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**"End-to-end" amino acid transfer and net growth efficiency by compound-specific isotope analysis**

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Proteins and therefore amino acids are the bricks of life and an essential part of marine food webs. Amino acids connect primary- with secondary production, and essential lysine, arginine, and methionine are the first limiting amino acids in aquaculture fish. We don't know how often secondary and fish production is limited by amino acids in the field. GC-MS and GC-C-IRMS based amino acid analyses of phyto- and zooplankton from the Baltic Sea for the first time give amino acid-specific insights into quality- and quantity fluctuations at the dietary base for sprat, herring, and cod across large hydrochemical gradients in the field. Compound-specific isotope analyses including fish eggs hold the potential to identify and quantify the "end-to-end" transfer of amino acids and the nitrogen specific net growth efficiency across trophic levels in the sea.

Key words: Baltic Sea, hydrochemistry, compound specific isotope analysis, amino acids, zooplankton, phytoplankton, fish eggs