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Effect of Addition of Filler on the Production of Shallot (*Allium cepa* var. *ascalonicum* L.) Powder with Drum Dryer

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Abstract

Purpose of study was to see effect of type and concentration of filler in manufacture of shallot powder. Filler types were cassava starch 10, 30 and 50% and maltodextrin 1, 5, 10% . The most preferable product is cassava starch 10% and maltodextrin 1%, and the highest yield is at cassava starch 50% and maltodextrin 10%. At ash content, fat content, protein content, crude fiber content and vitamin C content, the best is on the addition of cassava starch 10% and maltodextrin 1%. The addition of cassava starch 10% and 5% is the best on crude fiber content and antioxidant activity.

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Introduction

Onion and shallot (*Allium cepa* var. *ascalonicum* L.) are annual plant that are widely grown throughout the year by farmers in Brebes, Central Java [1]. Shallots are widely used in Indonesia instead of onion which are widely grown and used overseas. According to [2], the onions become very important vegetable products, in the world onion production reached 55 million tonnes. Shallots is low land vegetable that is used by domestic consumers as every day seasoning, raw materials of food industry, and medicine. Shallot as traditional medicine are for febrifuge, diabetes, blood sugar and blood cholesterol, prevents thickening and hardening of the blood vessels, and ulcers [3].

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In Indonesia, planting the shallots into commercial farming has been carried out by farmers. Shallot cultivation efforts are not only done in Java and Sumatra. Based on [4], the largest shallot producing regions including Maluku, West Papua and Central Java at 867 tonnes, 680 tonnes, and 421 tonnes. Preliminary data from [5], onion production increased from 2011 to 2012 was 893 124 tonnes to 960 072 tonnes.

The abundance of shallot production need to be followed by good post- harvest handling . Bad handling is potentially cause bulb decay, germination, and a decline in selling prices to be very low. One of the ways that can be used to handle the increased production of shallot through shallot powder manufacturing. Shallot powder is widely used as an industrial raw material such as in snacks production, seasoning in cooking, and medicine. Drying technology that has been mastered are using oven dryes, coupled with anti browning material such as sodium meta bisulphite [6]. However, the use of sulphite will be the limitation to the product since sulphite is potentially cause some allergenic reactions in case of some consumers. In order to reduce the risk, the use dryer such as drum dryer coupled with natural acid such as citric acid can be used.

Drum dryer is a cylindrical dryer. This dryer is used specifically for drying the liquid material derived from agricultural products, such as fruit juice, soy milk, and others. Materials were dried with drum dryers in the form of slurry or solution. The drum rotates on a horizontal axis and is heated internally with steam or other heating medium [7]. Drum dryer consists of two types, namely single drum and double drum. Double drum drying is widely used for drying food products that will be processed into flour. This drying method is direct contact with the drum, before drying begins it has to change the product form to a liquid solution, suspension, and pasta with a certain viscosity only that can be dried. Double drum dryer consists of two hot hollow drums and they were passed by a steam as heating medium. This dryer produce porous and high quality product but sometimes generate browning on products when the raw material cannot stand the hot surface. Thus, it requires filler to prevent browning, to prevent loss of vitamin, color, aroma and other heat-sensitive substances.

Fillers acts as a protective layer and an outer wall of the material to be dried, so that they are protected from the loss of volatile components and denaturation [8]. Some fillers that are usually used for materials intended to be dried by drum drying are gum arabic, CMC, maltodextrin, cassava starch, etc. Maltodextrin is a glucose polymer with an average chain length ranges from 5-10 glucose units per molecule. Maltodextrin is a modified starch product madeby hydrolysis of starch, either by enzymatic or acid process [9]. According to [10], maltodextrin is defined as the hydrolysis products of starch-containing units of α -D-glucose which largely bound by 1,4 glycosidic bonds with DE (Dextrose Equivalent) of less than 20. Cassava starch is derived from the extraction of cassava tubers (*Manihot esculenta*). Starch is serve food material contained in a tuber, a compound which does not have the taste and smell of cassava, the starch present in the starch granule with size of 5 to 35 microns [11]. The levels of cassava starch and maltodextrin added have to be exact since if the the level to small there is no effect and so when the addition is excessive. Thus, the addition of filler is required to be optimised.

The aim of this reseach was to find the level of addition of cassava starch and maltodextrin to produce high quality shallot powder.

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