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| Thesis title | Energy Analysis in Food Industrial Plant via Exergy |
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ABSTRACT

This research was carried on the exergy analysis of the fish snack process and the bean snack process. From the analysis, the fish snack process had two subprocesses. Subprocess 1 of fish snack process had the overall efficiency 25.41 % and its effectiveness 4.74 % . In this subprocess, there were the preheating unit and the drying unit . Their efficiencies were 27.26 % and 38.21 % and their effectivenesses are 4.93 % and 8.95 %, respectively. Subprocess 2 of fish snack process was only composed of roasting unit. It had efficiency 51.12 % and effectiveness 16.70 %.

For the bean snack process, two additional processes were subprocess 1 and subprocess 2 . Subprocess 1 of bean snack process was composed of frying unit, heat exchanger unit and boiler unit. Their efficiencies were 99.09% , 25.57% and 75.94% and their effectivenesses were 94.50% , 25.46% and 25.56% , respectively. The overall efficiency of this subprocess was 7.79% and effectiveness 3.02%. For subprocess 2 of bean snack process , parching unit only , it had efficiency 21.25 % and effectiveness 5.09 %.

For the improvement of the process at preheating unit , the zinc plate was proposed to install as a heat loss protection. The plate could save LPG about 864 kg per year. By recovering heat form hot air of the roasting unit could save LPG about 1,440 kg per year. For bean snack process, by installing fiber glass 3 inch thickness insulation , the energy could be saved to 99.94%. To modify the bean snack process, the factory had been installed the steaming unit before entering the frying unit. The efficiency was not much improved but the quality of products were better.