

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