Effect of Yeast Concentration and Moromi Fermentation During toward The Characteristics of Sorghum Grain Sweet Soy Sauce

by Wisnu Cahyadi -

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FANRes 2022 7TH

International Conference on Food, Agriculture, and Natural Resource

ABSTRACK BOOK

The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes) 2022

Blended Conference, Faculty of Food Technology and Agroindustry, University of Mataram

Lombok, Indonesia, November 24th-25th 2022

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ABSTRACK BOOK

The 7th International Conference on Food, Agriculture, and Natural Resources
(IC-FANRes) 2022

Blended Conference, Faculty of Food Technology and Agroindustry, University of Mataram

Merumatta Senggigi Lombok

Lombok, West Nusa Tenggara, Indonesia

24th-25th November 2022

Organized by:

Faculty of Food Technology and
Agroindustry, University of Mataram

WELCOMING SPEECH OF THE DEAN

FACULTY OF FOOD TECHNOLOGY AND AGROINDUSTRY

(7TH IC FANRES 2022)

Assalamu'alaikum warahmatullah wabarakatuh, Good morning, ladies and gentlemen. All Praises to God almighty for giving us the health and opportunity so that we all can meet here today on this special occasion. It is my pleasure to welcome all the participants today for this conference on "The 7th International Conference Food Agriculture and Natural Resources".

The theme of this conference is "Optimizing Innovation on Local Agriculture and Natural Resources to Achieve Food Security and Halal Food Tourism." The objectives of this conference are (1) to Provide a forum for presentations and discussions for researchers or related stakeholders regarding the latest developments in the food sector and natural resource management in realizing food security, (2) to Provide a publication platform for researchers to publish the results of their latest research, and also, as a forum for tourism promotion and regional introduction to the national and international community.

This conference will be held for two days from 23-24 November 2022. We do hope through this conference, new collaborations will be established globally to increase the quality and quantity of our research and scientific publication. It has significant impact to support international academic atmosphere, in line with our institution vision.
I welcome all the eminent keynote speakers, invited speakers as well as the presenters and participants from all over the country from different walks of life.
Deep appreciation to the rector of University of Mataram for being the great support of this conference. We are also grateful for the hard work of the committee behind the scenes and everyone else who contributed to make this conference happen.

Have an enjoyable conference.
Wassalamu;alaikum warohmatullahi wabarakatuh

Dean

Baiq Rien Handayani, SP. MSi. PhD
Dean of Faculty of Food Technology and Agroindustry
University of Mataram

WELCOME MESSAGE FROM CHIEF EXECUTIVE OF THE 7TH INTERNATIONAL CONFERENCE ON FOOD, AGRICULTURE, AND NATURAL RESOURCES (IC-FANRes) 2022

The 7th FANRes 2022 conference is a forum for gathering ideas from thinkers that can be in the form of pure and applied thoughts. Several researchers who will disseminate their research results come from various well-known national and international universities.

In an increasingly advanced era, science and technology have a significant role and are able to facilitate the activities of various sectors, especially agriculture and tourism. One program that can play an important role for the community and industry is realizing food security and halal food tourism.

This is very important because they must always be aware of food crises and provide safe, quality and halal food for local and foreign tourists who are supported by efforts to advance food defense and the economy.

For this reason, I hope that researchers can continue to provide support through research results and implementation through community empowerment.

The committee would also like to thank all those who have supported and actively participated in the success of this international conference.

This is a great opportunity to share experiences and knowledge, and to help strengthen collaboration between campuses. Once again on behalf of the organizers of this conference, I welcome you. Nice to meet you all here.

Sincerely,

Rahmat Sabani, S.TP., MP.

Chief Executive of The 7th FANRes 2022

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CONFERENCE INFORMATION

Date	:	November, 24th (Thursday) – 25th (Friday) 2022
Organizer	:	Faculty of Food Technology and Agroindustry, University of Mataram
Venue	:	Merumatta Senggigi Lombok, Jl. Senggigi Beach, Senggigi, Batu Layar District, West Lombok Regency, West Nusa Tenggara, 83355, Indonesia Phone : +62 370 693211 Email : hello.merumatta@merumattasenggigi.com Web : www. meruhotels.com
Office Language	:	English
Secretariat	:	Faculty of Food Technology and Agroindustry, University of Mataram Jalan Majapahit 62 Mataram, 83125 Phone : + 62 370 649 879 Email : fatepa@unram.ac.id Web : www.fatepa.unram.ac.id
Conference Website	:	www.fanres.fatepa.unram.ac.id

COMMITTEES

Person Responsible

- Baiq Rien Handayani, SP., M.Si., Ph.D

Event Directors

- Ir. Zainuri, PGDip., M.App.Sc.,Ph.D
- Dr. Eng. Sukmawaty, S.T.P., M.Si
- Ir. Ahmad Alamsyah, MP
- Dr. Ir. Satrijo Saloko, MP
- Murad, S.P., MP

Scientific Committee

- Prof. Ir. Eko Basuki., M.App.Sc.,Ph.D
- Prof. Ir. Widyastuti, M.App.Sc.,Ph.D

Chief Executive

- Rahmat Sabani, S.TP., MP

Secretary

- Qabul Dinanta Utama, S.TP., M.Si

Treasurer

- Mutia Devi Ariyana, S.Si., MP
- Made Gendis Putri Pertiwi, S.Si., M.Sc.
- Ana Aini Mariana, SE

Event/IT Division

- Dewa Nyoman Adi Paramartha, S.T.P., M.Si
- Gagassage Nanaluih De Side, S.T., M.T
- Fuad Sauqi Isnain, S.TP., M.T.P., M.Sc.
- Moegiratul Amaro, S.T.P., M.P., M.Sc
- Mi'raj Fuadi, S.T.P., M.Sc.
- Al Gazali Isra Atmanegara, ST
- Raning Dini Hariyanti
- Zulfiana Jayanti

Presentation and Publication Papers

- Dr. Ansar, S.Pd., M.P., M.Pd.
- Dr. Joko Sumarsono, S.T.P., MP
- Dr. Kurniawan Yuniarto, S.T.P., MP
- Ir. I Wayan Sweca Yasa, M.Si
- Ida Ayu Widhiantari, STP., MP

- Ines Marisya Dwi Anggraini, S.Si., M.Biotech
- Lalu Unsunnidhal, S.Pt., M.Biotech.

Secretarial Registration & Lo Divisions

- Sisca Cicilia, S.T.P., M.Sc
- Muh. Ridwan Amin, S.Kom
- Tri Isti Rahayu, S.T.P., M.Sc
- Firman Fajar
- Irmayani Marzuka
- Basri

Sponsorship

- Ir. Nazaruddin, MP.
- Rosyid Ridho, S.T.P., M.Si.,MM
- Oki Saputra, S.S.T., M.Eng.
- Fakhrul Irfan Khalil, S.T.P., M.Si
- M. Faisal Jailani Syafi'i

Equipment Division

- I Ketut Suadnyana
- Amuddin, S.T.P., M.Si
- Muhdin, SP
- Syamsuddin
- I Gede Aditya Prajatama
- Lalu Heri Ulfi

Consumption Divisions

- Rini Nofrida, S.T.P., M.Si
- Isnaini Puspitasari, S.T.P., MT
- Lingga Gita Dwikasari, S.Si.,M.Sc
- Novia Rahayu, S.TP., M.Sc
- Nur Hikmawati
- Dindari Bela Qur'ani

SCOPE OF THE CONFERENCE

Topic of interest includes, but are not restricted to:

- Agricultural
- Natural Resources
- Food Safety
- Food Security
- Food Technology
- Smart Agricultural System
- Biosystem Machinery Engineering
- Food Nutrition & Health

VENUE MAP

Merumatta Senggigi Lombok,

Jl. Senggigi Beach, Senggigi, Batu Layar District, West Lombok Regency, West Nusa Tenggara, 83355, Indonesia

