MEDIA GIZI Indonesia
p ISSN 1693-7228
e ISSN 2540-8410

Vol. 17 No. 1SP (2022): Media Gizi Indonesia (National Nutrition Journal) Special Issue: International Conference on Stunting 2022

Current Issue

Jurnal Ilmiah
MEDIA GIZI Indonesia
Accredited by SINTA Indonesia (SINTA 2)
SK DITJEN RISBANG KEMENRISTEKDIKTI RI NO 3/E/KTP/2019
(National Nutrition Journal)

p-ISSN 1693-7228
e-ISSN 2540-8410
Vol. 17 | No. 1 | Page 1 – 263 | Special Edition 2022

Vol. 17 No. 1SP (2022): Media Gizi Indonesia (National Nutrition Journal) Special Issue: International Conference on Stunting 2022

Published: 2022-12-15

Front Matter

Front Matter Jurnal MGI 2022 Special Issue

DOI : 10.20473/mgi.v17i1SP.%p
Abstract : 198
PDF : 211

PDF

Special Issue: International Conference on Stunting 2022

Perbandingan Metode Online dan Offline dalam Peningkatan Awareness Calon Pengantin Terhadap Gizi Prakonsepsi Sebagai Upaya Pencegahan Stunting pada Kursus Persiapan Pernikahan

DOI : 10.20473/mgi.v17i1SP.1-5
Dominikus Raditya Atmaka , Nila Reswari Haryana , Qonita Rachmah , Stefania Widya Setyaningtyas , Anisa Lailatul Fitria , Azizah Ajeng Pratiwi , Aliffah Nurria Nastiti , Asri Meidyah Agustin , Rian Diana , Mahmud Aditya Rifqi
1-5
Abstract : 712
PDF : 458

PDF

Diversification of local products based on Wet Protein Isolate of Catfish (Clarias Sp) as a protein source to prevent stunting

DOI : 10.20473/mgi.v17i1SP.6-12
Patmawati , Wini Trilaksani , Widati Fatmaningrum , Siti Rahayu Nadhiroh
6-12
Abstract : 347
PDF : 156

PDF

GAMBARAN PENYEBAB KELUARGA BERISIKO STUNTING DI KABUPATEN BOJONEGORO

Overview of the Causes of Families at Risk for Stunting in Bojonegoro District

DOI : 10.20473/mgi.v17i1SP.13-21
Endah Budi Permana Putri , Faradila Putri Namira , Achmad Syafiuddin
13-21
Abstract : 491
PDF : 314

PDF

PROGRAM DAN INTERVENSI PEMBERIAN MAKAN BAYI DAN ANAK (PMBA) DALAM PERCEPATAN PENANGGULANGAN STUNTING

DOI : 10.20473/mgi.v17i1SP.22-30
Nur Mufida Wulan Sari , Farah Rosyihana Fadhila , Ulfatul Karomah , Emyr Reisha Isaura , Annis Catur Adi
22-30
Abstract : 495
PDF : 367

PDF

POTRET PERSEPSI NILAI GENDER DALAM PROGRAM PERCEPATAN PENURUNAN STUNTING DI DESA SUKOJEMBER, KECAMATAN JELBUK, KABUPATEN JEMBER

DOI : 10.20473/mgi.v17i1SP.31-38
Atik Rahmawati , Ni mal Baroya , elok permatasari , Globila Nurika , Leersia Yusi Ratnawati
31-38
Abstract : 381
PDF : 317

PDF

Relevansi Intervensi Perbaikan Sanitasi untuk Mencegah Kejadian Stunting Masa Pandemi COVID-19 di Indonesia: Meta Analisis

DOI : 10.20473/mgi.v17i1SP.39-46
Nabila Mutia Rahma , Dominikus Raditya Atmaka , Anisa Lailatul Fitria , Azizah Ajeng Pratiwi , Qonita Rachmah , Alifah Nurria Nastiti , Asri Meidyah Agustin , Lilis Sulistyorini
39-46
Abstract : 521
PDF : 213

PDF

PENINGKATAN PENGETAHUAN GIZI TERKAIT MAKANAN PENDAMPING ASI (MP-ASI) MELALUI EDUKASI DAN HANDS-ON-ACTIVITY PADA KADER DAN NON-KADER

DOI : 10.20473/mgi.v17i1SP.47-52
Qonita Rachmah , Lailatul Muniroh , Atmaka Dominikus Raditya , Fitria Anisa Lailatul , Pratiwi Azizah Ajeng , Agustin Asri Meidyah , Nastiti Aliffah Nurria , Arum Damar Aditya Bayu Sukma , Helmyati Siti , Wigati Maria
47-52
Abstract : 428
PDF : 188

PDF

Kampanye Partisipatory Anti-Stunting dengan Menggunakan Sosial Media Tiktok di Jawa Timur

DOI : 10.20473/mgi.v17i1SP.53-57
Bunga Farida , Siti Rahayu Nadhiroh , Edi Dwi Riyanto , Mochammad Bagus Qomaruddin , Shrimarti Rukmini Devy , Em Trisna Juwita
53-57
Abstract : 272

PDF : 125

PDF

GAMBARAN PENGETAHUAN STAKEHOLDER TENTANG STUNTING DALAM UPAYA PERCEPATAN DESA EMAS DI KABUPATEN MOJOKERTO

DOI : 10.20473/mgi.v17i1SP.58-63
Ni Njoman Juliasih , Eko Budi Santoso , Ade Lia Ramadani , Sugiharto
58-63
Abstract : 225
PDF : 78

PDF

Penta-helix “Desa Emas” As A Commitment to Accelerate Stunting Reduction in Sumenep Regency, East Java Province

DOI : 10.20473/mgi.v17i1SP.64-75
Nuraini Fauziah , Qurnia Andayani , Septi Ariadi , Toetik Koesbardiati , Bayu Praharsena
64-75
Abstract : 286
PDF : 99

PDF

REGIONAL MAPPING IN BANGKALAN DISTRICT BASED ON POTENTIAL INDICATORS OF TOTAL STUNTING USING K-MODE CLUSTER ALGORITHM

DOI : 10.20473/mgi.v17i1SP.76-82
Adma Novita Sari , Dzuria Hilma Qurotu’ain , Faradilla Harianto , Sa'idah Zahrotul Jannah
76-82
Abstract : 241
PDF : 93

PDF

The Correlation between Food Security with Stunting Toodler from Fisherman Family

DOI : 10.20473/mgi.v17i1SP.83-89
Warda Eka Islamiah , Siti Rahayu Nadhiroh , Endah Budi Permana Putri , Farapti , Chyntia Apris Christiwan , Priskila Kris Prafena
83-89
Abstract : 279
PDF : 302

PDF

Determinant of Adherence to iron supplementation in Adolescent Girl In Spesific Intervention For Stunting Prevention: Systematic Review

DOI : 10.20473/mgi.v17i1SP.90-96

Alma Feriyanti , Nafiatus Sintya Deviatin , Ira Nurmala , Sri Widati , Dominikus Raditya Atmaka
90-96

Peta Potensi Pengentasan Stunting di Kota Surabaya

DOI : 10.20473/mgi.v17i1SP.97-103
Endang Retno Surjaningrum , Eldatia Utari Putri , Nur Ainy Fardana N. , Lucia Tri Suwanti , Lutfi Agus Salim , Esti Yunitasari , Bani Bacan Hacantya Yudanagara , Lantip Muhammad Dewabrata
97-103

EDUKASI PEMBERIAN MAKANAN TAMBAHAN BERBASIS BAHAN LOKAL UNTUK BALITA STUNTING DENGAN MEDIA ANIMASI

DOI : 10.20473/mgi.v17i1SP.104-111
Pipit Festi Wiliyanarti Wiliyanarti , Dede Nasrullah , Royyan Salam , Idam Cholic
104-111

POTENSI BALITA RISIKO STUNTING DAN HUBUNGANNYA DENGAN KELUARGA PRA-SEJAHTERA DI JAWA TIMUR: ANALISIS DATA PK-21

DOI : 10.20473/mgi.v17i1SP.112-119
Siti Rahayu Nadhiroh , Edi Dwi Riyanto , Sa'idah Zahrotul Jannah , Ika Savitri Salsabil
112-119

