

Salmon, blue mussel, eider, and eel die from the same vitamin deficiency

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Deficiency of vitamin B1 (thiamine) in wildlife is previously known as a problem among certain species within relatively limited geographical areas. Now, researchers at Stockholm University, together with several other research institutions in Europe and North America, show that the thiamine deficiency is far more widespread than previously realized. The results are published today in the highly ranked journal *Scientific Reports*.

By examination of thousands of mussels, birds, and fishes in 45 areas in the Northern Hemisphere, the researchers now demonstrate that the thiamine deficiency problem in wildlife is much more extensive than previously realized. Special attention is paid to the high prevalence of such effects that cause impaired health and reproduction, but are not directly fatal. This impact is very serious, because, in the long run, also these effects will cause populations to decline and disappear. Another important conclusion is that the thiamine deficiency occurs episodically, i.e. with variable intensity in time and space.

- The symptoms may appear for one or more years in an area, after which they can disappear for some time and then return, declares Professor Lennart Balk, who has coordinated the research.

The thiamine deficiency in the species investigated here - blue mussel, common eider, American and European eel, Atlantic salmon, and sea trout - has been demonstrated by chemical and biochemical analysis. Examples of effects that are not directly fatal, but that have been related

to thiamine deficiency, include reduced growth, altered organ sizes, generally impaired nutritional status, impaired blood chemistry, increased infections, altered behaviour, impaired swimming endurance, and substantial negative effects on reproduction. The link between such effects and thiamine deficiency has been demonstrated previously in laboratory experiments, but now also in wildlife in the field. Moreover, data in the existing literature have been revisited and, in the light of the new results, further indicate the occurrence of thiamine deficiency across the Pacific Ocean, North America, the Atlantic Ocean, and northern Europe.

The overall goal of the research is to find the ultimate cause of the thiamine deficiency, i.e. how it has arisen in the ecosystems. The presented results provide essential basic knowledge for the further investigation of possible biochemical mechanisms.

- Currently, we cannot exclude that the observed [thiamine deficiency](#) is so serious that it significantly contributes to the ongoing worldwide extinction of many animal species, says Lennart Balk. Other researchers have pinpointed this loss of biological diversity as the most serious of all threats to life on earth today.

More information: Lennart Balk et al, Widespread episodic thiamine deficiency in Northern Hemisphere wildlife, *Scientific Reports* (2016). [DOI: 10.1038/srep38821](https://doi.org/10.1038/srep38821)

Provided by Stockholm University

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