Phone : +62 370 693211

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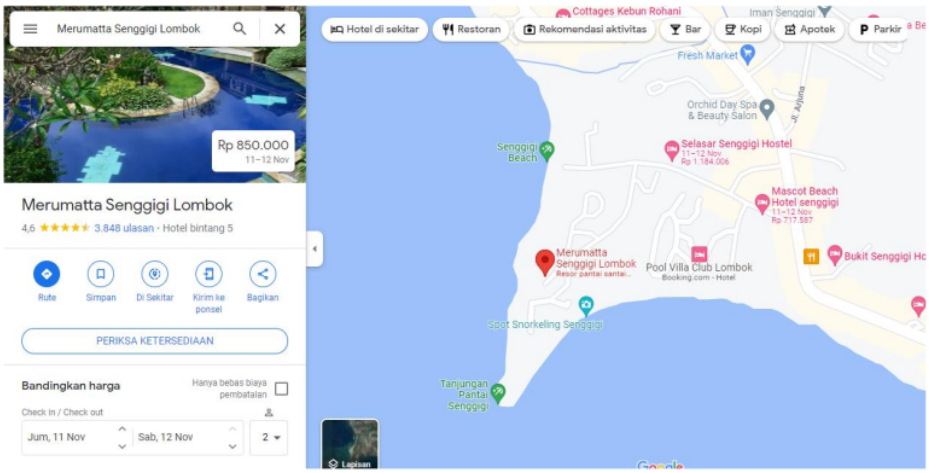

SCAN HERE

Google Maps Link
https://bit.ly/7FANRESVenueMap

GENERAL RUNDOWN
The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes)
November 24-25, 2022. Hotel Merumatta Senggigi Lombok

Thursday, November 24th, 2022				
Time		Duration (minutes)	Activity	Location
Start	Over			
08.00	08.30	30	Registration	Ballroom
08.30	08.35	5	Opening by MC	Ballroom
08.35	08.40	5	Singing national anthem "Indonesia Raya"	Ballroom
08.40	08.55	15	Traditional Performance	Ballroom
08.55	09.00	5	Welcome speech from chairman of committee IC-FANRes 2022	Ballroom
09.00	09.05	5	Welcome speech from Dean of Faculty of Food Technology and Agroindustry	Ballroom
09.05	09.15	10	Welcome Speech from President of FANRes Prof. Yuli Witono	Ballroom
09.15	09.25	10	Welcome Speech from Governor of West Nusa Tenggara Dr. H. Zulkieflimansyah, S.E., M.Sc	Ballroom
09.25	09.35	10	Welcome Speech from Chancellor, University of Mataram Prof. Ir. Bambang Hari Kusumo, M.Agr.St., Ph.D	Ballroom
09.35	09.40	5	Doa	Ballroom
09.40	09.45	5	Group Photo	Ballroom
09.45	10.00	15	Coffee break	Ballroom
10.00	10.30	30	Keynote 1: Prof. Shinjiro Ogita (Prefectural University of Hiroshima, Japan)	Ballroom
10.30	11.00	30	Keynote 2:	

Thursday, November 24th, 2022				
Time		Duration (minutes)	Activity	Location
Start	Over			
			Prof. Patricia Rayes-Duarte (Oklahoma State University, USA)	
11.00	11.30	30	Keynote 3: Prof. Julian Heyes (Massey University, New Zealand)	Ballroom
11.30	12.00	30	Keynote 4: Dr. Ir. Bambang Supriyanto, M.Sc.	Ballroom
12.00	12.30	30	Discussion	
12.30	13.30	60	Break	
13.30	14.00	30	Keynote 5: Dr. Zulhamsyah Imran (IPB University/SEAMEO BIOTROP, Indonesia)	Ballroom
14.00	14.30	30	Keynote 6: Prof. Byuong-Kwan Cho (Chungnam National University, South Korea)	Ballroom
14.30	14.45	15	Coffee break	Ballroom
14.45	15.15	30	Keynote 7 : Yu-Kuo Chen, Ph.D. (National Pingtung University of Science and Technology, Taiwan)	Ballroom
15.15	15.45	30	Discussion	Ballroom
15.45	16.00	15	Closing by MC	Ballroom

Friday, November 25th, 2022				
Time		Duration (minutes)	Activity	Location
Start	Over			
08.00	08.30	30	Registration	In Front of Parallel Room
08.30	08.50	20	Invited Speaker 1	Parallel Room
08.50	09.10	20	Invited Speaker 2	Parallel Room
09.10	10.00	50	Parallel Session	Parallel Room
10.00	10.15	15	Coffee Break	In Front of Parallel Room
10.15	11.30	75	Parallel Session	Parallel Room
11.30	14.00	60	Lunch	Restaurant
14.00	14.45	45	Parallel Session	Parallel Room
14.45	15.00	15	Coffee Break	In Front of Parallel Room
15.00	15.45	45	Parallel Session	Parallel Room
15.45	16.00	15	Closing Ceremony	Ballroom

Note :

- Time in Lombok local time (+8 GMT)
- **Fanres meeting will be held on November 25, 2022**
    - **Time : 09.00-10.30 am Lombok local time**
      Room : Berugak Room, Hotel Merumatta Senggigi Lombok

LIST OF OPENING SPEECH
The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes)
November 24-25, 2022. Hotel Merumatta Senggigi Lombok

No.	Name	Position
1.	Prof. Yuli Witono	President of FANRes International Network Director of Research and Community Service Jember University, Indonesia
2.	Prof. Ir. Bambang Hari Kusumo, M.Agr.St., Ph.D.	Rector of Mataram University, Indonesia
3.	Dr. H. Zulkieflimansyah, S.E., M.Sc.	Governor of West Nusa Tenggara, Indonesia

LIST OF KEYNOTE SPEAKERS
The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes)
November 24-25, 2022. Hotel Merumatta Senggigi Lombok

No.	Name	University
1.	Prof. Patricia Rayes-Duarte	Oklahoma State University, USA
2.	Prof. Julian Hayes	Massey University, New Zealand
3.	Prof. Byuong-Kwan Cho	Chungnam National University, South Korea
4.	Dr. Ir. Bambang Supriyanto, M.Sc.	Ministry of Environmental and Forestry of Republic Indonesia
5.	Yu-Kuo Chen, Ph.D.	National Pingtung University of Science and Technology, Taiwan
6.	Prof. Shinjiro Ogita	Prefectural University of Hiroshima, Japan
7.	Zulhamsyah Imran	IPB University/SEAMEO BIOTROP, Indonesia

LIST OF INVITED SPEAKERS
The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes)
November 24-25, 2022. Hotel Merumatta Senggigi Lombok

No.	Name	University
1.	Baiq Rien Handayani, SP., M.Si., Ph.D.	University of Mataram, Indonesia
2.	Dr. Suhaizan LOB	University of Malaysia Terengganu, Malaysia
3.	Asst. Prof. Dr. Pavalee Chompoorat Tridtitanakiat	Maejo University, Thailand
4.	Dr. Rafael Tolosana Calasanz	Zaragoza University, Spain

The 7th IC-FANRes 2022, Lombok, Indonesia
PARALLEL SESSION SCHEDULE (Invited & Presenter)
(OFFLINE)

Room 1(On-site) : Meeting Room, Hotel Merumatta Senggigi Lombok
Topic : Agricultural, Natural Science, Food Technology, Food Security
Date : November 25, 2022
Moderator : Dr. Ansar, S.Pd., M.P., M.Pd.
Operator :

Time		Paper ID	Author	Titles
Start	**Over**			
07.45	08.10		Registration	
08.10	08.30	Invited	Dr. Ansar, S.Pd., M.P., M.Pd.	Physical Characteristic Analysis of Shells Coconut Briquette
08.30	08.50	invited	Dr. Suhaizzan Lob	Potential of plant extract for plant disease control
08.50	09.00	-	Q&A	
9.00	09.10	FR020	Amuddin, Ida Ayu Widhiantari, Rosyid Ridho, Fakhrul Irfan Khalil, Wahyudi Zulfikar	Design and Build Compost Block Pressing Machine from Organic Waste with Hidraulic System
9.10	09.20	FR026	Sirajuddin Haji Abdullah, Asih Priyati , Joko Sumarsono , Gagassage Nanaluih De Side	Temperature and Humidity Control using Nextion 3.2 HMI in The Natural Greenhouse
09.20	09.30	FR009	Dina Fithriyani , Amalia Wahyuningtyas, Alviany Mayska Sugiarty	Identification of Coliform, Escherichia coli Contamination, and Evaluation of GMP Fulfillment in Iced Coffee Milk Sugar Palm Drinks in Bandar Lampung
09.30	09.40	-	Q&A	
09.40	09.50	FR040	Dewa Nyoman Adi Paramartha, Zainuri, Qabul Dinanta Utama, Ameliana Saputri, Ines Marisya Dwi Anggraini	GREEN BEAN DECAFFEINATION OF ROBUSTA COFFEE (Coffea canephora) ORIGINATED FROM RINJANI LOMBOK USING PINEAPPLE EXTRACT(Ananas comosus)