The The Role of Family Companions in Reducing Stunting

PERAN PENDAMPING KELUARGA DALAM MENURUNKAN STUNTING

DOI : 10.20473/mgi.v17i1SP.120-126
Uliyatul Laili , Endah Budi Permana Putri , Lailatul Khusnul Rizki
120-126

Pembuatan Protipe Sarana Air Bersih Sebagai Solusi Alternatif Percepatan Penurunan Stunting di Kabupaten Pacitan

DOI : 10.20473/mgi.v17i1SP.127-138
Deti Rahmawati , Eddy Setiadi Soedjono , Soedarso Soedarso , Nastasia Festy Margini , Mukodi Mukodi
127-138
Abstract : 191
PDF : 210

PDF

ANALISIS SITUASI UPAYA PERCEPATAN PENURUNAN STUNTING DENGANPENDEKATAN KELUARGA BERISIKO STUNTING (Studi Kasus di Kabupaten Jombang Jawa Timur)

DOI : 10.20473/mgi.v17i1SP.139-144
Widati Fatmaningrum , Siti Rahayu Nadhiroh , Agus Raikhani , Budi Utomo , Luluk Masluchah , Patmawati
139-144
Abstract : 794
PDF : 330

PDF

Status Ekonomi Keluarga dan Kecukupan Gizi dengan Kejadian Stunting pada Anak Usia 6-24 Bulan di Kota Surabaya

DOI : 10.20473/mgi.v17i1SP.145-152
Hasanah Ayuningtyas , Siti Rahayu Nadhiroh , Zida Sinata Milati , Alfin Lailatul Fadilah
145-152
Abstract : 423
PDF : 733

PDF

The association of sanitation, birth history, and nutritional status on the incidence of diarrhea among children under five in Zambia, South Africa

DOI : 10.20473/mgi.v17i1SP.153-160
Wizara Salisa , Trias Mahmudiono , Mahmudah
153-160
Abstract : 200
PDF : 81

PDF

Analisis Faktor Risiko Maternal terhadap Keluarga Berisiko Stunting

Studi di Kabupaten Jember, Jawa Timur, Indonesia

DOI : 10.20473/mgi.v17i1SP.161-167
Dr. Elok Permatasari, M.Kes. , Leersia Yusi Ratnawati , Ni'mal Baroya , Globila Nurika , Farida Wahyu Ningtyias , Andrei Ramani
161-167
Abstract : 258
PDF : 180

PDF

Determinants that Contributes to Stunting Prevention Behavior in Pregnant Woman in Indonesia

DOI : 10.20473/mgi.v17i1SP.168-174
Nafiatus Sintya Deviatin , Alma Feriyanti , Shrimarti Rukmini Devy , Muji Sulistyowati , Leersia Yusi Ratnawati , Qurnia Andayani
168-174
Abstract : 246
PDF : 149

PDF

PROFIL PENGUNAAN ALAT KONTRASEPSI PADA WANITA USIA SUBUR DI KECAMATAN PUJER, KABUPATEN BONDOWOSO, JAWA TIMUR

DOI : 10.20473/mgi.v17i1SP.175-179
Dwi Martha Nur Aditya , Sawitri Boengas , Rivan Virlando Suryadinata , Dita Sukmaya Prawitasari , Winnie Nirmala Santosa
175-179
Abstract : 197
PDF : 99

PDF

Evaluating Change Behaviour Training Model for Improving Nutrition Knowledge and Counseling Skill among Peer Couselors in Malang District

DOI : 10.20473/mgi.v17i1SP.180-185
Nurul Muslihah , Intan Yusuf Habibie , Annisa Rizky Maulidana , Netty Dyah Kurniasari , Bunga Farida , Ririn Harini
180-185
Abstract : 154
PDF : 152

PDF

MODIFIKASI EDUKASI DAN PENDAMPINGAN GIZI IBU BALITA CEGAH STUNTING MELALUI KEGIATAN “HEALTHY FOOD COOKING CLASS”

DOI : 10.20473/mgi.v17i1SP.186-192
Dwi Faqihatus Syarifah Has , Eka Srirahayu Ariestiningsih , Nur Cahyadi , Amalia Rahma , Endah Mulyani , Diah Fauziya Zuhro
186-192
Abstract : 226
PDF : 121

PDF

Buang Air Sembarangan dan Stunting

DOI : 10.20473/mgi.v17i1SP.193-199
Inne Soesanti Soesanti , Dian Shofiya , Winarko Winarko , Mujayanto Mujayanto , Rahmania Rahmania

193-199
Abstract : 218
PDF : 126

PDF

Women in Health Communication The Role of Family Assistance Teams (TPK) in Accelerating Stunting Reduction in East Java

Women in Health Communication The Role of Family Assistance Teams (TPK) in Accelerating Stunting Reduction in East Java

DOI : 10.20473/mgi.v17i1SP.200-210
Netty Dyah Kurniasari , Emy susanti , Yuyun WI Surya
200-210
Abstract : 216
PDF : 158

PDF

Komitmen Pimpinan Pada Penurunan Stunting Di Kabupaten Tuban Jawa Timur

DOI : 10.20473/mgi.v17i1SP.211-214
Dian Shofiya , Inne Soesanti , Rachmaniah , Winarko , Mujayanto , Sa'idah Zahrotul Jannah
211-214
Abstract : 344
PDF : 155

PDF

PENINGKATAN KETAHANAN PANGAN DAN PENGENTASAN STATUS KEMISKINAN DALAM KONVERGENSI PENURUNAN ANGKA STUNTING

Food Security Integration and Poverty Status Reduction in the Convergence of Stunting Reduction

DOI : 10.20473/mgi.v17i1SP.215-220
Faraiesa Nurahadiyatika , Dominikus R. Atmaka , Aghnia Ilmi Imani
215-220
Abstract : 485
PDF : 151

PDF

Penurunan Prevalensi Stunting Di Desa Sudimoroharjo Kabu-paten Nganjuk Sebagai Luaran Program Pendampingan Intensif Lintas Sektor Kepada Ibu Dengan Baduta Stunting

DOI : 10.20473/mgi.v17i1SP.221-229
Cleonara Yanuar Dini , Farida Farah Zakiya , Dwi Apriliani , Aisyaturida Amelia , Larastiti Windatari , Cindy Gita Chayani , M. Thoriq Aqilalhasib , Decca Pinky Nugroho , Shannon Ellya Marolop , David Aditya , Maulana Suryananda R , Dwi Anindya A , Azalia Putri Salsabila , Reza Dwi Ramadhan , Alfiyah Nahdah Kamilah , Arma Andi Kusuma , Choirul Anna Nur Afifah , Amalia Ruhana , Satwika Arya Pratama , Galuh Impala Bidari , Ali Imron
221-229
Abstract : 313
PDF : 248

PDF

STUDY OF READINESS FOR IMPLEMENTATION OF INTEGRATED STUNTING REDUCTION INTERVENTIONS IN KLOJEN DISTRICT, MALANG CITY

DOI : 10.20473/mgi.v17i1SP.230-238
Fitria Dhenok Palupi , Indri Hapsari , Ibnu Fajar , Nurul Hakimah , Tapriadi Tapriadi , Juin Hadisuyitno , Siti Rahayu Nadhiroh
230-238

PDF

SINERGI LINTAS SEKTOR DALAM PERCEPATAN PENURUNAN STUNTING DI KABUPATEN NGANJUK, JAWA TIMUR

DOI : 10.20473/mgi.v17i1SP.239-243
Ali Imron , Cleonara Yanuar Dini , Satwika Arya Pratama , Udin Kurniawan Aziz , Siti Mudiyah , Diyah Herowati , Fonny Indri Hartanti
239-243

PDF

The Dual Role of Early Childhood Teachers as Health Cadres in Reducing Stunting

-

DOI : 10.20473/mgi.v17i1SP.244-249
Nurul Hakimah , Siti Rahayu Nadhiroh , Dhorta , Tapriadi , Fitria Dhenok Palupi , Indri Hapsari , Ibnu Fajar , Juin Hadisuyitno
244-249

