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THEERANAN PRAKONGPAN : THE EXTRACTION AND  
APPLICATION OF DIETARY FIBER AND CELLULOSE FROM PINEAPPLE  
CORES. THESIS ADVISORS : ANADI NITITHAMYONG, Ph.D., PAIROJ  
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Dietary fiber and cellulose, which is also one of dietary fiber's components, are used in various food products for functional purposes. Industrial sources of dietary fiber are wood, cotton, and many kinds of fruits and vegetable by-products from food processing industries. Pineapple cores, a waste from the pineapple canning industry, have a potential of being a source of dietary fiber and cellulose. Pineapple cores are high fiber parts of the fruit composed mainly of insoluble fiber. Therefore, the aim of this study was to explore extraction methods and to determine the properties and functions of dietary fiber and cellulose extracted from pineapple cores in food products compared to those of commercial powdered cellulose. The dietary fiber (PDF) was obtained by alcoholic extraction of pineapple cores and the cellulose (PC) was a product of alkali extraction with bleaching process. The dietary fiber and cellulose from pineapple cores were analyzed for their total dietary fiber (TDF) and cellulose content. It was found that TDF content of dietary fiber and cellulose were 99.8 and 95.2 % (dry basis), respectively. The water activity was about 0.25 for both types of fibers. The cellulose from pineapple cores contained 91.2 % of cellulose while its pH (4.0) was lower than that of the dietary fiber (6.2). Large size particles PDF and PC had higher values than the smaller particles in pH, water retention capacity, oil retention capacity, settling volume and emulsifying activity. The microscopic and SEM photographs showed that the shapes of fibers from pineapple cores were various and different from those of commercial powdered cellulose in which were observed to have long, smooth, rod shape particles. PDF, PC, and commercial cellulose were incorporated into food products and their properties evaluated. Addition of large size fibers into cake-type doughnut resulted in increasing the moisture of doughnut after frying (10.7 to 21.7 % higher than control formula), and reducing the oil-uptake ( $U_R$ ) between frying (7.9 to 28.8 % less than control formula). Incorporation of 4 % of large fibers from pineapple cores in golden layer cake yielded greater volume; the cellulose fibers were the most effective in cakes. In the beef burger products, the weight yield after cooking of beef burger with 2 % of small size fibers added increased between 3.3 to 10.6 % and the burger with dietary fiber from pineapple cores gave the highest yield after cooking.