LEMBAR
HASH PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMtAH: JURNALILMIAH

Judul Karya Ilmiah (Artikel) : The effect of spray-drying inlet conditions on iron encapsulation using hydrolysed glucomannan as a matrix

Jumlah Penulis : 6 orang

Status Pengusul : Penulis pertama/ ~~penulis ke – 3~~/ penulis korespondensi

Identitas Jurnal Ilmiah :

a. Nama Jurnal : Food and Bioproducts Processing
b. Nomor ISSN : ISSN: :0960-3085
c. Volume, nomor, bulan, tahun : Vol. 123, pp.72-79, 2020
d. Penerbit : Institution of Chemical Engineers
e. DOI Artikel : 10.1016/j.fbp.2020.05.013
f. Alamat Web

JURNAL : https://www.sciencedirect.com/journal/food-and-bioproducts-processing/vol/123/suppl/C
ARTIKEL : https://www.sciencedirect.com/science/article/abs/pii/S096030852030434X?via%3Dihub

g. Terindeks : Scopus/Sdmagojr/SJR=1,03 (2019) dan Q1

Kategori Publikasi Jurnal Ilmiah (Beri √ pada katergori yang tepat)

- [✓] Jurnal Ilmiah Internasional
- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen yang dinilai	Nilai Reviewer		Nilai rata-rata
	Reviewer 1	Reviewer 2	
a. Kelengkapan unsur isi Artikel (10%)	4	4	4
b. Ruang lingkup dan kedalaman pembahasan (30%)	**11,2**	11.6	11,4
c. Kecukupan dan kemutakhiran data/ informasi dan metodologi (30%)	11,6	11,6	11,6
d. Kelengkapan unsur dan kualitasterbitan/ jumal (30%)	11,2	**12**	11,6
Total = (100%)	**38**	**39,2**	**38,6**
Nilai Pengusul (kontribusi pengusul sebagai penulis pertama) = (60% x 38,6)			**23,16**

Semarang, Februari 2021

Reviewer II

Prof. Tutuk Djoko Kusworo, S.T., M.Eng, Ph.D.
NIP. 197306211997021001
Unit Kerja : Departemen Teknik Kimia FT UNDIP

Reviewer I

Prof. Dr. Ir. Bambang Pramudono, M.S.
NIP. 195203121975011004
Unit Kerja : Departemen Teknik Kimia FT UNDIP

LEMBAR
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e. DOI Artikel : 10.1016/j.fbp.2020.05.0t3
f. Alamat Web
JURNAL : https://www.sciencedirect.com/journal/food-and-bioproducts-processing/vol/123/suppl/C
ARTIKEL : httDs://www.sciencedirect.com/science/article/abs/Dii/S096030852030434X?via%3Dihub
9. Terindeks : Scopus/Scimagojr/SJR=1,03 (2019) dan Q1

Kategori Publikasi Jurnal Ilmiah (Beri √ pada katergori yang tepat)
[✓] Jurnal Ilmiah Internasional
[ ] Jurnal Ilmiah Nasional Terakreditasi
[ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen yang dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir yang diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi Artikel (10%)	4			**4**
b. Ruang iingkup dan kedalaman pembahasan (30%)	12			**11,2**
c. Kecukupan dan kemutakhiran *datal* informasi dan metodologi (30%)	12			**11,6**
d. Kelengkapan unsur dan kuaiitas terbitan/ jumal (30%)	12			**11,2**
Total = (100%)	**40**			**38**
Nilai pengusul = 60 % x 38				**22,8**

Catalan penilaian artikel oleh Reviewer

1. Kesesualen dan kelengkapan unsur isi iumal:
Kelengkapan unsur artikel balk dan lengkap

2. Ruang lingkup dan kedalaman pembahasan:
Ruang lingkup artikel cukup luas yaitu mengkaji temperatur outlet gas, moisture content, dan loading capacity dari encapsulated iron pada berbagai temperatur inlet gas. Juga dibahas pengaruhnya terhadap solubility, swelling, particle size distribution dan lain2. Pembahasan cukup luas namun kurang dalam. Sebagian pembahasan hasilnya dibandingkan dengan para peneliti sebelumnya. Dari jumlah citation in text pada bab pembahasan ini terdapat 36 sitasi (sekitar 75 %) dari 48 daftar pustaka.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:
- Kemutakhiran data/informasi dan metode penelitian cukup baik. Referensi 10 tahun terakhir dari jumal, atau buku sebanyak 41 dan 48 daftar pustaka, atau **65,4 %**.

