Bio-refinery study in the crude jatropha oil process: Co-digestion sludge of crude jatropha oil and capsule husk jatropha curcas linn as biogas feedstocks

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Abstrak

One of the cultivation failure reasons of Jatropha curcas Linn (JcL) in Indonesia was that it was only recommended for Crude Jatropha Oil (CJO) production which is processed into biodiesel. CJO is only 17-25% of dry seed weight, while the waste residue is called seed cake. Another waste product is dried capsule husk (DH-JcL) which is about 30-80% of the fresh fruit weight and sludge CJO (S-CJO) or about 2-5% of the CJO. S-CJO was unutilized which is bad for the ecology when it is disposed. The research objective was the utilization of the S-CJO waste for bio-refinery and improvement productivity of biogas made from DH-JcL.The study was conducted at the research garden of PT Bumimas Ekapersada, Bekasi, West Java in November-December 2012. A liter one-stage digester was compiled completely as a randomized design (CRD) with three replications in a water bath at a temperature of 32o C. The materials used were DH-JcL of JatroMas cultivars in the toxic category which were mixed with the sludge S-CJO as a co-substrate about with 10% water at a ratio of 1:8. Observation variables were biogas production volume (water displacement method), pH and temperature in the outlet slurry. The preliminary study concludes that S-CJO is appropriate as the co-substrate DH-JcL. It can increase the biogas productivity with feed in less than 10% of S-CJO allocation per day