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**Contact: Victoria Picknell, 02074496361 or [victoria.picknell@zsl.org](mailto:victoria.picknell@zsl.org)**

High resolution images and advanced copies of the paper are available on request

## **Healthy Mum – Eggcellent chicks**

Maternal diet key to chick survival

Parents who eat their 5-a-day can help protect their chicks against parasites, reveals new research on the New Zealand hihi published today.

Scientists identified carotenoids in adult hihi diets as an important ingredient for counteracting the negative effects of the blood sucking mite *Ornithonyssus bursa* on their chicks.

Hihi mums with mite-infested nests were provided with a dietary supplement of carotenoids by the researchers. These mums then went on to raise broods that were as healthy as those from mums with mite-free nests.

Carotenoids give egg yolks their rich gold colour, so mums that lay golden eggs are giving their chicks the best chance of defending themselves against the mites.

“Carotenoids are naturally occurring biochemicals that perform important roles in animal health including enhancing the immune system and acting as strong antioxidants. Nestlings face a period of rapid and energetic growth where resources are ideally used to reach a point where they can fend for themselves. Carotenoids help support this rapid development and can also help when additional stressors such as parasites are experienced by developing young.” says Dr John Ewen, from the Zoological Society of London, lead author of the study.

He adds: “Our results add to extensive global research showing the beneficial roles carotenoids play in the health of both young and adult birds and other vertebrates.”

Fruit and vegetables are rich in carotenoids, so it’s important that hihi parents build nests in forests with high plant biodiversity, to ensure a healthy, balanced diet.

Once widespread across New Zealand’s North Island, the hihi is now endangered and confined to a single remnant population on the small offshore island of Little Barrier and a few additional populations recently established through reintroduction.

“Like many other island endemic bird species, the hihi has declined following European colonization due to the introduction of exotic mammalian predators and extensive loss of habitat as well as the possible spread of exotic diseases”, says Dr Phill Cassey, from the University of Birmingham’s Centre for Ornithology and co-author of the study.

This timely research highlights the need for conserving rich forest ecosystems, providing hihi with the food sources they need to lay 'golden' eggs.

The research paper, *Maternally invested carotenoids compensate costly ectoparasitism in the hihi*, is published online this week in the US journal Proceedings of the National Academy of Sciences (PNAS).

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### **Editorial Notes**

- The scientists studied 81 hihi clutches in the field. *O. bursa* mites were removed from 39 clutches. The remaining 42 clutches were provided with either carotenoid-enriched or sugar-only-water supplements.
- Hihi are sexually dimorphic and dichromatic medium sized forest dwelling passerines. Hihi feed on nectar, fruit and invertebrates, the proportions of which vary with availability and time of year. Although no longer considered honeyeaters, they do share a largely overlapping niche with New Zealand's two honeyeater species, the tui and bellbird (korimako). Hihi are a cavity nesting species with a clutch size of between 3 – 5 small white eggs. Cavities are usually located high up live mature trees of a variety of native species. They also readily use artificial nest boxes when mature trees with cavities are limited. Females take sole responsibility for incubation and do so for about 14 days before hatching. Nestlings are then cared for by both the female and male, although it's the female who does most of the work. For further information please visit <http://www.hihiconservation.com>
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