PDF

IMPLEMENTASI DANA DESA SEBAGAI UPAYA INTERVENSI PENURUNAN STUNTING DESA PANDAN WANGI KECAMATAN DIWEK KABUPATEN JOMBANG

DOI : 10.20473/mgi.v17i1SP.250-256
Agus Raikhani , Luluk Masluchah , Widati Fatmaningrum , Patmawati , Budi Utomo , Sa'idah Zahrotul Jannah
250-256

PDF

KEARIFAN LOKAL DALAM PAWON URIP UNTUK PENCEGAHAN STUNTING DI KABUPATEN LUMAJANG JAWA TIM

DOI : 10.20473/mgi.v17i1SP.257-263

Muhammad Luthfi Abdul Ghaffar , Edi Dwi Riyanto , Siti Rahayu Nadhiroh , Mohammad Zainal Fatah , Ira Nurmala

257-263

MEDIA GIZI Indonesia
p ISSN 1693-7228
e ISSN 2540-8410

Editorial Team

Prof. Dr. Annis Catur Adi, Ir., M.Si
Chief Editor
Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia
-
Annis Catur Adi
57200582013
-

Associate Professor. C.A. Kalpana, M.Sc., Bed., M.Phil., PhD
Editorial Board
Avinashilingam Institute for Home Science and Higher Education for Women, India
-
Prof. C. A .Kalpana
57217200138
-

Assoc. Prof. Wantanee Kriengsinyos, Ph.D
Editorial Board
Human Nutrition Division, Institute of Nutrition, Mahidol University, Thailand
-
-
6506938692
-

Assoc. Prof. Hazreen Bin Abdul Majid, Bsc. Dietetic., M.Nut.Dietetic., Ph.D
Editorial Board
Department Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Malaysia
-
-
54893067500
-

Prof. Dr. Ir. Dodik Briawan, MCN
Editorial Board
Department of Community Nutrition, Human Ecology Faculty, Bogor Agricultural University, Indonesia

-

-

56157628600

-

Prof. R. Bambang W, dr, MS, MCN, Ph.D, SpGK

Editorial Board

epartment of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia

-

-

56403330300

-

Prof. Dr. Luthfiyah Nurlaela, M.Pd

Editorial Board

State University of Surabaya, Indonesia

-

-

57193699945

-

Dr. Beben Benyamin, PhD

Editorial Board

School of Health Sciences, University of South Australia

-

-

16314927500

-

Loh Su Peng, PhD

Editorial Board

Department of Nutrition & Dietetics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia

-

-

23972729900

-

Sueppong Gowachirapant, Ph.D

Editorial Board

Institute of Nutrition, Mahidol University, Thailand

-

-

12764961000

-

Dr. Ir. Tri Dewanti Widyaningsih, M.Kes

Editorial Board

Department of Food Science and Technology, Faculty of Agriculture Technology, University of Brawijaya, Indonesia, Indonesia

-

-

55900709900

-

Dr. Toto Sudargo, M.Kes,

Editorial Board

Undergraduate School of Nutrition and Health, Faculty of Medicine, Gadjah Mada University, Indonesia

-

-

56158010900

-

Prof. Dian Handayani, SKM.,MKes.,Ph.D

Editor Board

Nutrition Department, Faculty of Medicine, University of Brawijaya, Indonesia

-

-

56035896000

-

Qonita Rachmah, S.Gz, M.Sc (Nutr & Diet)

Managing Editors

Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia

-

-

60069383

-

Stefania Widya Setyaningtyas,S.Gz,MPH

Managing Editors

Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia

-

-

57208284644

-

Dominikus Raditya Atmaka, S.Gz., MPH

Managing Editors

Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia

-

-

57222577092

-

Nandia Firsty Dhorta, S.Gz

Administrative Assistant

Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Indonesia.

-

-

-

-

Login

Username *

Password *

Forgot your password?

Keep me logged in

Login Register

Accreditation & Certificate

S2

Download Certificate

Focus and Scope | Publication Ethics

PLAGIARISM SCREENING

The manuscript submitted to our system will be checked using ***Turnitin*** software (<20%).

PUBLICATION ETHICS

National Nutrition Journal is the member of the Committee on Publication Ethics (COPE). As such, this journal follows the COPE Code of Conduct and Best Practice Guidelines for Journal Editors and the Code of Conduct for Journal Publishers.

In addition, as a journal that follows the ICMJE's Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals, it is expected of authors, reviewers and editors that they follow the best-practice guidelines on ethical behavior contained therein.

A selection of key points is included below, but you should always refer to the three documents listed above for full details.

Duties of Editors

Fair play and editorial independence

Editors evaluate submitted manuscripts exclusively on the basis of their academic merit (importance, originality, study's validity, clarity) and its relevance to the journal's scope, without regard to the authors' race, gender, sexual orientation, ethnic origin, citizenship, religious belief, political philosophy or institutional affiliation. Decisions to edit and publish are not determined by the policies of governments or any other agencies outside of the journal itself. The Editor-in-Chief has full authority over the entire editorial content of the journal and the timing of publication of that content.

Confidentiality

Editors and editorial staff will not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

Disclosure and conflicts of interest

Editors and editorial board members will not use unpublished information disclosed in a submitted manuscript for their own research purposes without the authors' explicit written consent. Privileged information or ideas obtained by

editors as a result of handling the manuscript will be kept confidential and not used for their personal advantage. Editors will recuse themselves from considering manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships/connections with any of the authors, companies or institutions connected to the papers; instead, they will ask another member of the editorial board to handle the manuscript.

Publication decisions

The editors ensure that all submitted manuscripts being considered for publication undergo peer-review by at least two reviewers who are expert in the field. The Editor-in-Chief is responsible for deciding which of the manuscripts submitted to the journal will be published, based on the validation of the work in question, its importance to researchers and readers, the reviewers' comments, and such legal requirements as are currently in force regarding libel, copyright infringement and plagiarism. The Editor-in-Chief may confer with other editors or reviewers in making this decision.

Involvement and cooperation in investigations

Editors (in conjunction with the publisher and/or society) will take responsive measures when ethical concerns are raised with regard to a submitted manuscript or published paper. Every reported act of unethical publishing behavior will be looked into, even if it is discovered years after publication. National Nutrition Journal editors follow the COPE Flowcharts when dealing with cases of suspected misconduct. If, on investigation, the ethical concern is well-founded, a correction, retraction, expression of concern or other note as may be relevant, will be published in the journal.

Duties of Reviewers

Contribution to editorial decisions

Peer review assists editors in making editorial decisions and, through editorial communications with authors, may assist authors in improving their manuscripts. Peer review is an essential component of formal scholarly communication and lies at the heart of scientific endeavor. National Nutrition Journal shares the view of many that all scholars who wish to contribute to the scientific process have an obligation to do a fair share of reviewing.

Promptness

Any invited referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should immediately notify the editors and decline the invitation to review so that alternative reviewers can be contacted.

Confidentiality

Any manuscripts received for review are confidential documents and must be treated as such; they must not be shown to or discussed with others except if authorized by the Editor-in-Chief (who would only do so under exceptional and specific circumstances). This applies also to invited reviewers who decline the review invitation.

Standards of objectivity

Reviews should be conducted objectively and observations formulated clearly with supporting arguments so that authors can use them for improving the manuscript. Personal criticism of the authors is inappropriate.

Acknowledgment of sources

Reviewers should identify relevant published work that has not been cited by the authors. Any statement that is an observation, derivation or argument that has been reported in previous publications should be accompanied by the relevant citation. A reviewer should also notify the editors of any substantial similarity or overlap between the manuscript under consideration and any other manuscript (published or unpublished) of which they have personal knowledge.

Disclosure and conflicts of interest

Any invited referee who has conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies or institutions connected to the manuscript and the work described therein should immediately notify the editors to declare their conflicts of interest and decline the invitation to review so that alternative reviewers can be contacted.

Unpublished material disclosed in a submitted manuscript must not be used in a reviewer's own research without the express written consent of the authors. Privileged information or ideas obtained through peer review must be kept confidential and not used for the reviewer's personal advantage. This applies also to invited reviewers who decline the review invitation.

Duties of Authors

Reporting standards

Authors of original research should present an accurate account of the work performed and the results, followed by an objective discussion of the significance of the work. The manuscript should contain sufficient detail and references to permit others to replicate the work. Review articles should be accurate, objective and comprehensive, while editorial 'opinion' or perspective pieces should be clearly identified as such. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable.

