

Arctic wildlife uses extreme method to save energy

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The Svalbard rock ptarmigan. Credit: Andreas Nord

Researchers from Lund University and the University of Tromsø have

examined the immune system strength of the Svalbard rock ptarmigan in the Arctic. This bird lives the farthest up in the Arctic of any land bird, and the researchers have investigated how the immune response varies between winter and late spring.

"We have discovered that the birds reduce how much they spend on keeping their own immune defense system up and running during the five months of the year when it is dark around the clock, probably to save energy. Instead, they use those resources on keeping warm and looking for food. When daylight returns, their [immune response](#) is strengthened again," says Andreas Nord, researcher at Lund University.

The researchers found that when the birds become ill in mid-winter, their energy consumption drops compared to when they are healthy. However, when the [birds](#) become ill in late spring, their energy consumption increases instead.

"A weaker immune system is probably a part of all the adaptations that Arctic animals use to save energy in winter. The risk of being infected by various diseases so far north is less in winter than when it becomes warmer towards summer," says Andreas Nord.

When Svalbard rock ptarmigan save energy in this manner, they do so by weakening an already weak immune system. According to the researchers, this is probably due to the fact that the species evolved in the Arctic where there has been less of a need for a very strong immune defense system.

"This may have [negative consequences](#) when the climate changes and [migratory birds](#) arrive earlier in the Arctic and leave later. More and more tourists also come ashore in places where people have not set foot before. Such a scenario paves the way for an increased risk of disease and may be a threat to animals that have evolved in the Arctic where a

strong immune defense system might not have been needed," Andreas Nord concludes.

More information: Andreas Nord et al. Reduced immune responsiveness contributes to winter energy conservation in an Arctic bird, *The Journal of Experimental Biology* (2020). [DOI: 10.1242/jeb.219287](https://doi.org/10.1242/jeb.219287)

Provided by Lund University

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