

Chapter VII

CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

As shown from the experiment, Parboiling Technique could be used for pretreatment of paddy before milling, to improve its quality. This technique can be applied to low quality paddy, to obtain high quality rice. Therefore, it can be sold at a high price since % broken rice is reduced and the weight of rice has been increased (because some portions of bran diffuses into rice grain). Furthermore, production cost of parboiled rice is lower than white rice (44). Now a day, parboiled rice is for exported only; but has not been consumed within the country because of its strong smell. However, this problem can be solved by improving the soaking technique. Therefore, it is worth in encouraging people to turn to parboiled rice instead of consuming white rice, since parboiled rice is more nutritive and also helps increasing the farmers' income.

For Fluidized-Bed Technique which had been applied in drying parboiled paddy, it was found from the experiment that it exhibited good results, since it gave high thermal efficiency, high rate of moisture removed, short drying time (owing to the high rates of heat and mass transfer), simple design and relatively small size which make the capital cost lower than other types of drying.

By experiment, it is concluded that continuous operation type should be applied to dry parboiled paddy since it was easy to operate and gave higher thermal efficiency than batch type. For optimum conditions, 183°C temperature of air inlet was used because it was the best lowest temperature suitable for continuous system which only 2 drying passes were required. The air inlet flow rate at $1.579 \times 10^{-2} \text{ m}^3/\text{sec}$ (at S.T.P.) was selected. From the experiment, it was shown that the change in flow rate of air inlet had no effect on the rate of moisture removal. However, the flow rate selected was not the lowest one because we would like to obtain high production rate, and consequently, the mean of all the flow rates used in the experiment was selected. The production rate selected was $8.7753 \times 10^{-3} \text{ kg/sec}$, which was the maximum value among the feed rates used in the experiment to maximize the production rate. The lower feed rates were also considered, but they did not have much effect on final moisture content.

7.2 Recommendations

Recommendations for further study are given as follows:

- 1) To improve the fastness of operation; the two-stage or multistage operation is worth studying so that paddy passing the first stage of drying can be continuously transferred for tempering at the second stage, and returned to the first stage again for final drying. This operation is faster than bringing paddy

from the column to be cooled on the large plate. The proposed system might be done by recycling air outlet from the first stage (which has been passing through a cooler system) to cool paddy during the tempering in the second stage, then passing through a heater and returning to dry in the first stage again.

2) Mass transfer determination of present work and further research should be studied.

3) Since the nutrition values of parboiled rice may be affected by heating, the nutrition tests before and after dryings are necessary.

4) Soaking step should be improved, to produce parboiled rice which approaches rice usually consumed within the country and the tests should be conducted to find out the acceptability among consumer, to encourage the consumers to turn to parboiled rice.