

Studies on the Spray-drying product of Bitter gourd Concentrate

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Summary

The aims of this study were to utilize the bioactive components of bitter gourd for developing their relative healthy food products, such as the product of concentrate and dehydrate-powder. Through developing their new healthy food products, the utilization and the appended value of this crop will also be exploited and increased, respectively. In recent year, our study was focused on the optimal spray drying conditions of bitter gourd and the anti-oxidative abilities in its raw materials included of the DPPH scavenging abilities, reducing power and Fe²⁺ chelating abilities. For investigating the influence of drying operation and material medium factors on the qualities of spray drying powder, the bitter gourd juice by pectin-hydrolyzed was first concentrated to soluble solid content of 15% by membrane filtration, and then further concentrated to 20%, 25%, 30% by vacuum at 50°C. And the effects of soluble solid content in bitter gourd, kinds and ratio of maltodextrin-adding, outlet and inlet drying temperature, and anti-caking agent added during drying courses on the recovery, color, flow-ability, bulk density, particle distribution of spray powder were discussed in detail. The results were showed as follows: Comparisons of the anti-oxidative activities between ethanol-extract and water extract from bitter gourd showed that: the DPPH scavenging abilities and reducing power in ethanol-extract was higher than in water-extract, whereas there are higher Fe²⁺ chelating abilities in water-extract than in ethanol-extract. As for optimal spray drying condition for bitter gourd powder, systematic approaches were performed, included of influence of soluble solid content of juice, carrier, outlet and inlet temperature and anti-caking agent. Results of influence of soluble solid content on recoveries, white index, flow-ability and bulk density for bitter gourd spray-drying power showed that: The higher soluble solid content in juice, the low recoveries, white index, and

the higher flow-ability were in spray-drying power. Contrary to the effect of soluble solid content in juice, the more malto-dextrin ratio added the higher recoveries, white index, and the lower flow-ability of drying powder were observed. In addition, our study also showed that: While the soluble solid content of bitter melon juice reached to 25-30 %, the recoveries and white index of bitter melon spraying powder with corn maltodextrin-adding were higher than that with potato maltodextrin-adding. Besides, adding tricalcium phosphate in bitter melon juice as anti-caking agent, increased the flow-ability of powder along with decreasing its bulk density, however, that was not significantly different for the recoveries and white index.

Keywords: Bitter melon, Membrane concentration, Spray-drying, Anti-oxidative ability

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