4. Kelengkapan unsur dan kuaiitas terbitan/jurnal:
Jurnal ini terindex di Scopus, dengan SJR = 1,027. Editorial board dari berbagai negara, terdapat pedoman penulisan (guide for authors), format penulisan konsisten. Artikel yang disajikan penulis dari berbagai negara. Penerbit jumal ini adalah Institution of Chemical Engineers. ISSN : 0960-3085. Jumal ini dapat digolongkan jumal internasional bereputasi.

Catatan: - Editing gambar / penempatan kurang baik atau kurang cermat

Semarang, 22 Desember 2020
Reviewer I

Prof. Dr.Ir. Bambang Pramudono, M.S.
NIP. 195203121975011004
Unit Kerja : Departemen Teknik Kimia FT UNDIP

LEMBAR
HASH PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYAILMIAH: JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	The effect of spray-drying inlet conditions on iron encapsulation using hydrolysed glucomannan as a matrix
Jumlah Penulis	:	6 orang
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Identitas Jurnal Ilmiah	:	a. Nama Jurnal : Food and Bioproducts Processing b. Nomor ISSN : ISSN: :0960-3085 c. Volume, nomor, bulan, tahun : Vol. 123, pp.72-79, 2020 d. Penerbit : Institution of Chemical Engineers e. DOI Artikel : 10.1016/j.fbp.2020.05.013 f. Alamat Web JURNAL : https://www.sciencedirect.com/journal/food-and-bioProducts-Processing/vol/123/supol/C ARTIKEL : https://www.sciencedirect.com/science/article/abs/pii/S096030852030434X?via%3Dihub g. Terindeks : Scopus/Scimagojr/SJR=1,03 (2019) dan Q1

Kategori Publikasi Jurnal Ilmiah (Beri √ pada katergori yang tepat)
- [✓] Jurnal Ilmiah Intemasional
- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review*

Komponen yang dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir yang diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi Artikel (10%)	4			4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,6
c. Kecukupan dan kemutakhiran data/ informasi dan metodologi (30%)	12			11,6
d. Kelengkapan unsur dan kualitas terbitan/ jumal (30%)	**12**			12
Total = (100%)	**40**			39,2
Nilai pengusul = 60 % x 39,2				**23,52**

Catatan penilaian artikel oleh Reviewer:

a. Kelengkapan unsur isi artikel (10%) Artikel ini memiliki unsur yang lengkap (Abstract, Introduction, Method, Results & Discussion, Conclusion, References). State of the art dan tujuan dinyatakan dengan jelas. Penulisan daftar pustaka dan *in-text citation* konsisten dan sesuai dengan petunjuk penulisan. Hasil cek plagiarisme dengan Turnitin menunjukkan kesamaan sebesar 21 %. → (nilai = 10 %)

b. Ruang lingkup dan kedalaman pembahasan (30%) Pendahuluan ditulis dengan baik latarbelakang juga telah dielaborat dengan permasalahan yang ada dan menunjukan urgensi penelitian yang ditunjukan dengan referensi yang digunakan sekitar 21 buah. Hasil penelitian dibahas dengan sangat baik, pembahasan dilakukan dengan mengelaborate penelitian terdahulu. Hal ini dibuktikan dengan total referensi yang digunakan sejumlah 47, yang digunakan pada pembahasan adalah 17 buah atau sebesar 36%.. → (nilai = 29 %)

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Referensi yang dicitasi dalam artikel ini ada 47, dengan 40 (85 %) diantaranya adalah baru (10 tahun terakhir). Hal ini menunjukan kemuthakhiran referensi yang digunakan. Metode penelitian yang digunakan juga ditulis sangat ringkas dan sangat jelas. → (nilai = 29%)

