

## Microalgae for Plant Biostimulants on Whey and Dairy Wastewaters

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**Abstract :** Whey and dairy wastewaters if disposed in the environment without proper treatment, cause serious environmental risks contributing to overall and particular environmental pollution and climate change. Biological treatment of wastewater is considered to be most eco-friendly approach, as compared to the chemical treatment methods. Research shows, that dairy wastewater can potentially be remediated by use of microalgae thus significantly reducing the content of carbohydrates, P, N, K and other pollutants. Moreover, it has been shown, that use of dairy wastewaters results in higher microalgae biomass production. In recent decades microalgal biomass has entailed a big interest for its potential applications in pharmaceuticals, biomedicine, health supplementation, cosmetics, animal feed, plant protection, bioremediation and biofuels. It was shown, that lipids productivity on whey and dairy wastewater is higher as compared with standard cultivation media and occurred without the necessity of inducing specific stress conditions such as N starvation. Moreover, microalgae biomass production as usually associated with high production costs may benefit from perspective of both reasons - enhanced microalgae biomass or target substances productivity on cheap growth substrate and effective management of whey and dairy wastewaters, which is significant for decrease of total production costs in both processes. Obviously, it became especially important when large volume and low cost industrial microalgal biomass production is anticipated for further use in agriculture of crops as plant growth stimulants, biopesticides soil fertilisers or remediating solutions. Environmental load of dairy wastewaters can be significantly decreased when microalgae are grown in coculture with other microorganisms. This enhances the utilisation of lactose, which is main C source in whey and dairy wastewaters when it is not metabolised easily by most microalgal species chosen. Our study shows that certain microalgae strains can be used in treatment of residual sugars containing industrial wastewaters and decrease of their concentration thus approving that further extensive research on dairy wastewaters pre-treatment options for effective cultivation of microalgae, carbon uptake and metabolism, strain selection and choice of coculture candidates is needed for further optimisation of the process.

**Keywords :** microalgae, whey, dairy wastewaters, sustainability, plant biostimulants

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