Indonesian Journal of Agricultural Science 7(1), 2006: 8-14

EFFECT OF HEAT MOISTURE TREATMENT OF SAGO STARCH ON ITS NOODLE QUALITY

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ABSTRACT

Sago starch has potential as source of flour for noodle. However, noodle made of sago starch has only been limitedly utilized due to the absence of gluten and lack of desired functional properties. Heat moisture treatment (HMT) is a promising technique for improving quality of sago noodle. The objectives of the present work were to study the effect of HMT of sago starch on its noodle quality. Four different origins of sago starch, i.e. Tuni, Ihur, Molat, and Pancasan, were treated with HMT method. HMT was performed by exposing the starch to high temperature (110°C for 16 hours) at moisture content of 25%. Sago starch was then processed into noodle. It was prepared by mixing the sago starch with binder (completely gelatinized starch and additive) into dough. The dough was pressed manually through a container with holes in the base. Noodles strains were steamed for 2 minutes and dried at 50°C in a convection drier. As the control, non-HMT sago starch was used and evaluated. Parameters evaluated were starch properties, physical strength, and cooking and sensory quality of the noodles. Analyses of variance was subjected to all parameters. Research results showed that the starch exposed to HMT changed its pasting profile from initial type A before treated to type B after treated. The noodle quality was also improved. Noodles resulted from starch treated with HMT showed higher firmness and elasticity, but they have lower stickiness compared to those of non-HMT. Less cooking loss and rehydration weight were also found, however, HMT increased cooking time of the noodles. HMT on Pancasan sago starch resulted in noodles which were preferred most by panelists. However, consumer testing is recommended to further validate consumers' preferences to the sago starch noodles. The study indicated that sago starch could be potentially used as raw material for noodle to increase the consumption of sago-based food.

[*Keywords: Sago starch, noodle, heat moisture treatment*]

INTRODUCTION

Sago palm (*Metroxylon* sp.) is one of the important sources of starch. The plants are mostly found in Papua New Guinea (Sepik and Gulf Province), Indonesia (Papua, Maluku, Sulawesi, Riau Island, and Mentawai Island), Malaysia (Sabah, Serawak and West Malaysia), Thailand (South Thailand), and the Philippines (Mindanao). The world estimated area of sago palm was 2.25 million ha of wild stands and 0.2 million ha of semicultivated (Flach 1997). Indonesia has the largest sago palm area followed by Papua New Guinea, Malaysia, and the Philippines. Sago produces higher starch compared to other crops; it yields around 2-3 tons starch per ha per year, compared to cassava which is 2 tons and maize 1 ton (Stantan 1992).

Sago starch has been the staple food for many people in eastern areas of Indonesia, especially Papua. They have various traditional food such as *papeda* (sago pudding), *colo-colo* (a hot sour soup and tuna fish), and *sagu ega* (sago paste wrapped with sago leaves). In recent years, sago consumption in Papua decreased; in 1994 sago consumption was 126 kg per capita, but in 1997 it was only 95.53 kg per capita (Hutapea *et al.* 2003). This may be due to the psychological barrier associated with sago as poor and primitive food.

One prospective use of sago is noodle, a popular product for Indonesian people. Currently, most noodles are made from imported wheat flour. In 2002, Indonesia imported wheat flour about 400,000 tons (Departemen Perindustrian dan Perdagangan 2003); 29.7% of it was processed to noodles (wet noodles and instant noodles). Interestingly, noodles made of sago starch are commercially found in West Java, especially in Bogor, Sukabumi, and Cianjur. Starch noodles are obviously different from other types of noodles, such as pasta and wheat flour, since it is made from gluten-free starch. Thus, starch itself plays an essential role in both starch noodle processing and the final starch noodle quality. Excellent starch noodles would have clear or transparent and fine threads, high tensile strength, and low cooking loss even with prolonged cooking (Collado *et al.* 2001).

Studies on the use of different starch for noodles conducted by Lii and Chang (1981) and Galvez *et al.*