## P414. Biogas production through co-digestion of enzymatically pretreated corn bran and cow manure

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Biogas production from wastes is an alternative that contributes positively to the environment and minimize the dependence on fossil energy sources. Additionally, the reuse of biomasses helps to reduce the waste production, but a pretreatment is required to use it in the anaerobic digestion. Here biogas was produced through co-digestion of enzymatically pretreated corn bran and cow manure. Firstly, it was selected the most hydrolysable waste (barley bagasse, sugar cane bagasse, elephant grass, thick orange pie, average orange pie, wheat bran, coffee grounds, orange peel, white sludge, vinasse, corn bran, soy bran, soy peel, cotton bran, cassava husk, cassava flour, banana peel, corn bran, sorghum stem, sorghum seed, total sorghum and wet distiller grain) by the crude extracts containing amylase (secreted by *Aspergillus brasiliensis*), xylanase (*Aspergillus tamarii* Kita) and cellulase (*Trichoderma reesei*, Novozymes®). Later on, different mixtures of these enzymes were studied using simplex-centroid designs. The most hydrolyzed waste by each enzyme individually (measured by reducing sugar using dinitrosalicylic acid, DNS) at 50°C, 120 rpm and 24 h were corn bran, banana peel and sorghum seed. Then, the simplex-centroid designs resulted in model equations and respective response surface contours. Amylase extract had a significant positive influence on corn bran hydrolysis by maximizing the reducing sugar yield when it was used individually (35g/L of reducing sugar). After it, the pretreated corn bran and a cow manure (1:2 g of volatile solids) were employed for biogas production in batch assays. It was found a biogas accumulation of 326 mL in the 12nd day of anaerobic co-digestion, which were similar to the control (containing 35 g/L of glucose alone) and 53% higher than that found with corn bran without enzymatic pretreatment. In conclusion, it was observed that the crude extract optimized for amylase production affected significantly the corn bran hydrolyses and consequently the biogas production in a co-digestion with cow manure.

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