09.50	10.00	FR053	R Widyasari , B Dwi Argo , A Lastriyanto , S Wijana , K Yuniarto	Application of the Natural Antimicrobial Kayu purut (Dysoxylum parasiticum) to Delay Palm Sap (Arenga pinnata sap) Decay
10.00	10.10	FR056	Lince Mukkun, Yasinta L. Kleden, Herianus J.D. Lalel	The Potential of Migratory Locusts (Locusta migratoria Meyen) As An Alternative Source of Protein, Amino Acids, And Other Important Bioactive Compounds
10.10	10.20	-	Q&A	
10.20	10.30	FR057	S. Sukmawaty, Murad, A. Ramadhan, A. Priyati, S. Syahrul	Energy Analysis on Continue and Discontinue Drying Process of Corn (Zea Mays) Using Vertical Dryer
10.30	10.40	FR059	Noni Juniati Oematan , Julinda BD. Henuk , Mayavira V. Hahuly , Agnes V. Simamora	Pathogens Associated with Potato Plants in Fatumnasi District
10.40	10.50	FR062	Noni Juniati Oematan , Julinda BD. Henuk , Mayavira V. Hahuly , Agnes V. Simamora	Pathogens Associated with the Declining of Nuabosi Cassava in Ende, East Nusa Tenggara
10.50	11.00	FR070	A. Priyati, S. Sukmawaty, R. P. Hari, S. Syahrul	Technical and Economic Analysis of Drying Process of Grain (Oryza Sativa) Using Vertical Dryer Machine
11.10	11.20	FR095	Nurul Faziha Ibrahim, Muhammad Amali Aizat Muhammad Harisi, Suhaizan Lob	Potential of Compost Tea to Inhibit Plant Diseases in Agricultural Crops
11.20	11.30	-	Q&A	
11.30	14.00		Lunch	Restaurant
14.00	14.10	FR002	Satrijo Saloko, Lulu Qolbuani Rahman, Rini Nofrida	THE EFFECT OF TEMPERATURE AND DRYING TIME ON THE SHELF LIFE OF SERBAT FROM SOLID PALM SUGAR
14.10	14.20	FR037	E. Basuki, A. Alamsyah and I W. S.Yasa	Inhibition of ACCO (1-aminocyclopropane 1-carboxylic acid oxidase) Activity of Mango by Modified Atmosphere Storage

14.20	14.30	FR043	Angela Wulansari, Hamidin Rasulu, Ikrima M. Mustafa, Suwito, Juharni, Janiah Husen	Value Added Analysis and Development Strategy of Canned Traditional Food Sayur Lilin (Saccharum edule)
14.30	14.40		Q&A	
14.40	14.50	FR047	Murad, Joko Sumarsono, Sukmawaty, Amni Aulia, dan Syahroni Hidayat	Detection of Sugar Apple (Annona squamosa L.) Ripeness Based on Physical and Chemical Properties Using the K-Nearest Neighbor (k-NN) and Random Forest Algorithm
14.50	15.00	FR099	Rahmat Sabani, Ari Handono Ramelan, Pranoto, Mohammad. Masykur	Community Based Integrated Organic Solid Waste Management In Sandik Village West Lombok Districh
15.10	15.20	FR068	Ansar, Nazaruddin, Atri Dewi Azis	Analysis of pH value and Color of Palm Sap (Arenga pinnata Merr) during Storage
15.20	15.30		Q&A	
15.30	15.40	FR066	Ahmad Alamsyah, Dewa Nyoman Adi Paramartha, Qabul Dinanta Utama, Raudatul Jannah, Fihiruddin Fihiruddin, Nurul Inayati, and Lalu Unsunnidhal	The Potential of Trigona Honey as A Functional Food Solution for Malnutrition in Menggala Village, North Lombok Regency, West Nusa Tenggara Province
15.40	15.50	FR033	Yelliantty	APPLICATION OF FRUIT-BASED FOOD INGREDIENT FROM ANTIDESMA BUNIUS (L.) SPRENG. IN PROCESSED FOOD
15.50	16.00	FR100	Rahmat Sabani, Sukmawaty, Ansar, Murad, Hanifah Ayu	Damage Detection System for Avocado (Persea Amaricana Mill) Using Gas Sensors With Stratified K-Fold Cross Validation Method
16.00	16.10		Q&A	
16.10	16.15		Closing Ceremony	Ballroom

The 7th IC-FANRes 2022, Lombok, Indonesia
PARALLEL SESSION SCHEDULE (Invited & Presenter)
(OFFLINE)

Room 2 (On-site) : Meeting Room, Hotel Merumatta Senggigi Lombok
Topic : Food Technology
Date : November 25, 2022
Moderator : Zainuri, Ph.D
Operator :

Time		Paper ID	Author	Titles
Start	Over			
07.45	08.10		Registration	
08.10	08.30	Invited	Baiq Rien Handayani, Ph.D	Assessment of pathogenic bacteria and hazardous chemicals contamination in shrimp paste of west nusa tenggara
08.30	08.50	-	Q&A	
08.50	09.00	FR097	Moegiratul Amaro, Winda Herliana Putri, Baiq Rien Handayani, Mutia Devi Ariyana, Tri Isti Rahayu, Sri Widyastuti, Nazzaruddin	The effect of sterilization time on organoleptic quality rarang chicken in retort bag packaging
09.00	09.10	FR091	Lailatul Azkiyah, Yuli Witono, Iwan Taruna, Miftahul Choiron, Ahmad Nafi', and Anggita A. Aini	The Effect of Wall Material Ratio and Drying Methods on The Encapsulation Behavior and Antioxidant Activity of Lemuru (Sardinella lemuru) Smart Flavor
09.10	09.20	FR044	Siska Cicilia, Ahmad Alamsyah, Sweca Yasa	Utilization of Yellow Sweet Potato and Telang Flower Juice to Increase Antioxidants of Cookies
09.20	09.30	FR085	Novia Rahayu, Zainuri, Rini Nofrida, Dewa Nyoman Adi Paramartha, Qabul Dinanta Utama, Ines Marisya Dwi A, Amira Fathinah	The Physicochemical Properties of Green Bean Robusta from North Lombok
09.30	09.40	-	Q&A	

09.40	09.50	FR098	Dody Handito, I Wayan Sweca Yasa, Satrijo Saloko and Desy Wulandari	Rice Noodle (Vermicelli) Characteristics Made From Local Cultivar Red Rice and Corn Starch
09.50	10.00	FR089	Zainuri, Hartanti, Dody Handito	Pumpkin enriched shirataki noodle as a low calorie and nutritious functional food
10.10	10.20	FR081	Joko Sumarsono, Murad, Ida Ayu Widhiantari1, Syahroni Hidayat, Ulfah Mediaty Arief, Tatyantoro Andrasto	The Best Combination of Gas Sensor and Machine Learning Classification Algorithm in Detecting Mango (Mangifera indica L.) Quality
10.20	10.30	-	Q and A	
10.30	10.40	FR069	Zainuri, Taslim Sjah	Quality is important, useful and the key for successful mango business
10.40	10.50	FR087	Mutia Devi Ariyana, Baiq Rien Handayani, Sri Widyastuti, Nazaruddin, Moegiratul Amaro, Tri Isti Rahayu, Winda Herliana Putri and Asep Nurhikmat	Evaluation of Stability and Physicochemical Quality of "Rarang" Chicken in a Retort Pouch Packaging with Different Sterilization Times
10.50	11.00	FR088	Mutia Devi Ariyana, Baiq Rien Handayani, Moegiratul Amaro, Tri Isti Rahayu, Neta Sofa Afriliya and Asep Nurhikmat	Sensory Quality of Sate Rembiga in a Retort Pouch Packaging with Different Sterilization Time
11.10	11.20	FR090	Tri Isti Rahayu, Baiq Rien Handayani, Mutia Devi Ariana, Moegiratul Amaro, and Yesica Marcelina Romauli Sinaga	Combination Activity of Lactic Acid Bacterial Culture to Improve Quality of Honey Pineapple Yoghurt Enriched With Seaweed Eucheuma spinosum
11.20	11.30	-	Q&A	
11.30	14.00		Lunch	Restaurant
14.00	14.10	FR083	Sri Wahyuningsih, Fajar Adi Maulana	Determination of groundwater quality for minapadi using the iwqi method in sanenrejo village, jember regency