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Food and Bioproducts Processing merupakan jurnal internasional bereputasi (Q1) dengan Penerbit Institution of Chemical Engineers. Jurnal ini memiliki ISSN 0960-3085 url, scope, dan informasi terbitan yang jelas. Jurnal ini terindeks pada Scopus dengan SJR (2019) = 1,03. Editoril board terdiri dari pakar-pakar dari beberapa negara. Author Guideline dan mekanisme pengiriman artikel jelas. → (nilai = 30 %)

Semarang, 2 Febuari 2021
Reviewer II

Prof. Tutuk Djoko Kusworo, S.T., M.Eng, Ph.D.
NIP. 197306211997021001
Unit Kerja : Departemen Teknik Kimia FT UNDIP

DOCUMENT DETAILS

Food and Bioproducts Processing
Volume 123, September 2020, Pages 72-79

The effect of spray-drying inlet conditions on iron encapsulation using hydrolysed glucomannan as a matrix (Article)

Wardhani, D.H., Wardana, I.N., Ulya, H.N., Cahyono, H., Kumoro, A.C., Aryanti, N.

Department of Chemical Engineering, Faculty of Engineering, Diponegoro University, Jl. Prof. Soedarto, SH, Semarang, Central Java, 50275, Indonesia

Abstract

View references (48)

Spray-drying is an encapsulation method that can be used to protect iron from oxidation. Hydrolysed glucomannan has shown potential as an encapsulant due to its ability to form a fine, dense network upon drying. The aim of this study was to evaluate the potential of hydrolysed glucomannan as a matrix for iron at inlet air temperatures of spray-drying of 110 °C, 120 °C, 130 °C and 140 °C. The physicochemical properties and performance of the iron encapsulation powder were determined. The results indicated that the inlet air temperature influences the properties and performance of the powder. An increase in the inlet air temperature from 110 °C to 140 °C led to a greater loading capacity and particle size distribution but had an insignificant impact on the moisture content, solubility and swelling. Higher drying air temperatures tended to produce a darker powder. The morphological analysis revealed that higher inlet drying air temperatures produced powders with rounder shapes, whereas lower temperatures produced irregular shapes that tended to form deep concavities on the powder surface. The samples from all inlet temperatures showed similar functional groups but in different intensities. The release of iron at pH 6.8 was higher for the lower inlet temperatures. Samples with the highest inlet temperature showed the highest performance in protecting iron from oxidation. Considering the performance, 130 °C is recommended as the inlet air temperature for iron spray-drying encapsulation using hydrolysed glucomannan .

SciVal Topic Prominence

Topic: Spray Drying | Maltodextrins | Drug Formulations

Prominence percentile: 99.308

Chemistry database information

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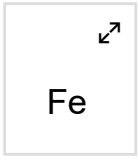

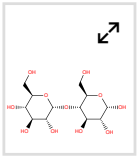

Author keywords

Glucomannan encapsulant | Hydrocolloid | Hydrolised glucomannan | Iron encapsulation | Spray-drying

Indexed keywords

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Tontul, I. , Topuz, A.
(2017) Trends in Food Science and Technology

Optimization of the spray drying process for developing cupuassu powder

Pombo, J.C.P. , de Medeiros, H.H.B.R. , Pena, R.S.
(2020) Journal of Food Science and Technology

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Engineering controlled terms: Atmospheric temperature | Hydrolysis | Particle size | Particle size analysis | Physicochemical properties | Spray drying | Thermal load

Engineering uncontrolled terms: Drying air temperatures | Encapsulation methods | Inlet air temperatures | Inlet conditions | Inlet temperature | Loading capacities | Lower temperatures | Morphological analysis

Engineering main heading: Iron

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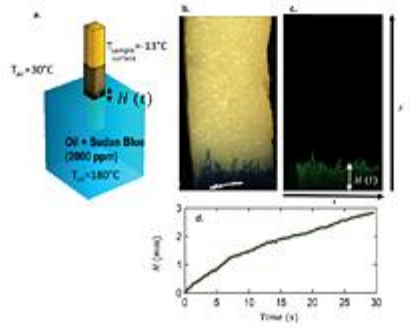

