The study on the using of Foodwaste processor for production of Methane gas and to reduction of organic matters

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1. Introduction
As of 2008, unit generation of food waste in Korea is 1,116ton/day. Approximately, 53% of the food waste is generated in houses and 47% in restaurants and other dining places. It means most of food waste come from restaurants and houses. But food waste had been increased since they are prohibited to go to landfill (January 1, 2005). That is why government and companies of Korea went through numerous researches in order to decrease the level of environmental pollution and economic damages. This study suggests that food waste which from household and restaurants will be pulverized by disposer and also it does its’ purpose to decrease organic matters and produce methane gas by using EM(Effective Microorganisms).

2. Research contents and Methodology
In this study, two separate disposers were installed in restaurant and house and [figure 1] shows the food waste decomposition treatment reactor. [Figure 2] shows a ceramic bowl and media in reactor used in this experiment.

[Fig.1 The food waste decomposition treatment reactor]
[Fig.2 The ceramic bowl and media in reactor]

These reactors inject EM into them, so 500g of dried EM, 5kg of sugar and 20L water get mixed on the sponge after that the sponge is incubated for a day. The sponge which is incubated are injected into each reactors. In case of the food waste decomposition treatment reactor are mixture of 2L sponge and 0.5L sponge. In case of restaurant, 500g of food waste with 10L water, in case of house, 150g of food waste with 3L water were put into the disposer and conducted in experiments. Food waste come from restaurant are pulverizated 2 to 3 times and mixed with 500g of food waste with 10L water. In case of food waste in Household were mixed 150g of food waste with 3L water without any pulverizating. By using this method, food waste can be pulverizated and successfully combined with EM (Effective Micro organism). 50ml of sampling was in restaurant and 30ml of sampling were captured in household. Time gaps were given as 1hr, 3hrs, 5hrs, 8hrs and 11hrs.

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[Figure 3] shows the concentration changes of experiment items.

Fig.4 The concentration changes of experiment items

While the food waste is being treated by EM, some methane gas are exhausted into the processor. Studies are still in process to collect the methane gas from the processor and use of the methane gas. If methane gas are collected from the processor, we will be able to use major heating and electricity for free which come from processors in our houses.

3. Conclusions.

1) In case of BOD, it shows 27% treatment efficiency from restaurant and 29% treatment efficiency from household. In general, the whole treatment efficiency of organic matter sum up to 20~30%, the efficiency of household is better than that of restaurant.

2) The efficiency of T-N, T-P in household is 50% and 38% each, higher than the efficiency of T-N, T-P in restaurant.

3) It is known Wastewater takes 1 day~2 days to get to wastewater treatment area from houses. If this treated water are discharged into sewage, the concentration of food waste water which is treated by food waste processor will be decreased by Effective Micro organism.

4) If we can collect methane gas from the disposer, free heating and electricity at home will be available.

4. References.


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