Data access and retention

Authors may be asked to provide the raw data of their study together with the manuscript for editorial review and should be prepared to make the data publicly available if practicable. In any event, authors should ensure accessibility of such data to other competent professionals for at least 10 years after publication (preferably via an institutional or subject-based data repository or other data center), provided that the confidentiality of the participants can be protected and legal rights concerning proprietary data do not preclude their release.

Originality and plagiarism

Authors should ensure that they have written and submit only entirely original works, and if they have used the work and/or words of others, that this has been appropriately cited. Publications that have been influential in determining

the nature of the work reported in the manuscript should also be cited. Plagiarism takes many forms, from "passing off" another's paper as the author's own, to copying or paraphrasing substantial parts of another's paper (without attribution), to claiming results from research conducted by others. Plagiarism in all its forms constitutes unethical publishing behavior and is unacceptable.

Multiple, duplicate, redundant or concurrent submission/publication

Papers describing essentially the same research should not be published in more than one journal or primary publication. Hence, authors should not submit for consideration a manuscript that has already been published in another journal. Submission of a manuscript concurrently to more than one journal is unethical publishing behavior and unacceptable.

The publication of some kinds of articles (such as clinical guidelines, translations) in more than one journal is sometimes justifiable, provided that certain conditions are met. The authors and editors of the journals concerned must agree to the secondary publication, which must reflect the same data and interpretation of the primary document. The primary reference must be cited in the secondary publication.

Authorship of the manuscript

Only persons who meet these authorship criteria should be listed as authors in the manuscript as they must be able to take public responsibility for the content: (i) made significant contributions to the conception, design, execution, data acquisition, or analysis/interpretation of the study; and (ii) drafted the manuscript or revised it critically for important intellectual content; and (iii) have seen and approved the final version of the paper and agreed to its submission for publication. All persons who made substantial contributions to the work reported in the manuscript (such as technical help, writing and editing assistance, general support) but who do not meet the criteria for authorship must not be listed as an author, but should be acknowledged in the "Acknowledgments" section after their written permission to be named as been obtained. The corresponding author should ensure that all appropriate coauthors (according to the above definition) and no inappropriate coauthors are included in the author list and verify that all coauthors have seen and approved the final version of the manuscript and agreed to its submission for publication.

Disclosure and conflicts of interest

Authors should—at the earliest stage possible (generally by submitting a disclosure form at the time of submission and including a statement in the manuscript)—disclose any conflicts of interest that might be construed to influence the results or their interpretation in the manuscript. Examples of potential conflicts of interest that should be disclosed include financial ones such as honoraria, educational grants or other funding, participation in speakers' bureaus, membership, employment, consultancies, stock ownership, or other equity interest, and paid expert testimony or patent-licensing arrangements, as well as non-financial ones such as personal or professional relationships, affiliations, knowledge or beliefs in the subject matter or materials discussed in the manuscript. All sources of financial support for the work should be disclosed (including the grant number or other reference number if any).

Acknowledgment of sources

Authors should ensure that they have properly acknowledged the work of others, and should also cite publications that have been influential in determining the nature of the reported work. Information obtained privately (from conversation, correspondence or discussion with third parties) must not be used or reported without explicit, written permission from the source. Authors should not use information obtained in the course of providing confidential services, such as refereeing manuscripts or grant applications, unless they have obtained the explicit written permission of the author(s) of the work involved in these services.

Hazards and human or animal subjects

If the work involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, the authors must clearly identify these in the manuscript. If the work involves the use of animals or human participants, the authors should ensure that all procedures were performed in compliance with relevant laws and institutional guidelines and that the appropriate institutional committee(s) has approved them; the manuscript should contain a statement to this effect. Authors should also include a statement in the manuscript that informed consent was obtained for experimentation with human participants. The privacy rights of human participants must always be observed. The vulnerable require special justification to participate in human subject research in order to eliminate potential human rights abuses.

Peer review

Authors are obliged to participate in the peer review process and cooperate fully by responding promptly to editors' requests for raw data, clarifications, and proof of ethics approval, patient consents and copyright permissions. In the case of a first decision of "revisions necessary", authors should respond to the reviewers' comments systematically, point by point, and in a timely manner, revising and re-submitting their manuscript to the journal by the deadline given.

Fundamental errors in published works

When authors discover significant errors or inaccuracies in their own published work, it is their obligation to promptly notify the journal's editors or publisher and cooperate with them to either correct the paper in the form of an erratum or to retract the paper. If the editors or publisher learns from a third party that a published work contains a significant error or inaccuracy, then it is the authors' obligation to promptly correct or retract the paper or provide evidence to the journal editors of the correctness of the paper.

Duties of the Publisher

Handling of unethical publishing behavior

In cases of alleged or proven scientific misconduct, fraudulent publication or plagiarism, the publisher, in close collaboration with the editors, will take all appropriate measures to clarify the situation and to amend the article in question. This includes the prompt publication of an erratum, clarification or, in the most severe case, the retraction of the affected work. The publisher, together with the editors, shall take reasonable steps to identify and prevent the publication of papers where research misconduct has occurred, and under no circumstances encourage such misconduct or knowingly allow such misconduct to take place.

Access to journal content

The publisher is committed to the permanent availability and preservation of scholarly research and ensures accessibility by partnering with organizations and maintaining our own digital archive.

DOCUMENT TEMPLATE

1. Guideline for Author MGI

1. Pedoman Penulisan Jurnal MGI

2. Template MGI 2018 (en)

2. Template MGI 2018 (id)

3. Cover Letter MGI (en)

3. Cover Letter MGI (id)

4. Title Page MGI (en)

4. Title Page MGI (id)

5. Anonymous Template MGI

5. Tanpa Identitas Template MGI

6. Media Gizi Indonesia Copyright Transfer Agreement

7. Lembar Persetujuan Dosen Pembimbing (khusus mahasiswa UNAIR)

Login

Username *

Password *

Forgot your password?

Keep me logged in

Login Register

https://doi.org/10.20473/mgi.v17i1SP.6–12

PENGANEKARAGAMAN PRODUK LOKAL BERBASIS ISOLAT PROTEIN BASAH IKAN LELE (*CLARIAS SP*) SEBAGAI SUMBER PROTEIN UNTUK MENCEGAH STUNTING

Diversification of local products based on Wet Protein Isolate of Catfish (Clarias Sp) as a protein source to prevent stunting

Patmawati[1*], Wini Trilaksani[2*], Winarti Zahidrudin[2], Widati Fatmaningrum[3], Siti Rahayu Nadhiroh[4]
[1]Department of Marine Affairs, Faculty of Fisheries and Marine Affairs, Airlangga University. Surabaya, 60115, Indonesia
[2]Department of Fishery Products Technology, Faculty of Fisheries and Marine Affairs, Bogor Agricultural University, Bogor, 16680, Indonesia
[3]Departemen Ilmu Kesehatan Masyarakat-Kedokteran Pencegahan, Fakultas Kedokteran, Universitas Airlangga, Surabaya, 60131. Indonesia
[4]Department of Nutrition Science, Faculty of Public Health, Airlangga University, Surabaya, 60115, Indonesia
*E-mail: patmawati@fpk.unair.ac.id

ABSTRAK

Stunting merupakan kondisi gagal tumbuh dan kembang pada anak akibat kekurangan asupan gizi dalam waktu yang cukup lama. Hal ini menjadi ancaman utama dalam mewujudkan sumber daya manusia Indonesia yang berkualitas. Selain itu, faktor penyebab stunting dimasyarakat dapat terlihat dari pemenuhan gizi di masyarakat Indonesia baik di pedesaan maupun perkotaan masih belum mampu memenuhi angka kecukupan gizi yang dianjurkan. Konsumsi protein hewani bangsa Indonesia minimal sebesar 6 kg/kapita/hari. Oleh sebab itu, diperlukan program penganekaragaman pangan untuk memenuhi kebutuhan protein hewani khususnya yang bersumber dari ikan. Salah satu komoditas perikanan budidaya memiliki peluang yang sangat besar untuk dikembangkan dalam rangka pemenuhan gizi masyarakat Indonesia adalah ikan lele. Ikan lele yang bobotnya melebihi ukuran konsumsi (*oversize*) memililiki kendala dalam pemasarannya, sehingga mengakibatkan kerugian pada para pembudidaya. Oleh sebab itu penggunaan lele oversized sebagai bahan untuk pembuatan produk lokal berupa cendol sangat potensial untuk dikembangkan untuk meningkatkan kandungan protein. Penelitian ini bertujuan untuk menentukan formulasi *dessert* (cendol) berbasis isolat protein basah (surimi) ikan lele. Konsentrasi surimi yang digunakan pada penelitian pendahuluan sebesar 0%, 10%, 20%, 30%, 40%, 50% dan 60%. Produk yang dihasilkan kemudian dikaraterisasi baik secra organoleptik, kimia dan biologi. Hasil uji proksimat pada penelitian utama menunjukan bahwa semakin tinggi persentasi surimi yang digunakan semakin tinggi pula kandungan protein pada produk cendol. Hasil uji proksimat cendol komersil, dan cendol berbasis surimi dengan penambahan persentasi surimi 25%, 30%, dan 35% secara berturut-turut sebesar 1,24%, 4,13%, 4,74% dan 5,47%. Selama 8 hari penyimpanan pada suhu 6^{o}C terjadi kemunduran mutu produk yang terlihat dari semua parameter uji pada produk cendol.