Cover image by Touffet et al., 'Revisiting the mechanisms of oil uptake during deep-frying', *Food and Bioproducts Processing*, 123 (2020), Pages 14-30

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Anisotropic diffusion assessment in salmon (*salmo salar*) composite muscle tissue: Theoretical and image-processing experimental approaches

Wladimir Silva-Vera[a,*], *Cristian Ramírez*[a,b], *Marlene Pinto*[a], *Ricardo Simpson*[a,b], *Sergio Almonacid*[a,b]

[a] *Chemical and Environmental Engineering Department, Federico Santa María Technical University, Av. España 1680, Valparaíso, Chile*

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Anisotropic diffusion
Salmon composite muscle
Image processing
Mass transfer modeling
Diffusion coefficient
Distribution coefficient

ABSTRACT

A simple method to study the diffusion of a probe molecule into muscle tissue, which considers real composite architecture and anisotropy, was proposed. An anisotropic diffusion study of methylene blue (MB) as a probe molecule into the composite muscle tissue of salmon (*Salmo salar*) was performed using an image-processing technique. The concentration profile was determined in the middle sagittal plane by considering the muscle fiber orientation angle (θ). The mean value of the angle was $\theta = 31 \pm 1.2^{\circ}$, and the fractional anisotropy values showed an anisotropic behavior for all samples tested. The presence of the discontinuity between muscle and connective tissue was characterized by the distribution coefficient. The simulation using the generalized minimum residual method iterative solver in COMSOL Multiphysics™ software described the anisotropic condition of the tissue with root mean square values of less than 27%. Significant differences were found in effective diffusion coefficient values between the muscle and connective tissue at 2 °C (p-value < 0.05). Further studies may consider other diffusing molecules and muscle tissues.

1. Introduction

Studies of the mass transfer phenomena of compounds (additives and gases) through meat and fish tissue provide relevant information about processing time, microbiological stability, and organoleptic characteristics, and they also yield information about the interaction between products and polymer coatings over time (Bencze Rørå et al., 2004; Gómez-salazar et al., 2015; Graiver et al., 2006). In this sense, a variety of solutes for different purposes have been infused into fish muscle to provide protection against loss of protein functionality due to long-term storage at refrigeration temperatures. Marinating and brining techniques are used to provide cryoprotection, flavoring, acidification, texture effects and color (Alizadeh et al., 2009; Cabrer et al., 2002; Goeller et al., 2004; Simpson et al., 2018; Wang et al., 2000), and several solutes are commonly used for these applications, including sodium chloride, calcium chloride, lemon juice, citric acid, acetic acid, and tripolyphosphates. Additionally, the generation of protein hydrolysates obtained from food proteins has attracted attention because of their valuable, multifunctional and healthy technological characteristics (i.e., antioxidative, antihypertensive, anti-inflammatory, water retention, and bitter blocking capabilities), which make them promising new ingredients that can be infused into muscle tissue (Zhang et al., 2018). To ensure a maximum and even effect throughout the tissue, it is essential to understand the diffusion mechanisms within the tissues of interest. Thus, many studies have focused on the diffusion processes of solutes into fish muscle by applying Fick's law of diffusion, using assumptions or approximations

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Effects of dual-frequency ultrasound with different energy irradiation modes on the structural and emulsifying properties of soy protein isolate

Liurong Huang[a,b,*], *Wenxue Zhang*[a], *Xiaona Ding*[a], *Zhengfen Wu*[a], *Yunliang Li*[a]

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ABSTRACT

The effects of dual-frequency ultrasound pretreatments with different energy irradiation modes, including energy-gathered ultrasound (EGU), energy-divergent ultrasound (EDU) and slit ultrasound (SU) on the solubility and emulsifying properties of soy protein isolate (SPI) were investigated. The surface hydrophobicity, intrinsic fluorescence spectra, and circular dichroism spectra of SPI were determined. Results revealed that all ultrasonic pretreatments increased the solubility of SPI significantly ($P \leq 0.05$). Ultrasonic pretreatments with EDU and SU could not improve the emulsifying activity ($P > 0.05$). The emulsion stability index of SPI treated by EGU was higher than those of EDU and SU with the same ultrasonic time and power density. Changes in surface hydrophobicity and intrinsic fluorescence showed the unfolding of protein and exposure of hydrophobic groups as a result of action of ultrasound. The CD spectra of SPI pretreated by optimal EGU, EDU and SU showed that dual-frequency ultrasound induced the decrease of β-sheet contents and increase of α-helix and random coil contents significantly ($P \leq 0.05$). In conclusion, the influence of EGU on the structural and emulsifying properties of SPI was more significant than those of EDU and SU.