14.10	14.20	FR064	Baiq Rien Handayani, Afrisha Sekar Namira, Mutia Devi Ariyana, Moegiratul Amaro, Tri Isti Rahayu, Asep Nurhikmat	Physical and sensory quality of canned "rarang"chicken under sterilization time difference
14.20	14.30	FR092	Satrijo Saloko, Siska Cicilia, Lara Mahya Adila2	Development of Functional Sausage Made of Corn Starch and Moringa Flour With The Addition of Mocaf (Modified Cassava Flour) and Porang Flour
14.30	14.40		Q&A	
14.40	14.50	FR032	Wilbur Donald Raymond Pokatong, Febiana Christy	Partial Substitution with Heat-Moisture Treated Sweet Potato (Ipomoea Batatas L.) Flour To Wheat Flour Affecting Physicochemical and Organoleptic Characteristics of Pan Bread
14.50	15.00	FR086	Rosyid Ridho, Asih Priyati, Joko Sumarsono, Qabul Dinanta Utama, Tina Afriana, Deas Fitriani Sahrani Jayadi	Test of Consistency, Hardness, and Water Absorption on Innovative Planting Media (Block Compost) as a Solution for Utilization of Oyster Mushroom Baglog Waste
15.10	15.20	FR067	Qabul Dinanta Utama, Zainuri, Dewa Nyoman Adi Paramartha, Ines Marisya Dwi Anggraini, Amira Fathinah	The Physicochemical Properties of Green Been Arabica From Different area in Lombok Island
15.20	15.30	FR063	Lalu Unsunnidhal, Nazaruddin, Dewa Nyoman Adi Paramartha, Qabul Dinanta Utama, Raudatul Jannah, Lalu Riza, Sukarne	The Quality of Liquid Sugar from Sorghum Grown in East Lombok Regency, West Nusa Tenggara Province with The Addition of Natural Complementary Ingredients
15.30	15.45	FR096	Fakhrul Irfan Khalil Rahmat Sabani	Simulation Of Turbine Road Wheel (Runner) Models in Microhydro Power Plant (PLTMH) Systems by Completing Dimensional Analysis
15.45	16.00		Q&A	

16.00	16.15		Closing Ceremony	Ballroom

The 7th IC-FANRes 2022, Lombok, Indonesia
PARALLEL SESSION SCHEDULE (Invited & Presenter)
(ONLINE)

Room 3 (online) : Zoom Meeting
Topic : Agricultural, Natural Resources,
Date : November 25, 2022
Moderator : I Wayan Sweca Yasa, M.Si
Operator :

Time		Paper ID	Author	Titles
Start	Over			
08.00	08.30		Registration	
08.30	08.40	FR001	Yanna Yahya, Machmud Ahmad, Iqbal	ANALYSIS OFF MASS AND ENERGY BALANCE ON CORN AGROINDUSTRY IN SIDENRENG RAPPANG REGENCY (CASE STUDY : CV. CAHAYA MARIO)
08.40	08.50	FR005	Andi Jaya Nasaruddin, Fithri Choirun Nisa, Mochamad Nurcholis	The Effect of Ultrasonication Pretreatment Process on The Characteristics of Goat Milk Yoghurt
08.50	09.00	FR007	Sandra, Retno Damayanti, Mochamad Bagus Hermanto, Rut Januar Nainggolan, Danuh Kanara Anta, Arini Robbil, Siska Ratna Anggraeni, Mitha Saadiyah	Identification of nitrogen content of Vernonia amygdalina leave based on artificial neural network modeling
09.00	09.10	-	Q&A	
09.10	09.20	FR008	Tri Dewanti Widyaningsih, Fithri Choirun Nisa, Fitri Khoirunnisa' Maftuch, Novia Dewi Putri Agus Pranoto l	OPTIMIZATION OF HERBAL JUICE FORMULA (MIXTURE OF SINGLE ONION, RED GINGER, LEMON, APPLE Vinegar, AND HONEY) AS A FUNCTIONAL BEVERAGE
09.20	09.30	FR010	Neyla Vista Maramy, Tri Dewanti Widyaningsih, Erryana Martati, Zahra Zafira	OPTIMIZATION FORMULA OF MINASARUA FROM BIMA WEST NUSA TENGGARA AS A FUNCTIONAL BEVERAGE

09.30	09.40	FR011	Melanie Cornelia, Vanessa, Titri S Mastuti, Reynaldi	Characteristics of Fruit Wine from Several Types of Banana with Various Types of Yeast
09.40	09.50	-	Q&A	
09.50	10.00	FR014	Wisnu Cahyadi, Anis Nur Farida, Yusep Ikrawan	"Effect of Yeast Concentration and Moromi Fermentation During toward The Characteristics of Sorghum Grain Sweet Soy Sauce (Sorghum Bicolor (L.) Moench)"
10.00	10.10	FR021	Eunike Budiman, Tagor M. Siregar	EFFECT OF COATING MATERIAL RATIO AND SPRAY DRYER INLET TEMPERATURE ON THE CHARACTERISTICS OF BUTTERFLY PEA FLOWER (Clitoria ternatea L.) EXTRACT MICROCAPSULE
10.10	10.20	FR024	Ratna Nurmalita Sari, Nuramaliyah	Maternal Legumes and Nuts Consumption is Associated with Protein Content in Human Milk
10.20	10.30	-	Q&A	
10.30	10.40	FR034	Yusuf Hendrawan, La Choviya Hawa, Retno Damayanti, Dimas Firmanda Al Riza, Mochamad Bagus Hermanto, Sandra Malin Sutan	Optimized Digital Webcam with Hungry Roach Infestation Optimization to Monitor the Drying Process of Cassava Chips
10.40	10.50	FR036	Ratri Retno Utami, Andi Nur Amalia, M. Ardhias Syam, Rahmad Wahyudi, Rachma Ramadhanty Tabri	Application of Hygiene and Sanitation in The Hairtail Fish Freezing Industry
10.50	11.00	FR046	Widya Dwi Rukmi Putri, Ambo Wellang, Joni Kusnadi, Wenny Bekti Sunarharum, Mokhamad Nur	Pectin Extraction of Red Dragon Fruit Peels (Hylocereus polyrhizus) and Its Potency for Bioplastic Production
11.00	11.10	FR051	Susanawati, Siti Nurul Aldina, Heri Akhmadi	Responsibility of Red Chili Supply Chain in The Production Center of Yogyakarta

				Indonesia Based on Performance Measurement System
11.10	11.20	-	Q&A	
11.20	14.00		Lunch	Restaurant
14.00	14.20	Invited	Dr. Rafael Tolosana Calasanz	IoT technologies applied to forestry
14.20	14.30		Q&A	
14.30	14.40	FR055	Dian Hasni, Cut Nilda , Murna Muzaifa, Dini Fadillah, Syafina Asra, and Dedy Rahmad	Consumer Acceptance of Herbal Tea Brewing Based on Cascara Dayak Onion Ratio and Infusion Time
14.40	14.50	FR073	Tasya Chairuna Pane and Muhammad Khaliqi	The effect of religiosity level on the perceptions of young Muslim consumers towards Halal food criteria in Indonesia
14.50	15.00	FR074	A D Anggita, E Wahyuni, D Maharani, Nurliyani	The quality and chemical composition of eggs derived from Kampung Unggul Balitbangtan (KUB) crossed with Merawang and Murung Panggang local chickens
15.10	15.20		Q&A	
15.20	15.30	FR075	Eni Istiyanti, Dian Widi Anitasari, Retno Wulandari	The Development Strategy of Organic Rice Farming in Bantul Regency, Special Region of Yogyakarta, Indonesia
15.30	15.40	FR080	I Wayan Sweca Yasa, Eko Basuki, Ahmad Alamsyah, Lingga Gita Dwika Sari	The Application of Nata de coco-based Coatings to Fresh-cut Jackfruits during Refregerated Storage
15.40	15.50	-	Q&A	
15.50	16.15		Closing Ceremony	Ballroom

