Product Formulation of Instant Powder Functional Drink from Black Jelly Grass and Other Natural Ingredients

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Abstract

The prevalence of type-II diabetes among Asian country citizens is very high. China, India and Indonesia are listed in the top five country in the world for both prevalence number and deaths. Research showed that the high prevalence was strongly related to socio-economic conditions of those countries. Instant powder drinks are very popular among citizens with lower socio-economic status. Functional drinks with low-carbohydrate content were seen as one of the best alternatives in campaign to decrease the diabetes prevalence number. The objective of the research is to find optimum product formulation of instant powder drinks made from black jelly grass (*Mesona palustris BL*), stevia leaves (*stevia rebaudiana*), lemon (*citrus lemon*) and clove (*Syzygium aromaticum*). No sugar added at all. The sweetness of the drink will be given by the extract of stevia leaves, a natural sweetener used by villagers. The research was carried out by a mixture design of experiment. The measured response variables are the level of antioxidants, phenol, flavonoid, vitamin C and pH level. The Design Expert software were used to develop the design of experiment and to analyze the result. The results show that the optimum formulation was found in a composition which gives the following parameters: a 201 ppm of total phenol, 72.61 ppm of flavonoid, 59.73% of antioxidant activity, 16.799 mg/mL of vitamin C and 5.05 of pH.

Biographies

Rois Fatoni, Ph.D. is currently an Associate Professor of Chemical Engineering at the Faculty of Engineering Universitas Muhammadiyah Surakarta. He also serves as Dean of the Faculty of Engineering. Before, he served as Department chair in Chemical Engineering Department in the same Faculty between 2014-2021. He holds an undergraduate degree in Chemical Engineering Department of Faculty of Engineering, Universitas Gadjah Mada, Jogjakarta, Indonesia, a Master's in Environmental Process Design, The University of Manchester, U.K., and a Ph.D. degree in Chemical Engineering Program of University of Waterloo, Canada in 2012. During his PhD studies he was supervised by Professors Ali Elkamel and Leonardo Simon. His research interests include modeling, simulation, optimization, scheduling, process safety, mixture design, advanced materials, biomass, and innovative technology for medium-small scale industries.

Hartini is currently a master's student in Chemical Engineering Master's Program, Faculty of Engineering Universitas Muhammadiyah Surakarta. She holds her Bachelor degree in Chemical Engineering in the same University. She also serves as laboratory staff in the same Department. Her works mostly related to product design and development of natural plants.

Professor Kun Harismah, PhD received his BSc in Chemistry Education from IKIP Semarang, Indonesia; an MSc in Chemistry from the Universitas Gadjah Mada, Jogjakarta, Indonesia and a Ph.D. in Organic Chemistry from Sheffield University, U.K., in 2009. She served in the Department of Chemical Engineering, Faculty of Engineering Universitas Muhammadiyah Surakarta. She also served as chair of Intellectual Property Center of the University (2017-now). She published numerous articles in refereed journal and conference proceedings. Her main interest is on the extraction and optimization of essential oils from various plants grown in Indonesia.

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