1. Introduction

In the soybean oil extraction industry, a large number of defatted soy flakes are obtained and typically ground into meal for animal feed. Soybean meal contains about 35–45% (w/w) protein, which is rich in essential and balanced amino acids (Van Etten et al., 1959). The use of soybean protein has been of increased interest, primarily attributed to its high nutritional value, steady supply, and low cost compared to other cereal protein (Chen et al., 2012). One important functional property of protein is its ability to stabilize emulsions by adsorbing to the interface between air and water or oil and water, hence lowering the interfacial tension of the interface film (Foegeding and Davis, 2011). However, the compact globular structure of native soy protein isolate (SPI) always limits its interfacial and emulsifying properties (Fernandez-Avila and Trujillo, 2016). Therefore, a more efficient modification method should be developed to overcome the shortcoming.

In recent years, ultrasound technology was widely applied in the extraction of target compounds, production of bioactive peptides and modification of biological molecules. Owing to its cavitation, thermal and mechanical effects, ultrasound can unfold protein structure and improve its functional properties (Cheng et al., 2019; Yang et al., 2018). Acoustic cavitation is considered as the most important factor that influences the ultrasonic treatment effect (Leighton, 1995). The sensi-

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Food and Bioproducts Processing

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Including cleaning and production phases in the eco-design of a milk evaporation process

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[b] Laboratoire de Génie Chimique, UMR5503 CNRS, Université de Toulouse, ENSIACET INPT/UPS, BP 84234, F-31432 Toulouse, France
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ABSTRACT

The cleaning phase is seldom included in the eco-design of food processes, since few cleaning kinetics models exist. The goal of this study was to investigate benefits of including a cleaning kinetics model, which considers three major operating parameters of cleaning (concentration, temperature and flow rate), in the eco-design of a food process. To this end, we developed an eco-design approach for a dairy evaporator process that includes both production and cleaning phases. A cleaning kinetics model was selected to predict cleaning duration as a function of the operating parameters of cleaning. Cleaning duration also depends on the fouling surface density, which depends on the duration of the production phase. Fouling surface density was predicted using three hypothetical fouling kinetics laws. After optimization, environmental and economic improvements were observed in process performance. The evaporation process is optimized at a high cleaning temperature (95 °C), a flow-rate similar to that used during the production phase and a low caustic soda concentration (<2%). This study highlights that to optimize food processes in a more precise way, cleaning kinetics should be included and used to identify parameters that influence performance of the overall process.

1. Introduction

Cleaning-in-place (CIP) is commonly used in the food industry to ensure hygienic safety of foods and recover plant performance; however, it has high operating and investment costs (Tamime, 2009) and environmental impacts (Eide et al., 2003). This is particularly true in the dairy industry, which has long non-production periods dedicated to CIP (4–6 h per day) and a huge volume of effluents generated by CIP (50–95% of the volume of waste sent to the wastewater treatment facility, regardless of the type or size of the plant or equipment (Marty, 2001; Sage, 2005)).

Eco-design and optimization of food processing have attracted much attention in the past two decades (Stefanis et al., 1997; Banga et al., 2008; Erdoğdu, 2008; Sharma et al., 2012). Ecodesign is an environmental management approach that aims at integrating environmental issues into the product development process, in order to improve the environmental performance of a product across its entire life cycle. However, the CIP procedure has rarely been considered. The literature indicates that three approaches have been used to address CIP in the eco-design of food processes, but none of them has included cleaning kinetics models, which represent the major operating parameters of cleaning:

- The first approach uses Life Cycle Assessment to identify the alternative CIP procedure with the lowest environmental impacts by comparing multiple CIP procedures (Eide and Ohlsson, 1998; Eide, 2002; Eide et al., 2003). This approach

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