

## INTISARI

### KARAKTERISTIK FISIK, KIMIA DAN KOMPONEN SENYAWA VOLATIL YOGHURT BUBUK ENKAPSULASI DENGAN METODE *SPRAY DRYING*

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Yoghurt mengandung banyak senyawa volatil. Namun pada proses pengeringan menjadi yoghurt bubuk menggunakan *spray drying*, suhu tinggi dapat merusak komponen senyawa volatil yoghurt. Teknik enkapsulasi diyakini dapat menjadi solusi untuk melindungi yoghurt bubuk dari kehilangan flavor selama proses pengeringan, namun kemampuannya tergantung dari jenis enkapsulan yang digunakan. Penelitian ini mempelajari karakteristik fisik, kimia, analisis sensori dan juga komponen senyawa volatil yoghurt bubuk yang dienkapsulasi menggunakan dua jenis enkapsulan yakni susu skim dan maltodekstrin dengan konsentrasi 5%, 10% dan 15%. Yoghurt bubuk dibuat dengan penambahan enkapsulan skim dan maltodekstrin dengan konsentrasi 5%, 10% dan 15% menggunakan *spray drying* suhu inlet 110 °C dan suhu outlet 68-80 °C. Viabilitas sel BAL, pH, asam tertitrasi, kadar air, kadar protein, kelarutan, senyawa organik, analisis sensori dan komponen senyawa volatil diamati. Hasil penelitian menunjukkan bahwa kadar air semua sampel yoghurt bubuk sesuai dengan standar SNI untuk kadar air produk serbuk (3,85% -4,86%). Bakteri Asam Laktat masih mampu bertahan pada semua jenis enkapsulan pada yoghurt bubuk setelah mengalami proses pengeringan dengan *spray drying*. Namun, ketahanan bakteri terbaik ada pada yoghurt bubuk dengan enkapsulan susu skim. Yoghurt bubuk dengan enkapsulan susu skim sebanyak 15% memiliki persentase kadar protein tertinggi, sebesar 17,82 % b/b, asam laktat sebesar 7,6 g/L, viabilitas bakteri 8,38 log CFU/g. Yoghurt bubuk dengan enkapsulan maltodekstrin 15% memiliki pH yang paling rendah (3,92), total asam 0,87%, kadar air 3,85% dan % kelarutan tertinggi 89,02%, tingkat penerimaan panelis dengan skor 4,90 (agak disukai). Senyawa volatil dominan yang terdeteksi pada sampel yoghurt bubuk diantaranya acetoin, acetophenon, 6 - Methyl, 2- Heptanol, Ethyl Hexanol, acetic acid, dan juga styrene. Maltodekstrin 15%, merupakan enkapsulan yang paling baik digunakan dalam penelitian ini ditinjau dari pH, total asam, kadar air, kelarutan, penerimaan konsumen dan juga kandungan senyawa volatil.

**Kata kunci:** yoghurt bubuk, enkapsulasi, *spray drying*, senyawa volatil yoghurt

## ABSTRACT

### PHYSICOCHEMICAL CHARACTERISTICS AND VOLATILE COMPOUND OF YOGURT POWDER ENCAPSULATION USING SPRAY DRYING METHOD

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Yogurt contains many volatile compounds. However, in the drying process into yogurt powder using spray drying, high temperatures can damage the volatile components of yogurt. The encapsulation technique is believed to be a solution to protect yogurt powder from losing volatile compounds during the drying process. Still, its ability depends on the type of encapsulation used. This study investigated the physicochemical characteristics, sensory properties, and volatile components profile of yogurt powder that were encapsulated using 2 types of encapsulants, skim milk and maltodextrin with concentrations of 5%, 10%, and 15%. Yogurt powder was made by adding skim encapsulant and maltodextrin with 5%, 10% and 15% concentrations using spray drying at an inlet temperature of 110°C and an outlet temperature of 68-80°C. LAB cell viability, pH, titratable acidity, water content, protein content, solubility, organic compounds, sensory properties, and volatile compound profiles were investigated. The results showed that the moisture content of all samples of yogurt powder was in accordance with the SNI standard for the water content of powdered products (3,85% - 4,86%). Lactic acid bacteria can still survive on all types of encapsulation in yogurt powder after undergoing the drying process by spray drying. However, the best bacterial survival was found in yogurt powder with skim milk encapsulation. Yogurt powder with skim milk as much as 15% has the highest percentage of protein content, 17,82% w/w, lactic acid at 7,6 g/L bacterial viability 8,38 log CFU/g. Yogurt powder with encapsulated maltodextrin 15% has the lowest pH (3,92), total acid 0,87%, water content 3,85%. The highest % solubility was 89,02%, and consumer acceptance with a score of 4,90 (slightly preferred). The dominant volatile compounds detected in this sample include acetoin, acetophenone, 6-methyl, 2-heptanol, ethyl hexanol, acetic acid, and styrene. Yogurt powder with 15% maltodextrin is the best encapsulant used in this study in terms of pH, total acid, water content, solubility, consumer acceptance, and the content of volatile compounds contained in yogurt powder after the drying process using a spray dryer.

**Key words:** yogurt powder, encapsulation, spray drying, volatile compound