Kata kunci: keamanan pangan, lele oversized, produk lokal (cendol), surimi, stunting

ABSTRACT

Stunting is a condition of failure to grow and develop in children due to lack of nutritional intake for a long time. This is a major threat in realizing quality Indonesian human resources. In addition, the factors that cause stunting in the community can be seen from the fulfillment of nutrition in Indonesian society, both in rural and urban areas, which are still not able to meet the recommended nutritional adequacy rate.. The consumption of animal protein in Indonesia is at least 6 kg/capita/day. Therefore, a food diversification program is needed to meet the needs of animal protein, especially those sourced from fish. One of the aquaculture commodities that has a very large opportunity to be developed in the context of fulfilling the nutrition of the Indonesian people is catfish. Catfish whose weight exceeds the size of consumption has problems in marketing, resulting in losses for farmers. Therefore, the use of oversized catfish as an ingredient for the manufacture of local products in the form of cendol has the potential to be developed to increase protein content. This study aims to determine the formulation of a dessert (cendol) based on wet protein isolate (surimi) of catfish. The concentration of surimi used in the preliminary study was 0%, 10%, 20%, 30%, 40%, 50% and 60%. The resulting product is then characterized by organoleptic, chemical, and biological characteristics. The results of the proximate test in the main study showed that the higher the percentage of surimi used, the higher the

 Received 18-11-2022, Accepted 13-12-2022, Published online 15-12-2022.

protein content of cendol products. The results of the commercial cendol proximate test, and surimi-based cendol with the addition of 25%, 30%, and 35% surimi percentages were 1.24%, 4.13%, 4.74% and 5.47%, respectively. During 8 days of storage at 6^{o}C there was a decline in product quality as seen from all test parameters on cendol products.

Keywords: *food security**,** local product (cendol), oversized catfish, Surimi, Stunting*

PENDAHULUAN

Stunting merupakan salah salah satu isu malnutrisi di negara berkembang akibat kekurangan energi protein. Stunting menyebakan dampak pada masa muda dan tua bagi penderitanya (*double burden*). Pada masa muda dapat menurunkan produktivitas dan dimasa tua menimbulkan resiko ada penyakit yang tidak menular (*non-communicable diseases*) (WHO, 2018). Hal ini salah satunya dapat disebkan oleh sumbangan protein ikan terhadap angka kecukupan gizi masyarakat Indonesia baru mencapai 12%, masih sangat rendah dibandingkan dengan Malaysia yang mencapai 18% dari angka kecukupan gizi (Martani 2010), oleh sebab itu, diperlukan program penganekaragaman pangan untuk memenuhi kebutuhan protein hewani khususnya yang bersumber dari ikan.

Penganekaragaman pangan ikani dalam rangka peningkatan konsumsi ikan tertentu harus didukung dengan pengadaan bahan baku. Suplai bahan baku di Indonesia akan melimpah bila budidaya digalakkan. Salah satu komoditas perikanan budidaya yang memiliki peluang untuk dikembangkan dalam rangka pemenuhan gizi masyarakat Indonesia adalah ikan lele.

Perkembangan produksi lele dumbo secara nasional mengalami kenaikan sebesar 18,3% dari tahun 1999 ke tahun 2003. Ukuran ikan lele sangat menentukan nilai jualnya. Ikan lele yang bobotnya melebihi ukuran konsumsi (*oversize*) memililiki kendala dalam pemasarannya, sehingga mengakibatkan kerugian pada para pembudidaya (Trobos 2008). Kandungan lemak yang rendah dan memiliki daging yang putih dapat dijadikan salah satu keunggulan ikan lele sebagai bahan baku dalam pembuatan surimi (Ladewig dan Logan 1992). Suatu upaya diversifikasi untuk meningkatkan nilai ekonomis ikan lele yang berukuran besar yaitu dilakukan pembuatan surimi sebagai bahan baku dalam pembuatan cendol. Penambahan surimi lele dalam pembuatan cendol akan meningkatkan kandungan proteinnya.

Penelitian ini bertujuan untuk menentukan formulasi cendol berbasis surimi ikan lele, melakukan karakterisasi fisik, dan kimia, serta mempelajari pengaruh penyimpanan pada suhu 6 ^{o}C terhadap kemunduran mutu dari produk cendol.

METODE

Penelitian dilaksanakan di Laboratorium Pengolahan Hasil Perairan, Laboratorium Organoleptik, Laboratorium mikrobiologi dan Biokimia Hasil Perairan, dan Laboratorium Biokimia Pangan dan Gizi Fakultas Teknologi Pertanian, Institut Pertanian Bogor.

Bahan-bahan yang digunakan untuk penelitian yaitu ikan lele (*Clarias* sp), santan, tepung tapioka, rumput laut *Euchema cottonii* dan daun suji (*Pleomale angustifolia*). Bahan yang digunakan untuk analisis yaitu K_2SO_4, HgO, H_2SO_4, aquades, NaOH 40%, H_3BO_3, alkohol, metil biru, metil merah, heksana, tablet kjeldahl, *nutrient agar* (NA), *thiobarbhituric acid* dan HCl . Alat-alat yang digunakan dalam penelitian yaitu cawan, *hot plate*, kertas saring, kondensor, labu lemak, kjeldahl, erlemeyer, *wearing blender*, pipet, tabung reaksi, vortex, oven, cawan porselin, desikator, dan soxhlet.

Penelitian ini dibagi menjadi 2 tahap, yaitu penelitian pendahuluan dan penelitian utama. Penelitian pendahuluan dilakukan untuk mengetahui rendemen ikan lele yang dibandingkan dengan penelitian Nurimala *et al.* (2009) yang menunjukan bahwa semakin besar ukuran ikan lele rendeman dagingnya semakin besar. Pada tahap penelitian pendahuluan dilakukan uji proksimat bahan baku, uji organoleptik produk cendol, yang dilanjutkan dengan uji Bayes untuk mendapatkan nilai konsentrasi surimi terbaik yang dapat diterima oleh panelis. Penelitian utama dilakukan untuk mengetahui nilai gizi dari produk melalui uji proksimat, dan untuk mempelajari pengaruh

penyimpanan produk dilakukan uji secara subjektif (organoleptik) dan uji objektif (TBA, TPC, dan proksimat). Uji organoleptik, uji TBA dan uji TPC dilakukan pada 3 titik yaitu hari ke-0, 4 dan 8. Uji proksimat (kadar air, abu, lemak, dan protein) dilakukan pada hari ke-0 dan ke-8. Perlakuan yang diberikan terhadap produk cendol yang diujikan berupa konsentrasi surimi yang berbeda-beda bervariasi antara 25%, 30%, dan 35%. Cendol disimpan selama 8 hari pada suhu 6 ^{o}C, karena berdasarkan hasil *desk study* dan percobaan (*trial an eror)* cendol sudah tidak layak dikonsumsi yang ditandai dengan adanya kemunduran mutu secara sensorik sedangkan untuk komersial cendol bertahan 4 hari pada suhu refrigator.

