

Gathering information about food is not top priority for individuals with high metabolisms

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Credit: AI-generated image ([disclaimer](#))

(Phys.org) —New research has revealed that individuals with the highest metabolic rates within populations should be the least pre-occupied with keeping track of changes in their environments that could lead them to sources of food.

Individuals with slower or average metabolisms however should be constantly monitoring their opportunities for higher gain when they are looking for food.

The study shows that variation in metabolic rates between individuals can explain dramatic differences in information use when it comes to food.

The researchers, from the University of Exeter and the Max Plank Institute for Ornithology, developed a mathematical model to determine how [metabolic rate](#) - of the range present in many animals, including humans - influences the way in which individuals use information when foraging.

Commonly thought to be associated with weight gain, a low metabolic rate refers to the relatively small amount of energy required for an individual's major organs to function compared to an individual with a high metabolic rate.

The model assumed that if energy reserves drop to a critical level then the individual would die from starvation and it required individuals to accrue sufficient reserves to survive overnight.

The results can be used to predict how differences in metabolic rate dictate the way that individuals accumulate energy reserves. The results also show how differences in metabolic rate influence the way that individuals exploit resources that need to be tracked to be efficiently used.

Dr Sasha Dall from Biosciences at the University of Exeter said: "Our model shows that metabolic rate strongly influences an individual's willingness to use information while searching for food. There is a cost associated with gathering information and we have found that

individuals with high metabolic rates don't value this information enough to pay the costs of obtaining it - even if it makes them better at finding food. Individuals with lower metabolic rates however value information enough to use it extensively."

Dr Kimberley Mathot from the Max Plank Institute for Ornithology said: "This study suggests that it is not worthwhile for individuals with high metabolic rates, and so high energy requirements, to make the costly errors that would be inevitable if they were to try to learn about the best foraging options. Individuals with low metabolic rates, and lower overall energy requirements, have less to lose and so can explore multiple options that may result in them finding productive sources of food."

The research suggests that individuals with low or moderate metabolic rates, who regularly gather information on acquiring energy reserves, may be in a better position to exploit the best foraging opportunities when they arise compared to those individuals with high metabolic rates who have not invested in information. This makes individuals with low metabolic rates better at dealing with [food](#) shortages.

The study highlights how differences in energy use by the body can strongly influence individual behavioural tendencies and decision making. Future work will investigate whether variation in metabolic rates can be used to predict behavioural differences in other contexts.

More information: The research is published in the *American Naturalist* and is available online: www.jstor.org/stable/10.1086/673300

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