The 7th IC-FANRes 2022, Lombok, Indonesia
PARALLEL SESSION SCHEDULE (Invited & Presenter)
(ONLINE)

Room 4 (online) : Zoom Meeting
Topic : Agricultural, Natural Science
Date : November 25, 2022
Moderator : Dr. Kurniawan Yuniarto
Operator :

Time		Paper ID	Author	Titles
Start	Over			
08.00	08.30		Registration	
08.30	08.50	Invited	Asst. Prof. Dr. Pavalee Chompoorat Tridtitanakiat	modeling rheological properties of gluten-free red kidney bean cupcake with rice flour addition
08.50	09.00	-	Q&A	
09.00	09.10	FR006	Bambang Susilo, Mochamad Bagus Hermanto, Retno Damayanti, Pipit Elok Nikmatus Sholikah	The performance of a modified dehumidifier drying machine for peanut seeds (Arachis hypogaea L.) drying
09.10	09.20	FR012	Dini Retno Widyaningsih, Ning Puji Lestari and Dian Purbasari	Life cycle assessment of coffee processing processes at cafe bromo probolinggo
09.20	09.30	FR015	Ach. Fauzan Mas'udi, Marga Mandala, Priza Pandunata, Shinta Hapsari	Mapping of Soil Quality Index for Dryland in Pasuruan Regency, East Java, Indonesia
09.30	09.40	-	Q&A	
09.40	09.50	FR016	Mohamad Wawan Sujarwo, Arif Rohmattulloh, Indarto Indarto, Siswoyo Soekarno, Rufiani Nadzirah.	Land Use and Land Cover (LULC) Changes in The Eastern area of East Java on Urban Segmentation: Sentinel Imagery Based
09.50	10.00	FR017	Mahrus Irsyam, Indarto, Farid Lukman Hakim, Achmad Subagio	Using IFSAR DEM to Design of Site-Plan and Site-Grading in Cassava Plantation

10.00	10.10	FR018	Inayatus Nur Dwiyanti,, Riska Rian Fauziah, and Ancah Caesarina Novi Marchianti2	Identification Sensory Profile of Noni Juice Health Drink Using Quantitative Descriptive Analysis (QDA) Method
10.10	10.20	-	Q&A	
10.20	10.30	FR019	Chairiyah Umi Rahayu, Mahrus Irsyam,Indarto Indarto, Bayu Taruna WP, and Siswoyo Soekarno	UAV mapping for wide areas cassava food estate plantation design
10.30	10.40	FR030	Ning Puji Lestari, Siswoyo Soekarno, Amal Bahariawan, Tasliman, Taufan Sugiarto	Characteristics of Corn (Zea Mays) Seeds Drying Using a Vertical Rack-Type Dryer
10.40	10.50	FR031	Rufiani Nadzirah, Priza Pandunata, Indarto Indarto, Ivo Joan Pamungkas, Nanak Hariyanto, Ricco Andika.	Characteristics of Red Beans (Phaseolus vulgaris L.) Seeds Drying Using a Vertical Rack-Type Dryer
10.50	11.00	-	Q&A	
11.00	11.10	FR041	Farid Lukman Hakim, Indarto Indarto, Bowo Eko Cahyono	Assessment of Land Use and Land Cover Change in East Java from 1972 to 2021
11.10	11.20	FR042	Aris Slamet Widodo, Gatot Supangkat, Mulyono, Bahrul Ulum	Development of Floating Rice Cultivation Technology in Community-Based Peat Swamp Land in East Kalimantan
11.20	11.25	-	Q&A	
11.25	14.00		Lunch	Restaurant
14.00	14.10	FR045	Mochamad Bagus Hermanto, Retno Damayanti, Yusuf Hendrawan	The design and performance of maggot harvester
14.10	14.20	FR071	Kurniawan Yuniarto, Cahyo Mustiko Okta Muvianto, Fatimah Khairunnisa	The Ultrasound Cavitation on Physical and Chemical Attributes of Lemongrass Oil

14.20	14.30	FR076	WINALDHA AISYALHANI DAMAR PUTRI, ENI HARMAYANI, SRI RAHAYOE	Effect of using re-distilled ethanol for glucomannan extraction process from porang flour (amorphophallus oncophyllus) on the physicochemical characteristics of glucomannan
14.30	14.40		Q&A	
14.40	14.50	FR078	Putri Prasada Mukti, Eni Harmayani, Sri Rahayoe	EFFECT OF SODIUM METABISULFITE IN GLUCOMANNAN EXTRACTION PROCESS FROM PORANG FLOUR (Amorphophallus onchophyllus) ON CHEMICAL AND PHYSICAL CHARACTERISTICS OF GLUCOMANNAN
14.50	15.00	FR082	La Rianda Baka, Tamrin, Idrus Salam, Ulyasniati, Halija Koso	An analysis on determination of key elements of coconut processing business development system problems in konawe district, islands through interpretive structural modelling method
15.10	15.20	FR084	Diah Indriani Widiputri, Benedick Donato, Maria DPT Gunawan-Puteri, Filiana Santoso, Elena Listianto Lie	Ethanolic Extraction of Lemongrass in a Scaled-Up Laboratory Percolator
15.20	15.30	-	Q&A	
15.30	15.40	FR094	Agriananta Fahmi Hidayat, Taufik Djatna	Food production prediction based on fuzzy associative memory modeling
15.40	15.50			
15.50	16.00	-	Q&A	
16.00	16.15		Closing Ceremony	Ballroom

ABSTRACTS OF KEYNOTE

The 7th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes)

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FR014

Effect of Yeast Concentration and Moromi Fermentation During toward The Characteristics of Sorghum Grain Sweet Soy Sauce (Sorghum Bicolor (L.) Moench)

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Abstract. Sweet soy sauce is a liquid product that is usually made from soybeans. However, despite the threat of a global food crisis and the high level of Indonesia's dependence on soybean imports, sorghum is a solution as a substitute for making sweet soy sauce. This study aims were to determine the influence between yeast concentration and moromi fermentation duraing toward the characteristics of sweet soy sauce sorghum grains. The research method were carried out in some steps, including the first stage of determining the content of components in sorghum grains and the second stage of determining the influence of yeast concentration and moromi fermentation duration on the characteristics of sorghum grain sweet soy sauce. The statistical design was used a Randomized Group Design (RGD), with the first factor being yeast concentrations of 0.1%, 0.2%, and 0.3%, the second factor being the moromi fermentation duration of 2 weeks, 3 weeks, and 4 weeks. The research results, the first phase of the study, showed that bioguma 1 Agritan sorghum grains contain a protein content of 10.67%, water content of 9.93%, crude fiber of 2.33%, and tannin content of 0.22%. At the same time, the results of the second stage of the study showed that the filtrate protein content of moromi fermentation results was 4.05% - 5.08% and pH 3.0-3.3. The protein content of sweet soy sauce is 3.15% – 4.07%, the reducing sugar content is 1.54% – 3.08%, and the viscosity value is 2,744 Cp – 145,200 Cp. The sweet soy sauce products obtained have a good taste, aroma, color, and viscosity, almost the same as the sweet soy sauce circulating in the market. Overall, the results of this study show that sorghum grain sweet soy sauce can be a solution to increasing food diversification.