HASIL DAN PEMBAHASAN

Uji hedonik

Berdasarkan hasil uji hedonik penampakan menunjukkan bahwa nilai penampakan cendol berbasis surimi dengan konsentrasi 0-60% berkisar antara 4,07 sampai 5,93 dari skala hedonik 1-9 (Gambar 1). Nilai penampakan cendol tertinggi yaitu pada perlakuan penambahan konsentrasi surimi 60% dan nilai terendah pada penambahan konsentrasi surimi 0%. Hasil uji *Chi-Square* menunjukkan bahwa penambahan konsentrasi surimi yang berbeda memberikan pengaruh yang berbeda terhadap penampakan produk cendol. Semakin tinggi surimi yang ditambahkan penampakan cendol semakin baik, cendol saling terpisah satu sama lain, tekstur kenyal, elastis, utuh, dan padat. Semakin rendah konsentrasi surimi yang ditambahkan tekstur cendol semakin lembek seperti bubur. Perbandingan yang tepat dari bahan adonan akan mempengaruhi penampakan produk.

Hasil uji hedonik warna (aroma) menunjukkan bahwa nilai aroma cendol berbasis surimi dengan konsentrasi 0-60% berkisar antara 5,4 sampai 6,4 dari skala hedonik 1-9 (Gambar 2). Nilai aroma cendol tertinggi yaitu pada perlakuan penambahan konsentrasi surimi 30% dan nilai terendah pada penambahan konsentrasi surimi 60%. Hasil uji *Chi-Square* menunjukkan bahwa penambahan konsentrasi surimi yang berbeda tidak memberikan pengaruh yang berbeda terhadap aroma produk cendol. Aroma amis pada surimi telah direduksi melalui proses pencucian sehingga aroma yang timbul pada produk cendol lebih didominasi aroma khas daun suji dan santan yang ditambahkan pada adonan. Faktor-faktor yang mempengaruhi aroma produk cendol yaitu aroma daun suji dan aroma santan. Menurut Charles dan Mankoo (2005) menyatakan persepsi aroma amis akan menurun ketika minyak nabati digunakan, karena minyak nabati akan menurunkan tekanan uap air dari berbagai komponen rasa.

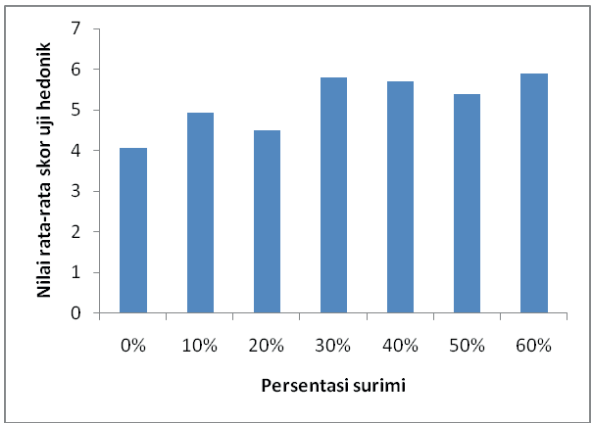
Hasil uji kesukaan (hedonik) rasa menunjukkan bahwa nilai rasa cendol berbasis surimi dengan konsentrasi 0-60% berkisar antara 4,73 sampai 6,27 dari skala hedonik 1-9 (Gambar 3). Hasil uji *Chi-Square* menunjukkan bahwa penambahan konsentrasi surimi yang berbeda memberikan pengaruh yang berbeda nyata terhadap rasa produk cendol. Semakin tinggi konsentrasi surimi yang ditambahkan pada adonan semakin meningkatkan rasa amis dan asin dari cendol, hal ini terjadi karena semakin tinggi konsentrasi surimi yang ditambahkan, maka rasa amis makin terasa. Perlakuan penambahan konsentrasi surimi 60%, panelis mulai tidak menyukai rasa produk. Menurut Charles dan Mankoo (2005) garam digunakan sebagai penyedap rasa. Namun dalam konsentrasi yang tinggi akan memperburuk rasa produk.

Hasil uji kesukaan (hedonik) warna menunjukkan bahwa nilai warna cendol berbasis surimi dengan konsentrasi 0-60% berkisar antara 3,9 sampai 6,43 skala hedonik 1-9 (Gambar 4). Nilai warna cendol tertinggi yaitu pada perlakuan penambahan konsentrasi surimi 0% dan 10% dan nilai terendah pada penambahan konsentrasi surimi 50%. Hasil uji *Chi-Square* menunjukkan bahwa penambahan konsentrasi surimi yang berbeda memberikan pengaruh yang berbeda terhadap warna produk cendol. Semakin tinggi konsentrasi surimi yang ditambahkan semakin menurun tingkat kepekatan warna produk cendol. Warna yang timbul pada produk cendol berasal dari ekstrak daun suji. Daun suji memiliki pigmen klorofil yang berwarna hijau.

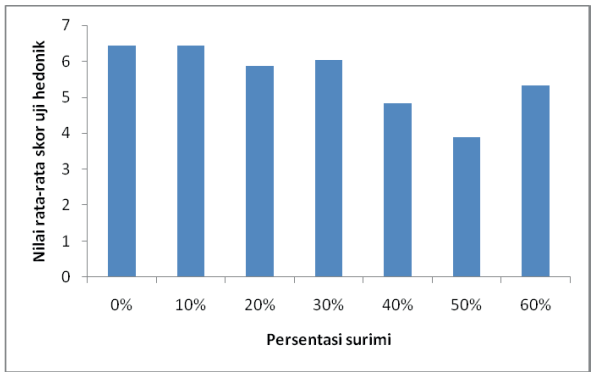
Hasil uji kesukaan (hedonik) tekstur menunjukkan bahwa nilai tekstur cendol berbasis surimi dengan konsentrasi 0-60% berkisar antara 4,50 sampai 6,13 dari skala hedonik 1-9 (Gambar 5). Nilai tekstur cendol tertinggi

yaitu pada perlakuan penambahan konsentrasi surimi 60% dan nilai terendah pada penambahan konsentrasi surimi 20%. Hasil uji *Chi-square* menunjukkan bahwa penggunaan surimi dengan berbagai konsentrasi memberikan pengaruh yang berbeda terhadap tekstur produk cendol. Semakin tinggi konsentrasi surimi yang ditambahkan menyebabkan tekstur produk menjadi kenyal, elastis dan padat. Kombinasi bahan yang tepat antara surimi, tepung tapioka, santan, rumput laut akan menghasilkan tekstur yang tepat. Santan sebagai lemak nabati membentuk tekstur cendol menjadi lebih lembut. Semakin tinggi konsentrasi surimi yang ditambahkan menyebabkan cendol menjadi padat dan tingkat kelembutan teksturnya menurun.

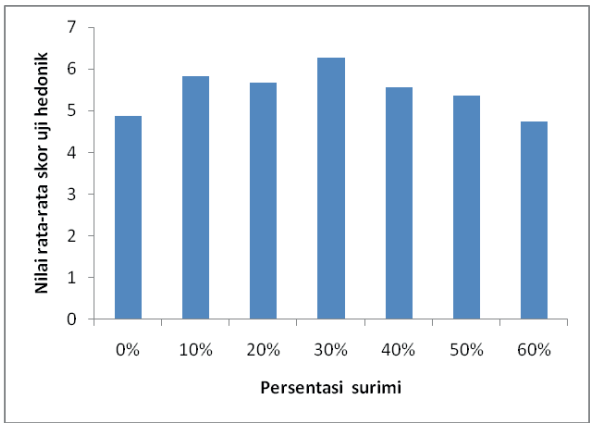
Hasil analisis menggunakan metode Bayes berdasarkan uji hedonik, menunjukkan bahwa cendol dengan formulasi penggunaan bahan baku surimi 30% mendapatkan nilai tertinggi sebesar 6,05.



