CHAPTER 1

INTRODUCTION

Rice bran is a major by-product of the rice industry. At present, fresh rice bran is used as a raw material in the edible oil and feed stuff industry. The deterioration of rice bran during storage is the important reason for which such rice bran used must be fresh. Its deterioration is caused principally by lypolytic hydrolysis of the oil in the rice bran.[1] When rice bran is used as raw material unususlly high refining losses occur, the reason for such losses is not completely understood.[2] For example, an oil containing 5% free fatty acid may have a refining loss of over 40%.[3] Losses from very low-acid rice brans are relatively small.

There are many processes used for stabilization of rice bran such as;

a) Chemical processes
b) Gamma radiation exposure process
c) Inert atmosphere exposure process
d) Dry heat processes
e) Moist heat processes

Chemical substances such as; heavy metal(Zn^{++},Cu^{++}), EDTA, CN^- and F^- as alcohol and acetone can inactivate the lipase enzyme,[4] but the disadvantages of this process are the toxicity caused by the residual chemicals. Storage of rice bran under inert gas(N_2,CO_2) or in vacuum is also ineffective in preventing deterioration.[5] Gamma irradiation can inactivate the lipase enzyme in rice bran, but the process is not sound economically and there is also the problem of attaching the process at the mill site.[6]

Numerous authors have shown that heating or steaming the rice bran can inactivate the lipase enzyme.[7,8,9,10,11]

As mentioned previously, heat is a suitable means in

inactivating enzyme lipases. Additional advantage of heat treatment are that it can simultaneously kill microorganism and insects that can produce the lipases which increase the free fatty acid content of rice bran,[12] while also producing the dangerous mycotoxins.

Heat treatment also causes agglomeration of the rice bran into coarser size particles during solvent extraction of oil.[13,14,15]

Efficiency in stabilization of rice bran depends on treating conditions(temperature,time) and quality of final product(moisture, oil content etc.). So as to study the effects of treating condition on stabilization of rice bran, the efficiency of equipment must be high. From this work, fluidization columns seem to be the most appropriate equipment.

1.1 THE SCOPE OF THIS WORK

a) To study techniques of fluidization in stabilization of rice bran

b) To study the effects of treating conditions in stabilization of rice bran.

1.2 PROCEDURES OF THIS WORK

a) Treat the rice bran at various temperatures and times by keeping constant fluidizing velocities of hot air in the column

b) Store the treated rice bran in two different types of container and check the formation of free fatty acid to compare with the untreated rice bran versus time

c) To study the formation kinetic of free fatty acid in each sample of the rice bran and select the best result.