CHAPTER 7

Conclusion

The microbial community structure in anaerobic co-digestion of 70% pig manure with 30% Napier grass and 60% pig manure with 40% food waste based on volatile solid (VS) under different hydraulic retention time (HRT) of 10, 20 and 30 days in channel digester-upflow anaerobic sludge blanket (CD-UASB) and completely stirred tank reactor (CSTR) were investigate in this study

The following conclusions could be drawn from the study:

1. The bacterial population was clearly changed during reactor operation of process while archaeal population was stable.
2. The bacterial change pattern in reactor seemed to relate with the methane production.
3. The reactor design, substrate type and HRT affected the bacterial population structure but have little effect on the archaeal population.
4. Bacteria in the phyla *Proteobacteria*, *Firmicutes*, *Bacteroidetes*, *Chloroflexi*, *Cloacamonas* and *Spirochaete* were found in the reactor co-digested with Napier grass. Phylum *Firmicutes* was dominant bacterial group.
5. Bacteria in the phyla *Proteobacteria*, *Firmicutes*, *Bacteroidetes*, *Chloroflexi*, *Cloacamonas*, *Flavobacteria* and *Acidobacteria* were found in the reactor co-digested with food waste. Member of phyla *Firmicutes* and *Bacteroidetes* were dominant bacterial group.
6. For methanogens, hydrogenotrophic *Methanomicrobiales* and acetoclastic *Methanosarcinales* were dominated in all reactor.