an experiment to figure out how the female communicates what she wants to the male?*

Further Investigation

- *Birds have a far higher rate of shared parental care than mammals. Why do you think this is?*
- *Does food-sharing behaviour change depending on the species diet? Are herbivores different to carnivores?*

Photos by Tony Wills

CHECK OUT THE ARTICLE

Shaw RC, MacKinlay RD, Clayton NS, Burns KC (2017). Male New Zealand robins (Petroica longipes) cater to their mate's desire when sharing food in the wild. Scientific Reports 7, 896.