VII CONCLUSIONS

From the experimental results, the following conclusions can be drawn.

1) Both AnFB and RAUS were able to pretreated slaughterhouse wastewater. The removal efficiency of filter COD was similar to total COD for fixed-bed, however, the removal efficiency of filter COD was slightly less than total COD for RAUS.

2) The COD removal efficiency provided by both AnFB and RAUS inversely related to the increasing of hydraulic loading rate.

3) High COD removal of 65%, with 72% SS removal efficiency, could be achieved when operated at an organic loading of 0.94 kg COD/(m^3.d) of the reactor void volume (HRT 11 h.) for fixed-bed reactor. In the same way, high COD removal of 70% with 66% SS removal efficiency could be achieved for RAUS at an organic loading of 0.36 kg/(m^3.d) or 21 h. HRT.

4) The RAUS could operate at optimum hydraulic retention times of 9 h., whereas the optimum for AnFB was 6 h. The AnFB could achieve an organic loading rate greater than 1 kg COD/(m^3.d) while RAUS could achieve 0.93 kg/(m^3.d). At the optimum space loading both reactors were able to achieve efficiency greater than 50%, with a better quality of average filter effluent COD less than 100 mg/l.

5) At the same hydraulic retention time, fixed-bed was more practical than RAUS in COD removal efficiency while RAUS had an advantage on suspended solids removal over fixed-bed reactor.

6) Failure of fixed-bed reactor was due to biomass washout whereas for RAUS no COD removal efficiency was the reason.

7) AnFB and RAUS could be operated for long period of time without becoming filled with biological solids and without wasting excess solids. This occured because of low synthesis of microorganisms during anaerobic conversion of organic wastes to methane gas and because of the long solids retention time within the reactor.

8) Ambient temperature of 29-32°C and slaughterhouse wastewater pH of 7-8 were suitable for treatment by anaerobic process.

9) VFA was extremely low for anaerobic treatment with slaughterhouse wastewater without any chemicals adjustment.

10) Methane gas as a by-product for low concentration slaughterhouse is not recommended.

11) Hybrid reactor which combines the advantages of both AnFB and RAUS concepts is recommended for higher treatment efficiency as well as being more economical.