

# The use of nitrogen compounds from organic waste

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## Abstract

Organic waste (e.g., food waste) contains nitrogen compounds, which were initially considered for human consumption. In recent years, microbial processes have been presented, which considered the use of organic nitrogen compounds, such as amino acids, as nitrogen sources for microbes. Microbes can synthesize and particularly microalgae can assimilate proteins in biomass. This contribution introduces to methods for nitrogen “recycling” from organic waste. The focus is on keeping functionalized nitrogen compounds in the food and feed chain.

Keywords: organic waste, microalgal proteins, nitrogen

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## 1. Organic waste contains nitrogen compounds

Organic waste contains substantial amounts of nitrogen in form of proteins and amino acids. For instance food waste contains up to 20% (w/w) proteins, which were originally considered for human consumption. At the same time, earth is facing a “lack-of-protein” problem.

Even though wasted food is no longer applicable as food source (Pleissner 2018), nitrogen compounds can be recovered and used for other purposes. One purpose is the application as nitrogen source for biological agents and in particular algae (Pleissner and Rumbold 2018).

## 2. Nitrogen compounds can be used to build-up proteins

Hydrolysis using proteases cleaves proteins in food waste and releases amino acids. Amino acids serve as nitrogen source for various microbes. Most microbes metabolize nitrogen compounds, but microalgae are known for the accumulation of high nutritional proteins. Thus, compounds from food waste cannot only be “recycled”, but “upcycled” to new nutritional compounds (Pleissner et al. 2017).

Upcycling of nitrogen compounds, however, is prevented by safety and hygiene issues. Intensive monitoring must be carried out to exclude that pathogens are transferred from waste to new nutritional compounds.

If safety and hygiene standards are fulfilled, the upcycling of nitrogen compounds can make alternative protein sources available and contribute to the solution of the “lack-of-protein” problem.

## References

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