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The Effect of Maltodextrin Concentration and Drying Temperature to Antioxidant Content of Sinom Beverage Powder

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Abstract

This paper seeks to provide a framework for determining the effect of malt dextrin concentration and drying temperature to antioxidant content of Sinom beverage powder and to determine the effect malt dextrin concentration and drying temperature to the production of Sinom beverage powder which containing best antioxidant content. This study use the split plot design with the factorial consist of two factors. The first is the concentration of malt dextrin in three levels of percentage, they are 15%, 20 % and 25 %. The second is drying temperature factor. There are also 3 levels drying temperature, 45°C, 50°C and 55°C. There are two groups obtaining 18 experimental units. The research parameters are the ability to capture free radicals of DPPH and the measurement of total phenol. The result showed that malt dextrin concentration and drying temperature affect the ability to capture free radicals DPPH and total phenol. The highest percentage of capturing ability of free radicals DPPH is 45.05 % and 85.45 (mg GAE/ 100g) total phenol.

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1. Introduction

Sinom beverage is made from turmeric and tamarind. Turmeric consist curcuminoid compound and volatile oil (atsiri) essentials. Curcuminoid consist of curcumin compound which has biological activity with wide spectrum,

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antibacterial, antioxidant and anti-hepatotoxic. Curcumin has several roles, as antioxidant, antitumor, anticancer and anti-microbe (Anonymous, 2013). The tamarind leaf (*Tamarindus indica* L.) rich in flavonoid, phenol, pectin and saponin (Mursito, 2004). According to Mulyani *et al* (2006), sinom beverage consists of bioactive components, that is flavonoid antioxidant that is able to obstruct fat oxidation.

Sinom beverage in liquid type is not durable because it is non-perishable. The damage is usually influenced by lightning, sun light, storage temperature, pH and presence of oxidation resulting in short storage period (Iswari, 2007). One way to make longer storage period of this beverage is to convert the shape into dry powder using a baked drying method. According to Octaviany, (2002), the process of making instant beverage consists of two phases commonly: extraction process and drying or evaporation process. The extraction process is the beginning process to gain the extract of active essence, then continued by drying phase as further process to lose the water content.

The product quality much depends on drying phase (Mahapatra *et al*, 2009). Drying process using oven tools is profitable due to the high loss of water in short time (Muller *et al*, 2006). However, overheats during the process may cause the damage on the thermolabile substance then decrease the product quality. To minimize the damage by drying process, then the materials used for coating the flavor component added. The other threat is making the drying process faster and prevent the damage caused by heat (Masters, 1979). Malt dextrin is substances often used in making dried food and drinks. As the filling substance, malt dextrin also has several good sides, like not sweet and soluble in water (Kuntz, 1998). As the research by (Wiyono, 2012) shows that the threat of malt dextrin concentration 20 % with the temperature 50°C is the best threat in making temulawak (ginger) powder. Based on that research, then the research conducted to know the effect of malt dextrin concentration and the drying temperature to the characteristic of sinom beverage powder and to determine appropriate malt dextrin concentration and drying temperature to produce the best quality of sinom beverage with high antioxidant content. The advantage of this research is making the sinom beverage more efficient and easy to make.

2. Research Method

2.1 Place and Time of Research

This research held in laboratory analysis of food sciences and food technology, biochemistry and nutrition Department of Engineering laboratories and quality control process, agricultural industrial technology Department, Udayana University. The research held from March until July 2014.

2.2 Equipment

The main equipment used in the research are spectrophotometer, oven, analytic scales, vortex, and homogenizer.

2.3 Material

The materials used in the research are turmeric from Sulangai village, Badung regency, Bali, tamarind leaves from Banjar Jukut Paku, Singakerta village, Ubud- Gianyar regency, maltodextrin DE 10- 15 , DPPH (2,2-dhipenil-1-picryldhydrazyl) , gallic acid, *Folin-ciocalteu Phenol*, *emulsifier* Tween 80.

2.4 Experimental Design

This research use split plot design with two factors. Firstly is the concentration of malt dextrin consist of 3 extents, 15%, 20% and 25%. Second factor is drying temperature, consisting 3 extents, 45°C, 50°C and 55°C. The process performed twice so there are 18 units of experiments of all. As malt dextrin concentration and drying temperature has real influence in observed parameter, it is followed by Duncan test.

2.5 Undertaking Experiment

The Making process of sinom beverage (Inayah, 2012 modification) is the process of: peel fresh turmeric, weighed 50 g, then washed. Add water with 1 : 1 ratio, then blend it for 3,5 minutes and squeeze it. The result is the extract of turmeric. For tamarind leaves, weighed 250g then wash it and add water with ratio of 5:1. The turmeric extract and

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