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POTENTIALS AND CHALLENGES OF BIOGAS FROM FISH INDUSTRY WASTE IN THE ARCTIC

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Abstract

The fish industry is a main industry in many Arctic locations. In most places by-products are disposed of at sea. Oxygen depletion and dead sea bottom is observed, as the organic material is biodegraded and methane produced; contributing to the global warming. In this study, the biogas potential of fish industry by-products from Greenland was investigated. Methane potential of Greenlandic shrimp, crab, and halibut by-products as well as co-digestion of shrimp by-products with waste water sludge and common brown algae was tested in lab scale batch experiments at mesophilic conditions. Fate of indicator microorganisms was investigated. All residues had biogas potentials similar to or higher than conventional feedstocks like manure and silage. Waste water sludge and brown algae had potentials comparable to manure. The combined shrimp and algae digestion showed indication of synergistic effects. Indicator bacteria were reduced significantly while coliphages (virus indicators) were not. Fish and seafood by products from the fish processing industry constitute a significant resource for energy and may provide an economic incentive to install digesters, which can also partly stabilize waste water sludge, though additional heat treatment may be necessary depending on final use of digestate.