Thesis Title	Studies of the Physical Properties and Utilizations of Rice Starch and Modified Rice Starch
Name	Chanida Hansawasdi
Degree	Master of Science (Biotechnology)
Thesis Supervisory Committee	
	Saiyavit Varavinit, Dr.Ing.
	Manop Suphantharika, Ph.D.
	Pairoj Luangpituksa, D.Agr.Sc.
Date of Graduation	12 May B.E.2540 (1997)

ABSTRACT

After rice starch had passed through a cross linking reaction with sodium trimetaphosphate, the resulted cross linked rice starch possessed the dietary fiber properties. The value of total dietary fiber (%TDF) was determined by AOAC method. The three enzymes employed for this determination were α-amylase, glucoamylase and protease. It was found that these enzymes could hardly digest these inhibited swelling starch. Starches obtained from three varieties of rice had been studied. The three varieties were normal rice starch (26.56% amylose), Jasmine rice starch (18.15% amylose) and glutinous rice starch (5.53% amylose). The higher the drastic conditions, i.e., high quantity of sodium trimetaphosphate

and or high temperature and longer reaction time, the higher in the percentage of dietary fiber content would be obtained. Investigation of the characteristics properties and thermal behavior of these cross linked starches and their dietary fiber contents had been carried out. It was found that when the dietary fiber content increased the melt temperature (Tm) of the modified rice starches would also be increased.

On the other hand, when rice starch was irradiated by gamma-ray, at least two reactions were occurred, i.e., degradation of starch molecule and cross linking reaction. It was found that the peak viscosity of the gamma-ray irradiated rice starch was decreased significantly. While the Tm and Tg (glass transition temperature) of the irradiated rice starch were higher than those of the non-irradiated rice starch. This gamma-ray irradiated rice starch also provided lower swelling power at 95°C, this was also indicated the property of cross linked starch. Moreover, it was found that the gamma-ray irradiated rice starch possessed higher water solubility than the non-irradiated starch, since the starch molecule was degraded into smaller molecules with higher water solubility. At the same time, the reducing sugar content in gamma-ray irradiated rice starch was higher than that of non irradiated rice starch. This would emphasize the degradation of starch by gamma-ray irradiation.