Keywords: Sweet Soy Sauce, Sorghum Grain, Yeast, Moromi Fermentation

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Effect of Yeast Concentration And Moromi Fermentation Duration On The Characteristics Of Sorghum Seed Sweet Soy Sauce (Sorghum Bicolor (L.) Moench)

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Abstract. Sweet soy sauce is a liquid product, blackish brown redundant and has a sweet taste, using fermented raw materials or not, then added sugar with or without the addition of other foodstuffs. This study aims to determine the influence between yeast concentration and moromi fermentation duration on the characteristics of sweet soy sauce sorghum seeds. The research method used a Randomized Group Design (RAK) with a factorial pattern (3x3) of 3 repeats. The first factor is the yeast concentration of a1 (0.1%), a2 (0.2%), and a3 (0.3%). The second factor is the duration of moromi fermentation b1 (2 weeks), b2 (3 weeks), and b3 (4 weeks). This research was carried out in two stages, namely, the phase 1 sorghum seed study of Bioguma 1 Agritan has a protein content of 10.6654% w / b, the water content of 9.9325% w / w, the crude fiber of 2.3302% w / b, and tannin content of 0.2205% b / v. The results of the phase 2 study, the protein content of moromi fermentation filtrate was 4.0475% w / b - 5.0784% w / w and pH 3.0-3.3. The protein content of sweet soy sauce is 3.1492% w/b – 4.0760% w/b, the reducing sugar content is 1.5439% w/b – 3.0780 % w/b, the viscosity value is 2,744 Cp – 145,200 Cp. Organoleptic response of sweet soy sauce color attributes, soy sauce is dense blackish brown to very concentrated, the most preferred treatment a3b1 (4.7367) and a3b3 (4.6333). Soy sauce has a characteristic aroma of neutral to fragrant soy sauce, the aroma of all treatments does not show a very noticeable difference. Sweet soy sauce has a slightly sweet to sweet taste, the most preferred is the a3b3 (3.8433) treatment. Sorghum sweet soy sauce has a slightly thick to very thick texture, the soy sauce whose viscosity is most preferred is the a3b3 treatment (4.7667).

Keywords*: Sweet Soy Sauce, Sorghum Seed, Yeast, Moromi Fermentation*

1. INTRODUCTION

Sweet soy sauce is a liquid product, blackish-brown in color and has a sweet taste. The manufacture of sweet soy sauce usually uses fermented soybean raw materials or soybean meal or not which is then added with sugar with or without the addition of other foodstuffs and permitted food additives. Sweet soy sauce is a product that can add flavor to food, so the level of consumption of sweet soy sauce in Indonesia is still very high.

Soybeans are still the main commodity commonly used as raw materials for making sweet soy sauce. However, there is a gap between soybean production and the national needs of soybeans, so the government needs to import from soybean producing countries. Based on data from the Central Statitik Agency (2020), the level of dependence on soybean imports in Indonesia over the past five years has reached 78.44% per year. Soybean raw materials also at the beginning of 2021 experienced an increase in prices globally, so that producers who use soybeans as their main raw material have decreased the amount of production which has an impact on the amount of income that decreases.

Recently, President Joko Widodo (Jokowi) mentioned the threat of a food crisis that has hit the world. This is due to the occurrence of Covid-19 and the war between Ukraine and Russia. During his working visit to East Nusa Tenggara in June 2022, President Joko Widodo said that the community should start producing their own staple food sources such as rice, corn, sorghum, and porang. In particular, President Jokowi said that he wanted to increase sorghum production as a source of carbohydrates to replace rice and wheat. Seeing the potential of East Sumba, NTT as an area that can become a place for sorghum cultivation in Indonesia, President Jokowi instructed his staff to expand the sorghum land area. Currently, the sorghum land area until June 6, 2022 is 4,355 hectares (ha) spread across 6 provinces in Indonesia. As well as sorghum production has reached 15,243 tons or with a productivity level of 3.63 tons per ha.

In order to reduce dependence on soybean imports in Indonesia, it is necessary to use other foodstuffs that can be used to produce food diversification. One of the commodities that can be used as a substitute raw material in the manufacture of sweet soy sauce is sorghum seeds. In addition, by utilizing sorghum as a processed food ingredient, it is hoped that it can create food independence, so that Indonesia does not have much impact on other countries.

Sorghum (Sorghum bicolor (L.) Moench) is a grain crop (cereal) that can be cultivated in hot and dry climates. The regions in Indonesia that produce sorghum seeds are Central Java (Purwodadi, Pati, Demak, Wonogiri), Yogyakarta Special Region (Gunung Kidul, Kulon Progo), East Java (Lamongan, Bojonegoro, Tuban, Probolinggo), parts of West Nusa Tenggara (NTB) and East Nusa Tenggara (NTT) (Sirappa M. P., 2003).

Sorghum seeds contain quite high carbohydrates, so they are often used as raw materials for brewing beer, starch, liquid sugar (syrup), and others (Human S, 2008). Sorghum seeds contain 73% carbohydrates, 3.5% fat, and 10% protein, depending on the variety and planting site (Mudjisihono and Darmadjati, 1987). However, sorghum has antinutrient substances, namely tannins and tapenic acid which can inhibit the digestibility of proteins and carbohydrates in the body. The content of tannins and tapetic acid in sorghum seeds can be lowered through an appropriate processing process. White seed sorghum (white grain sorghum) has a low tannin content so it is ideal to be used as a food raw material. Even white seed sorghum can be consumed by people who have an allergy to gluten (Human S, 2008).

The manufacture of sweet soy sauce of sorghum seeds is obtained from the fermentation of white sorghum seeds plus brown sugar with the addition of other foodstuffs. There are 3 ways to make sweet soy sauce, namely fermentation, hydrolysis, and hydrolysis-fermentation. The manufacture of soy sauce by fermentation is most often used because it produces the aroma and taste that is most in demand by consumers. The manufacture of soy sauce by fermentation has principles on the decomposition of proteins, carbohydrates, and fats carried out by enzymes produced by microbes, into simpler compounds that affect the aroma, taste and composition of soy sauce (Santoso, 2005).

The soy sauce fermentation process consists of 2 stages, namely solid fermentation (koji fermentation) and liquid fermentation (moromi fermentation). Fermentation of koji is carried out by mold that lasts for 2-3 days (Setiawati, 2006). The yeast used is yeast with an instant dry yeast type until koji is formed. Then proceed with the fermentation of moromi using a 20-30% saline solution. Moromi fermentation usually takes 14-28 days, then moromi plus sugar, spices and thickened (Meutia, Y.R., 2015). The duration of moromi fermentation is one of the determinants of quality in making sweet soy sauce, it is related to the breakdown of peptide compounds into amino acids and ammonia related to the formation of aroma and taste in soy sauce (Pratiwi R.F., et al, 2012). During the fermentation of koji and the fermentation of moromi, anzyme activity occurs due to the presence of microbial activity. The mold A. oryzae becomes dominant in the fermentation of koji which produces the enzyme protease. As much as 65-69% of proteins are converted in dissolved form in the fermentation process (Sopandi T. and Wardah, 2014). In the presence of variations in the addition of yeast (0.1%, 0.2% and 0.3%) and variations in the duration of moromi fermentation (2 weeks, 3 weeks and 4 weeks) will differ to the content of protein content, reduction sugar content, viscosity and organoleptic response of sweet soy sauce sorghum seeds. Research on the manufacture of sweet soy sauce based on sorghum seeds has not yet been found so this research is expected to become new knowledge related to the development of soy sauce based on sorghum seeds in Indonesia and can be developed commercially.

The determination of yeast concentration variations in this study is based on research conducted by Faradilla F. (2017) on the manufacture of tofu pulp soy sauce with variations in concentrations of 0.1%, 0.2%, and 0.4%. The results showed that the best yeast concentration was 0.2%/500grams of tofu pulp. The result is characterized by the entire surface of the tofu pulp evenly overgrown with white mycelia with a dense texture and a normal, non-slimy koji aroma, the result of this fermentation is called koji.

In the journal of research conducted by Naiola E. and Soeka Y.S., (2007), it is stated that moromi fermentation, namely koji, is soaked in a saline solution with a concentration of 20-30% w / v. During the moromi fermentation process, salt-resistant halophilic microbes are expected to grow and develop. Salt concentrations that are less than 20% can result in the occurrence of decay processes, while salt levels that are too high can cause inhibition of the activity of protease enzymes The temperature of 25oC-30oC is the optimal temperature for the formation of fermentation product quality.

Research conducted by Palupi A. W. (2018), the study set moromi fermentation time for 2 weeks, 3 weeks and 4 weeks. The highest protein content, total dissolved solids and total sugar of komak bean soy sauce were found in komak bean soy sauce with a moromi fermentation duration of two weeks, respectively, 6.87%, 17.45% and 56.522%. The results of the test of the level of liking for the taste and aroma of komak bean soy sauce stated that komak bean soy sauce with a moromi fermentation duration of four weeks had the highest favorability rate. Thus, based on this study, it is expected that the manufacture of sweet soy sauce of sorghum seeds with yeast variations of 0.1%, 0.2%, and 0.3% as well as variations in the duration of moromi fermentation for 2 weeks, 3 weeks, and 4 weeks will differ from physico-chemical and organoleptic characteristics.