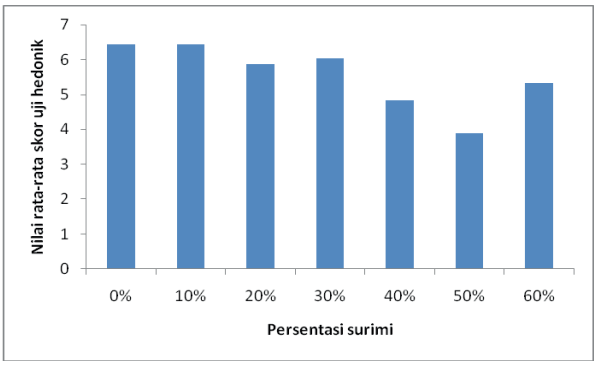
Gambar 1. asil uji penampakan cendol berbasis surimi ikan lele



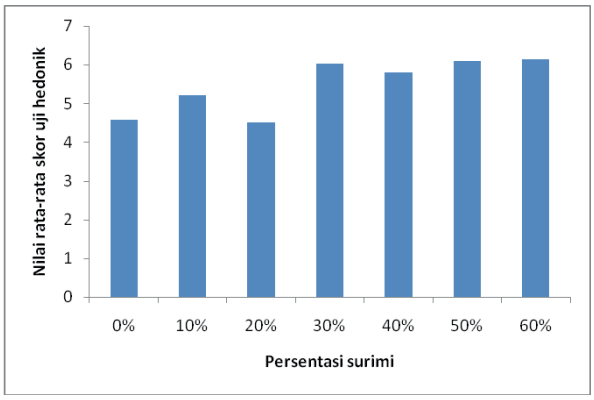
Gambar 2. hasil uji bau cendol berbasis surimi iken lele



Gambar 3. Hasil uji rasa cendol berbasis surimi ikan lele



Gambar 4. Hasil uji warna cendol berbasis surimi iken lele



Gambar 5. Hasil uji tekstur cendol berbasis surimi ikan lele

Analisis Proksimat

Hasil uji F kadar air menunjukkan bahwa kadar air dari cendol dengan penggunaan surimi 30% memberikan pengaruh yang berbeda apabila dibandingkan dengan penggunaan surimi 25%, 35% dan cendol komersial (Tabel 1). Perbedaan kadar air pada produk cendol komersial dan cendol

Tabel 1. Komposisi gizi cendol berbasis surimi

	Komersial	Surimi 25%	surimi 30%	surimi 35%
Kadar abu	0.19±0.00	0.58±0.02	0.69±0.12	0.68±0.11
Kadar protein	1.24±0.11	4.13±0.17	4.74±0.04	5.47±0.26
Kadar lemak	0.76±0.00	1.35±0.01	1.36±0.01	2.15±0.01
Kadar air	91.10±0.28	71.79±0.28	69.73±0.87	72.34±0.37
Kadar karbohidrat (*by difference*)	6.72±0.18	22.16±0.15	23.49±0.78	19.37±0.53

berbasis surimi dipengaruhi oleh proses pemasakan dan bahan yang digunakan. Cendol komersial mempunyai nilai kadar air tertinggi disebabkan oleh pada saat proses pembuatan bahan yang digunakan sebagian besar mengandung air, dan bahan padat yang digunakan hanya tepung beras saja. Selama proses penyimpanan kadar air semua produk yang diujikan mengalami penurunan, hal ini diduga pada saat disimpan pada suhu 6 ^{o}C kadar air dalam bahan teruapkan dalam sistem refrigasi. Menurut Bao *et al.* (2007), sistem refrigasi memiliki kelembaban yang lebih rendah dibandingkan dengan bahan pangan, sehingga akan terjadi aliran uap air dari bahan pangan ke lingkungan.

Hasil analisis kadar protein menunjukkan semakin tinggi jumlah surimi yang ditambahkan semakin tinggi kadar protein yang disumbangkan dari produk cendol. Penggunaan konsentrasi surimi yang berbeda-beda pada formulasi cendol berbasis surimi memberikan pengaruh yang berbeda terhadap protein cendol. Kadar protein cendol berbasis surimi setelah penyimpanan mengalami penurunan, hal ini diduga disebabkan telah terjadi perubahan mutu protein pada produk cendol. Menurut Daramola *et al.* (2007), degradasi protein kasar terjadi secara berangsur-angsur menghasilkan asam amino, dengan produk lanjutan berupa komponen volatil seperti *total*

volatile bases (TVB), H_2S dan ammonia. Perubahan komponen protein dan lemak selama penyimpanan disebabkan adanya pelepasan fraksi protein terlarut dan terjadi hidrolisis beberapa fraksi lemak.

Hasil uji proksimat kadar lemak menunjukkan bahwa penggunaan konsentrasi surimi yang berbeda-beda pada formulasi cendol berbasis surimi memberikan pengaruh yang berbeda terhadap kadar lemak cendol. Semakin tinggi penambahan konsentrasi surimi maka kadar lemaknya semakin meningkat, hal ini diduga, bahwa lemak selain berasal dari surimi, juga berasal dari santan yang ditambahkan pada adonan. Kadar lemak produk cendol setelah dilakukan penyimpanan selama 8 hari mengalami penurunan, berdasarkan hal tersebut diduga telah terjadi kerusakan bahan pangan. Daramola *et al.* (2007) menyatakan penurunan kadar lemak merupakan indikator terjadinya oksidasi dari *poly unsaturated fatty acids* (PUFA) yang berada pada produk dan menghasilkan komponen peroksida, aldehid, keton, dan asam lemak bebas.

Sarma *et al.* (2000) menyatakan bahwa adanya kandungan lemak pada bahan pangan yang bereaksi dengan oksigen dapat menyebakan ketengikan. Perubahan mutu lemak yang terjadi pada produk cendol disebabkan oleh adanya oksdasi lemak. Oksidasi lemak terjadi akibat bahan pangan (cendol) yang mengandung lemak bersentuhan dengan udara yang merembes melalui pori-pori plastik (Lund *et al*. 2007; Diaz *et al.* 2010). Proses oksidasi produk cendol juga dapat disebabkan oleh adanya mikroorganisme pada cendol. Bakteri dapat merusak bahan pangan dengan cara menghidrolisis atau mendegradasi makromolekul yang menyusun bahan tersebut menjadi fraksi yang lebih kecil, seperti lemak dengan adanya bakteri akan terpecah menjadi gliserol dan asam-asam lemak (Suvanich *et al.* 2000). Hidrolisis lemak dapat menyebabkan ketengikan pada produk cendol.

Hasil uji F kadar abu menunjukkan perlakuan penggunaan surimi tidak memberikan pengaruh yang berbeda terhadap kadar abu. Berdasarkan hasil uji proksimat bahan baku, kadar abu surimi telah mengalami penurunan akibat proses pencucian. Selama proses penyimpanan perubahan kadar abu relatif kecil.

Berdasarkan hasil uji F terhadap kandungan karbohidrat, penggunaan konsentrasi surimi yang berbeda-beda pada formulasi cendol berbasis

surimi memberikan pengaruh yang berbeda terhadap karbohidrat produk cendol. Kadar karbohidrat diperoleh berdasarkan pehitungan *by difference.* Komposisi bahan makanan tergantung dari komponen yang paling tinggi penyusun bahan makanan tersebut yaitu kadar air. Jin *et al.* (2009) menyatakan bahwa semakin tinggi nilai kadar air dalam komponen bahan pangan maka nilai komponen yang lainnya semakin rendah (termasuk karbohidrat).

Uji organoleptik selama penyimpanan

Hasil uji organoleptik selama penyimpanan pada suhu ± 6 ^{o}C menunjukkan penurunan kemunduran mutu dari produk cendol dari semua perlakuan. Go *et al.* (2009) menyatakan bahwa kerusakan bahan pangan dapat disebabkan oleh faktor-faktor sebagai berikut pertumbuhan dan aktivitas mikroba terutama bakteri, aktivitas enzim pada bahan pangan, suhu, termasuk suhu pemanasan dan pendinginan, kadar air, udara terutama oksigen, sinar dan jangka waktu penyimpanan. Kemunduran mutu secara organoleptik dapat diamati dengan terbentuknnya bau yang kurang sedap dan warnanya semakin memudar. Diaz *et al.* (2008) menyatakan bahwa produk daging yang disimpan pada suhu refrigator, setelah penyimpanan 10 hari terjadi penurunan daya penerimaan dari panelis yang ditandai dengan adanya bau yang kurang enak seperti bau tengik.

