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Procedia Food Science 3 (2015) 289 – 302

Procedia Food Science

The First International Symposium on Food and Agro-biodiversity (ISFA2014)

Characteristics of Noodle Prepared from Orange-fleshed Sweet Potato and Domestic Wheat Flour

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ABSTRACT

Noodle characteristics prepared from both 100% of domestic and imported wheat flour (as a control) and blended with 40% of orange-fleshed sweet potato paste were studied. The domestic wheat flour had higher protein content (13.8%), compare to imported wheat flour (11.7%), thus giving the highest protein content (18.86%) in noodle prepared from 100% domestic wheat flour. However its noodle colour was disliked due to a lower whiteness level compared to imported wheat flour. Blended 60% of domestic wheat flour with 40% of sweet potato paste could improve the noodle colour acceptance. The noodles prepared from both 100% wheat flours and blended with 40% sweet potato paste had met the national standard quality for moisture and protein content. This suggests that sweet potato paste is promising for noodle ingredients as a wheat flour substitute.

Peer-review under responsibility of the organizing committee of Indonesian Food Technologist Community

Key words: noodles, orange-fleshed sweet potato, wheat flour.

INTRODUCTION

Noodle is one of Indonesian favourite foods due to its acceptable taste to almost age groups, available at affordable prices and can be produced either by small, medium or large scale industries. The main ingredient of noodle is wheat flour. The dry, wet and instant

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Peer-review under responsibility of the organizing committee of Indonesian Food Technologist Community
doi:10.1016/j.profoo.2015.01.032

noodles constitute the largest portion of wheat flour use (55%), while the rest of 20% is used as ingredient for cake and breads, snacks and biscuits (15%), household (5%) and fried (5%) foods [1]. Increasing use of wheat flour is a result of diet transformation from traditional foods to western foods [2], thus leading to increasing import of this flour.

Indonesia considerably imported large amounts of wheat grains that were about 5.85 million tons in 2010, equivalent to 4.3 million tonnes of wheat flour [3]. In fact, wheat is a sub-tropical crop, thus self-sufficiency of wheat flour would not be possible for Indonesia as a tropical country. However, efforts for wheat cultivation and domestication have been conducted in selected high land areas, such as in Pangalengan (West Java), Dieng, Salatiga (Central Java) and Tosari (East Java) with planting area about 100 ha [4]. In order to meet domestic needs as well as to reduce import of wheat flour, wheat cultivation in larger areas would be further developed.

Selected wheat varieties from India were grown in Indonesia for adaptation trials as well as for breeding purposes. As a result, some domestic wheat varieties have been released which are favourable for tropical conditions [5]. Nias variety which was derived from DWR 162 showed higher yield when cultivated in Tosari, Pasuruan, East Java (3.5 t/ha) than in India (2.5 t/ha) [6]. Therefore, the utilization of domestic wheat flour needs to be promoted and developed along with the development of wheat cultivation in Indonesia. In this study, wheat flour derived from Dewata variety would be used as the ingredient for noodle preparation. Dewata was a domestication variety of DWR 162, which has been released in 2003 with a potential yield of 2.96 t/ha [7].

Diversification of sweet potato utilization into a variety of food products would support the national food security. In particular, the use of orange-fleshed sweet potato gives health benefits with respect to its beta carotene content, which has high pro-vitamin A and anti oxidative activities [8, 9, 10, 11]. In addition, the presence of phenolic compounds that also have function as antioxidants, dietary fiber and relatively low glycemic index (GI) of its carbohydrate, also contribute to functional food properties of sweet potato [10, 12].

Two orange-fleshed sweet potato varieties, namely Beta 1 and Beta 2 had been released in 2009 by Indonesian Ministry of Agriculture with considerably high beta carotene content (12,031 μg and 4,629 μg/100 g fresh weight, respectively) [13]. These figures are higher than beta carotene content in yellow squash (1,500 μg/100 g) and carrots (7,000-12,000 μg/100 g) [14]. However, orange-fleshed sweet potatoes mostly have high moisture [15] that would cause moist and tender texture of the steamed tubers [14, 16], suggesting that this cultivar is