In the research journal that has been carried out by Pratiwi R.F., et al (2012) that the manufacture of sweet soy sauce from white sesame meal has the highest viscosity found in soy sauce which is fermented moromi for 4 weeks. As well as having a preference for the aroma of sweet soy sauce with a fermentation duration of 4 weeks.

2. MATERIALS AND METHODS

2.1 RESEARCH MATERIALS

The ingredients used in making sweet soy sauce are white sorghum which is used for research obtained from sorghum farmers in the Pameungpeuk Soreang area, Bandung Regency, tempeh yeast, salt (NaCl), brown sugar, as well as spices (bay leaf, lemongrass, galangal, ginger, garlic, turmeric, pecan, coriander, and cinnamon).

The materials used in the chemical analysis are concentrated H2SO4, a mixture of K2SO4 and CuSO4 (catalyst), NaOH 30%, boric acid 4%, HCl 0.02 N, methyl red indicator, borax, distilled water, Luff Schoorl solution, 20% potassium iodide (KI) solution, 25% sulfuric acid solution (H2SO4), sodium tio sulfate solution (Na2S2O3) 0.1 N, hydrochloric acid solution (HCl) 4N or 25%, kanji indicator 0.5%, 30% sodium hydroxide (NaOH) solution, phenolfthaline indicator solution, half-base lead acetate solution or sting acetate solution, ammonium hydrogen phosphate solution ((NH4)2 HPO)4 10% or potassium ferosianide solution, anti-froth substance (antifoarming agent), asbestos, 0.255 N H2SO4 solution, 0.313 N NaOH solution, 10% K2SO4 solution, petroleum ether, and 95% alcohol.

The physical analysis material and organoleptic analysis material are sorghum seed sweet soy sauce with moromi fermentation time of 2 weeks, 3 weeks, and 4 weeks.

2.2. RESEARCH METHODS

The research method on making sweet soy sauce sorghum seeds consists of two stages, namely phase 1 research and stage 2 research.

2.2.1. Phase 1 Research

Phase 1 research aims to determine the content of sorghum seed raw materials from the Pamengpeuk area of Bandung Regency of the Bioguma 1 Agritan type by knowing how much protein content uses the Kjeldahl method (AOAC, 2005), tannin content test with spectrophotometric method (Ryanata E., 2014), water content and crude fiber test with gravimetric method (AOAC, 2005). So that sorghum soy sauce can be produced which is high in protein and low in tannins.

2.2.2. Phase 2 Research

The purpose of the phase 2 study is to determine the effect of yeast concentration and moromi fermentation duration on the characteristics of sorghum seed sweet soy sauce so as to produce sweet soy sauce sorghum seeds which have the best characteristics.

Phase 2 research is a follow-up research from preliminary research which includes: treatment design, experimental design, analysis design, and response design.

2.2.2.1 Treatment Design

The treatment design used in this study consisted of two factors, namely the concentration of yeast (A) consisting of 3 levels and the influence of fermentation duration (B) consisting of 3 levels.

Factor (A) is that the yeast concentration consists of 3 levels, namely:

a1 = 0.1%
a2 = 0.2%
a3 = 0.3%

Factor (B) is the duration of fermentation consists of 3 levels, namely:

b1 = 2 weeks
b2 = 3 weeks
b3 = 4 weeks

2.2.2.2 Trial Design

The experimental design used in this study was a Group Randomized Design (RAK) with a factorial pattern of 3x3 and three replays for each treatment combination so that an experimental plot of 27 experiments was obtained.

To prove the difference in the effect of treatment and its interaction on all observed variable responses, data analysis was carried out using the equations of the experimental design as follows:

$$Y_{ijk} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + K_k + \varepsilon_{ijk}$$

Information:

i = The multiplicity of variations in yeast concentrations (a1, a2, a3).
j = The many variations in fermentation duration (b1, b2, b3).
Yijk = Observation results for factor A of the ith level, factor B of the jth level in the k-th group
μ = General middle value
αi = Effect of yeast concentration treatment at the i-th level.
βj =Effect of prolonged treatment of fermentation at the j-th level.
(αβ)ij = Effect of AB interactions at the i-th level (from factor A), and j-level (from factor B).
εijk = Random influence (trial error) on i-th level (factor A), j-th level (factor B), i-th and j-th AB interactions.

3. RESULTS AND DISCUSSION

3.1 PHASE 1 RESEARCH

The phase 1 research carried out was to analyze protein content, water content, crude fiber content, and tannin content in the raw materials of sorghum seeds. The results of such a chemical analysis can be seen in the following:

TABLE 1. CHEMICAL ANALYSIS OF PHASE 1 RESEARCH

No	Chemical Analysis	% Content
1	Protein Content	10,6654 % w/w
2	Moisture Content	9,9325 % w/w
3	Crude Fiber Content	2,3302 % w/w
4	Tannin content	0,2205 % w/v

3.2 PHASE 2 RESEARCH

3.2.1 Koji Fermentation

The result of fermenting fermented koji fermented for 3 days is as follows:

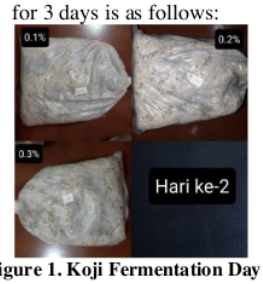

Figure 1. Koji Fermentation Day 1

Results show that sorghum seeds with the addition of yeast 0.1%, 0.2% and 0.3% have already begun to overgrow with white mycelia, rather dense texture, normal aroma, and are not slimy or juicy.

Figure 2. Koji Fermentation Day 2

Results show that sorghum seeds with the addition of yeast 0.1%, 0.2% and 0.3% are already overgrown with white mycelia, however, at the addition of yeast 0.2% and 0.3% there begins to be blackish patches, dense texture, normal aroma and not slimy or juicy.

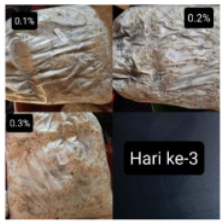

Figure 3. Koji Fermentation Day 3

The results showed that sorghum seeds with the addition of 0.1% yeast grew evenly distributed white mycellia and there were black patches, dense texture, normal aroma, not slimy and juicy, and normal taste. Sorghum seeds with the addition of 0.2% yeast grow evenly distributed white mycelia and there are black patches, dense texture, normal aroma, not slimy, and normal taste. Sorghum seeds with the addition of 0.3% yeast grow evenly distributed white mycelia and there are black patches, rather dense texture, normal aroma, not slimy, and normal taste.

3.2.2 Moromi Fermentation

1. Moromi Fermentation Protein Content

Effect of Interaction between Yeast Concentration (A) and Moromi Fermentation Duration (B) on Protein Levels of Moromi Fermentation Filtrate.

TABLE 2. PROTEIN CONTENT OF MOROMI FERMENTATION FILTRATE

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 weeks (b2)	4 weeks (b3)
0,1% (a1)	4,0475 A a	4,4243 A b	4,4173 A b
0,2% (a2)	4,4452 B a	4,7635 B b	4,7905 B b
0,3% (a3)	4,8128 C a	4,8251 B a	5,0784 C b

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

Table 2 shows that the protein content in the moromi fermentation filtrate has increased protein content along with the addition of yeast concentration and the duration of moromi fermentation.

The increase in protein levels in moromi fermentation filtrates is corroborated by research conducted by Rahayu, et al (2005) which states that an increase in protein levels during moromi fermentation shows that complex proteins undergo proteolysis by proteolysis enzymes into shorter peptide fractions and the presence of amino acids, thereby increasing the level of dissolved proteins in moromi fermented filthrates. In addition, the above shows that the protein content of fermented filtrate ranges from 4.0475% w / b - 5.0784% w / b.

1. Acidity level of Moromi Fermentation

The degree of acidity or Ph is used to express the degree of acidity or alkalinity in a substance, solution or object. The normal level of acidity has a value of 7, while acids have a pH value of < 7 and bases have a pH value of > 7.