Analisis bilangan *Thiobarbituric Acid* (TBA) selama penyimpanan produk cendol dilakukan pada hari ke-0, 4 dan 8. Penilaian ini bertujuan untuk mengetahui ketengikan yang terjadi pada produk cendol. Hasil analisis TBA produk cendol selama penyimpanan mengalami peningkatan. Cendol berbasis surimi mempunyai nilai TBA relatif lebih tinggi dibandingkan cendol komersial. Nilai TBA meningkat seiring dengan lamanya penyimpanan. Menurut Park *et al.* (2007) dan Gray *et al.* (1986) suhu penyimpanan merupakan faktor yang sangat penting dalam proses oksidasi. Bilangan TBA akan meningkat dengan meningkatnya lama dan suhu penyimpanan.

Hasil pengukuran TBA hari ke-8 produk cendol komersial, cendol dengan konsentrasi surimi 25%, 30% dan 35% secara berturut-turut sebagai berikut 0,0029, 0,1061, 0,1515, 0,3148 mg malonaldehid/kg bahan. Jhon *et al.* (2004) menyatakan bahwa produk yang masih berkualitas baik memiliki nilai TBA kurang dari 2 mg malonaldehid/kg sampel, hal ini menunjukkan bahwa produk cendol berbasis surimi yang disimpan selama 8 pada suhu ± 6^{o}C masih memiliki kualitas yang baik.

Uji mikrobiologi *Total Plate Count* (TPC) selama penyimpanan dilakukan pada hari ke-0, 4 dan 8. Kandungan TPC dalam produk cendol merupakan salah satu parameter mikrobiologis untuk melihat tingkat kemunduran mutu produk dan tingkat kelayakannya untuk dikonsumsi. Hasil uji TPC hari ke-8 menunjukkan bahwa nilai TPC produk komersial mencapai $2{,}1x10^{8}$ koloni/g, sedangkan cendol berbasis surimi dengan penggunaan surimi 25%, 30% dan 35% secara berturut-turut mencapai $2{,}4x10^{3}$ koloni/g, $2{,}5x10^{3}$, dan $1{,}4x10^{4}$ koloni/g. Hasil penelitian menunjukkan bahwa cendol komersial sudah memiliki nilai bakteri yang melebihi ambang batas makanan yang aman dikonsumsi, sedang cendol berbasis surimi masih aman untuk dikonsumsi. *International Commission on Microbiological Spesification for Foods* (ICMSF) (1986) menyatakan bahwa batas atas mikrobiologi produk makanan nilai TVC tidak boleh lebih dari 7 log cfu/gram.

Nilai gizi produk cendol berbasis surimi

Semakin tinggi penambahan surimi pada cendol, menyebabkan peningkatan total energi yang disumbangkan per penyajian. Hasil perhitungan angka kecukupan gizi pada produk dengan penambahan surimi 30% menyumbangkan persentase angka kecukupan gizi (AKG) karbohidrat, protein dan lemak secara berturut-turut 9%, 5%, dan 2%. Total energi yang disumbangkan sebesar 74,724 kkal dengan *serving size* 100 gram. Protein yang disumbangkan produk cendol sebesar 2,5 g/*serving size.* Jika target konsumsi ikan KKP sebesar 30,17 kg/kapita perhari maka % AKG protein ikan sebesar 12% dan jika target konsumsi protein hewani sebesar 150 g/kapita/hari maka % AKG protein hewani sebesar 22% (Martani 2010). Berdasarkan hal tersebut, maka produk cendol dengan penambahan surimi 30% dapat menyumbangkan asupan protein hewani sebesar 22,73% per *serving size* (100 g).

KESIMPULAN DAN SARAN

Penggunaan surimi pada cendol dengan konsentrasi 30% menghasilkan nilai terbaik berdasarkan hasil uji hedonik yang dilanjutkan dengan uji Bayes. Cendol komersial mempunyai umur simpan relatif lebih singkat dibandingkan dengan cendol berbasis surimi. Cendol berbasis surimi ikan lele pada penyimpanan hari ke-8 masih memiliki kondisi yang baik untuk dikonsumsi.

ACKNOWLEDGEMENT

Penulis berterima kasih atas dana publikasi yang diberikan oleh KEDAIREKA deengan No SK 1526/UN3/2022 dengan ketua Peneliti Dr. Siti Rahayu Nadhiroh.

DAFTAR PUSTAKA

Bao HND., Arason S., Dorarinsdottir KA. 2007. Effects of dry ice and superchilling on quality and shelf life of arctic charr (*Salvelinus alpinus*) fillets. *Journal of Food Engineering* 3(7): 1-29.

Charles M., Mankoo A. 2005. Surimi seafood flavor. Dalam: Park JW (2nd eds). Surimi and Surimi Seafood. Taylor dan Francis Group: CRC press.

Daramola JA., Fasakin EA., Adeparusi EO. 2007. Changes in physicochemical and sensory characteristics of smoke-dried fish species stored at ambient temperature. *African Journal of Food agriculture Nutrition and Development* 7(6): 13-23.

Dıaz P., Nieto G., Garrido MG., Banon S. 2008. Microbial, physical chemical and sensory spoilage during the refrigerated storage of cooked pork loin processed by the sous vide method. *Journal Meat Science* 80: 287–292.

Diaz P., Garrido MD., Bañón S. 2010. The effects of packaging method (vacuum pouch vs. plastic tray) on spoilage in a cook-chill pork-based dish kept under refrigeration. *Journal Meat Science* 84: 538–544.

Go O., Lokuruka MNI., Matofari JW. 2009. Nutritional composition and shelflife of the lake victoria nile perch (*lates niloticus*) stored in ice. *African Journal of Food agriculture Nutrition and Development* 9 (3): 1-19.

Gray JI., Gomaaa EA., Buckley DJ. Oxidative quality and shelf life of meats. *Journal of meat science* 43: 111-123.

[ICMSF] International Commission on Microbiological Spesification for Foods. 1986. Sampling plans for fish and shellfish. Di dalam: Microorganism in foods. Canada: University of Toronto Press 2: 181-196.

Jhon LD., Cornforth, Carpenter CE., Sorhem O., Peetee BC., Whittier DR. 2004. Comparison of color and thiobarbituric acid values of cooked hamburger patties after storages of fresh beef chub in modified atmosphere. *Journal Food and Science* 69: 608-614.

Jin SK., Kim IS., Choi YJ., Kim BG., Hur SJ. 2009. The development of imitation crab stick containing chicken breast surimi. *Journal Food Science and Technology* 42: 150–156.

Ladewig KF., Logan DW. 1992. You can do catfish. *Journal Texas Agricultural Extension Service* 3: 1-6.

Lund MN., Hviid MS., Skibsted LS. 2007. The combined effect of antioxidants and modified atmosphere packaging on protein and lipid oxidation in beef patties during chill storage. *Journal Meat Science* 76: 226–233.

Martani H. 2010. Tantangan dalam Mengelola Secara Berkesinambungan Perikanan Indonesia. Jakarta: Kelompok Diskusi Sore Hari-LPEM.

Nurilmala M., Nurjanah., Utama RH. 2009. Kemunduran mutu ikan lele dumbo (*clarias gariepinus*) pada penyimpanan suhu *chilling* dengan perlakuan cara mati. *Jurnal Pengolahan Hasil Perikanan Indonesia* 12(1): 1-16.

Park SY., Yoo SS., Uh JH., Eun JB., Lee HC., Chin, kim an YJ., Chin KB. 2007. Evaluation of lifid oxidation and oxidative product as affectide by pork meat cut, packaging method and storage time during frozen storage(-10°C). *Journal Food Science* 72(2): 114-119.

Sarma J., Reddy GVS., Srikar LN. 2000. Efect of frozen storage on lipids and functional properties of proteins of dressed Indian oil sardine (Sardinella longiceps). *Food Research International* 33: 815-820.

Suvanich V., Marshall DL., Jahncke ML. 2000. Microbiological and color quality changes of channel catfish frame mince during chilled and frozen storage. *Journal Food Engineering and Physical Properties* 65(1): 151-154.

Trobos. 2008. Fillet Lele: Membalik Nasib Lele Bapukan. http://www.trobos.com. [20 Januari 2010

WHO [World Health Organization]. 2018. Global Nutrition Report: shining a light to spur action in nutrition.https://apps.who.int/nutrition/globalnutritionreport. [13 November 2022].