Methane Fermentation from Waste Glycerol and Sludge -Approach on Miyagi Prefecture 3 R New Technical Research Development Project- (Advanced Studies on Sustainable Animal Production: Interrelationships among Human, Animal and Environment, 8th International Symposium of Integrated Field Science)

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Glycerol of biodiesel manufacture process and wastewater sludge of food factory were digested by methane fermentation. This project is supported by 3R project of Miyagi Prefecture. The glycerol and the wastewater sludge were produced in Osaki city, north part of Miyagi prefecture. Until now, these wastes have burned or composted as waste treatments. In the present study, the energy recovery from methane fermentation of the glycerol and the wastewater sludge was estimated. The digested sludge from the methane fermentation was assumed as liquid manure. The best fermentation condition was addition of 0.5%/day glycerol to the volume of sludge containing seed sludge and the wastewater sludge (5% of dry weight) in the proportion of one part to three. Production of methane was 48.4 ml per 40 ml of the mixture. The digested sludge derived from the methane fermentation includes 98% of the nitrogen, 5% of the phosphorus and 2% of the potassium required to grow rapeseed in 1ha. Provisional calculation of EPR (Energy Profit Ratio) were 0.25. However, the social system introduced the methane fermentation would get higher energy production than that without the methane fermentation. Therefore, methane fermentation will become a help of the creation of a recycling society. The pretreatment method of the sludge is examined for the improvement of the methane yield now.