

Anaerobic co-digestion of agricultural by-products with manure, for enhanced biogas production - DTU Orbit (08/11/2017)

Anaerobic co-digestion of agricultural by-products with manure, for enhanced biogas production

Biogas is extensively promoted as a promising renewable energy. Therefore, the search of appropriate co-substrates has come into focus. In this study, we examined the potential of using agricultural byproducts as alternative co-substrates for increased biogas production. The biochemical methane potential (BMP) of six agricultural organic byproducts were tested. Consecutively, the byproduct with the highest BMP was used as a co-digestion substrate with manure, in a continuous stirred tank reactor (CSTR). Meadow grass had the highest BMP value [388 ± 30 NmL of CH₄ g⁻¹ of volatile solids (VS)] among all mono-substrates tested. On the basis of BMP, the substrates ranked as follows: meadow grass > spring barley, winter wheat, winter barley, ryegrass > rapeseed > manure. Co-digestion of manure with byproducts resulted in only an additive and not synergistic methane production. Continuous co-digestion of 34 g L⁻¹ raw meadow grass with manure increased the methane production rate of the CSTR reactor by 114% compared to the manure alone.

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