# Exploitation of waste hydrolysate from poultry industry for growth of microorganisms with potential of carbonate precipitation

**Hana Stiborova[1], Kristyna Klikova[1], Katerina Demnerova[1]**

[1] *University of Chemistry and Technology, Prague, Faculty of Food and Biochemical Technology, Technicka 3, 166 28 Prague 6, Czech Republic*

Keywords: carbon footprint, waste, ureolytic activity, MICP

Presenting author email: hana.stiborova@vscht.cz

Carbon dioxide accumulates in the atmosphere, and its continuously increasing concentrations belong among the main causes of climate change (Intergovernmental Panel on Climate Change) (1). Currently, the cumulative carbon dioxide ($CO_2$) released into the atmosphere is estimated to be around 40 $GtCO_2$/year (IPCC Report 2018, https://www.ipcc.ch/sr15/). The possibility of reducing the carbon footprint is by recycling and reusing waste from different technologies.

The global annual production of solid waste is estimated at around 7-9 billion tonnes, which is increasing yearly. For example, in the EU, more than a third of all generated waste represents waste from construction and demolition. One of the possibilities to recycle wastes and thus reduce the carbon footprint and energy consumption is by the MICP (microbiological calcite precipitation) technology which uses microorganisms to form a composite sample, so-called bio-concreate (2). This technology has great potential in recycling solid waste from various industries (e.g. construction, mining, metallurgy, and manufacturing). Using MICP, the carbon footprint can be significantly reduced, as the concrete industry contributes up to 8 % of total anthropogenic $CO_2$ emissions.

So far, MICP applications are mainly available under laboratory conditions due to the relatively high costs associated with the usage of commercial nutrient media for bacteria growths. One way to reduce these costs is their replacement by various waste hydrolysates rich in peptides and nutrient content, e.g. from the poultry industry. The replacement of cultivation medium for bacterium *Sporosarcina pasteurii* DSM 33 with ureolytic activity by feather hydrolysate was exploited, and the formation of calcium carbonate crystals was tested.

Acknowledgement: The research was supported by projects of TACR TN02000044 and TN01000048.

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