TABLE 3. RESULTS OF THE ANALYSIS OF THE DEGREE OF ACIDITY (PH) OF MOROMI FERMENTED FILTRATE

No	Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
2 Weeks																													
1	0,1%	3,5	3,5	3,6	3,6	3,6	3,7	3,4	3,4	3,4	3,4	3,3	3,3	3,3	3,2														
2	0,2%	3,6	3,6	3,7	3,6	3,5	3,5	3,5	3,4	3,4	3,3	3,3	3,3	3,3	3,3														
3	0,3%	3,3	3,3	3,3	3,3	3,3	3,3	3,1	3,1	3,1	3,1	3,1	3,1	3,2	3,2														
3 Weeks																													
1	0,1%	3,4	3,4	3,4	3,3	3,2	3,2	3,1	3,1	3,1	3,2	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1							
2	0,2%	3,6	3,6	3,7	3,5	3,5	3,4	3,4	3,3	3,3	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2							
3	0,3%	3,3	3,3	3,4	3,3	3,3	3,3	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2							
4 Weeks																													
1	0,1%	3,4	3,4	3,4	3,4	3,3	3,1	3,1	3,1	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0
2	0,2%	3,6	3,6	3,7	3,6	3,5	3,4	3,4	3,3	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,2	3,3	3,3	3,2	3,2	3,3	3,3	3,3
3	0,3%	3,4	3,5	3,5	3,5	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3

There was a decrease in the level of acidity in all moromi fermentation samples. This shows that there is an activity of lactic acid bacteria (BAL) obtained from the fermentation of koji. Continued with the moromi fermentation process by soaking the koji in saline solution. Salts with a high concentration will be overgrown only by microbes of a halophilic nature. These bacteria play a role in shaping the taste of soy sauce. Especially Corynobacterium-type bacteria that can synthesize glutamate by breaking alpha ketoglutarate into glutamate, so that the taste of soy sauce becomes better (Rahayu, 2005).

The decrease in pH was also strengthened by research from Astuti, et al (2016) stated that the decrease in pH in moromi fermentation was caused by the process of sugar utilization by microorganisms that play a role in the fermentation process so as to produce organic acids as metabolites.

Sorghum has carbohydrates consisting of sucrose and simple confectionery. In salt solutions with high concentrations, it is suspected that there are lactic acid bacteria that have the enzyme α-galactosidase which is able to hydrolyze oligosaccharides so that they can reduce pH (Iskandar A. and Darussalam L.Y. 2020).

A decrease in pH can stimulate the growth of high salt-tolerant yeast S. rouxii. Other types of yeast that are often found in moromi fermentation are Zygasaccaromyces major, Z. sulsulus, and Z. japonicas which can produce ethanol and aroma and flavor-causing components (Sopandi T. and Wardah, 2014).

A. Sweet Soy Sauce Sorghum Seeds

1. Sorghum Seed Sweet Soy Sauce Protein

Proteins are the main macro-molecular components that are needed by living things. The function of proteins is to synthesize new proteins according to the needs of the body. Effect of Interaction between Yeast Concentration (A) and Moromi Fermentation Duration (B) on Protein Levels of Sweet Soy Sauce Sorghum Seeds.

TABLE 4. PROTEIN CONTENT OF MOROMI FERMENTATION FILTRATE

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 weeks (b2)	4 weeks (b3)
0,1% (a1)	3,2105 A b	3,1492 A a	3,2176 A b
0,2% (a2)	3,6232 B b	3,5792 B a	3,6427 B c
0,3% (a3)	3,9844 C a	4,0069 C b	4,0760 C c

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

Table 4 above shows that protein levels have increased along with the addition of yeast concentration and the duration of moromi fermentation. This is reinforced by a study from Pratiwi et al (2012) which states that there is an increase in protein levels in sesame meal soy sauce which is carried out at fermentation of 0 weeks to fermentation of 6 weeks. As well as from the research of Astuti et al (2016) stated that the increase in protein levels at the treatment of 4 weeks to 6 weeks was due to the decomposition of complex protein molecules into amino acids during the fermentation process. The longer the fermentation time results in more amino acids because the length of fermentation acquires a longer time in the breakdown of proteins. If referring to the SNI of sweet soy sauce (SNI 3543.1: 2013) the protein content is at least 1.0% w /w. The results showed that the protein content of sweet soy sauce sorghum seeds ranged from 3.1492 %w/w - 4.0760 %w/w. Then it can be said that

this sweet soy sauce of sorghum seeds is in accordance with the rules of SNI.

2. Sugar Content of Sweet Soy Sauce Reduction of Sorghum Seeds

Reducing sugar is a group of carbohydrates that can reduce compounds that can receive electrons. Monosaccharides (glucose, fructose, and galactose) and disaccharides (lactose and maltose) are reducing sugars (Nilda I., 2019).

Based on anava results (Appendix 13) on the analysis of reducing sugar content in sorghum seed sweet soy sauce samples using the Luffschrool method, it can be known that the concentration of yeast (A), the duration of moromi fermentation (B), and the interaction between yeast concentration and the duration of moromi fermentation (AB) affect the sugar content of reducing sweet soy sauce sorghum seeds (Fhitung> F) so that further testing was carried out with Duncan's further tests. The influence of yeast concentration with the duration of moromi fermentation can be seen in table 7.

TABLE 5. EFFECT OF INTERACTION BETWEEN YEAST CONCENTRATION (A) AND MOROMI FERMENTATION DURATION (B) ON SUGAR CONTENT OF SWEET SOY SAUCE REDUCTION OF SORGHUM SEEDS

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 minggu (b2)	2 weeks (b1)
0,1% (a1)	3,0780 A c	1,6041 B a	1,7739 A b
0,2% (a2)	3,1274 B c	1,5439 A a	1,8842 B b
0,3% (a3)	3,2719 C c	1,6525 C a	1,9863 C b

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

Based on the results of the analysis of reducing sugar levels using the Luffschrool method, the results were obtained that the higher the yeast concentration and the longer the moromi fermentation, the lower the content of reducing sugar levels. Sugar content in sweet soy sauce is related to the organoleptic quality of soy sauce, thus affecting consumer acceptance of sweet soy sauce (Meutia Y.R., 2015).

Based on table 5 above, it shows that the sugar content of reducing sweet soy sauce sorghum seeds ranges from 1.5439 %w/w - 3.0780 %w/b. The results also showed a decrease in reducing sugar levels along with the increase in yeast concentration and the duration of moromi fermentation. This is reinforced by the research of Astuti et al (2016) which states that the longer the fermentation, the total sugar content of sweet soy sauce will decrease due to the activity of microbes using sugar as a source of energy during the fermentation process. The fermentation stage involves the breakdown of sugars into lactic acid by lactic acid bacteria that produce alcohol and CO2 by Sacharomyces rouxii, Zygosacharomyces, and Hansenula. These molds and bacteria produce amylase and invertase enzymes that can hydrolyze sugar, so that the reducing sugar content in sweet soy sauce will be reduced.

3. Viscosity of Sweet Soy Sauce Sorghum Seeds

According to Nugraheni (2018) based on its classification, sweet soy sauce is included in liquids with a non-newtonian flow or its viscosity changes with a change in friction force between the surface of the liquid and the wall. The addition of sugar has a major effect on increasing the viscosity value of sweet soy sauce. The length of the ripening process will also have a great effect on the viscosity of the sweet soy sauce of sorghum seeds.

TABLE 6. EFFECT OF INTERACTION BETWEEN YEAST CONCENTRATION (A) AND DURATION OF MOROMI FERMENTATION (B) ON THE VISCOSITY OF SWEET SOY SAUCE SORGHUM SEEDS

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 minggu (b2)	2 weeks (b1)
0,1% (a1)	145.200 C c	8.232 B a	9.040 B b
0,2% (a2)	26.200 B c	11.097 C b	3.523 A a
0,3% (a3)	10.637 A b	2.733 A a	72.545 C c

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

Based on table 6, it shows that the viscosity value or viscosity of sweet soy sauce of sorghum seeds ranges from 2,733 Cp-145,200 Cp. Viscosity values in sorghum seed sweet soy sauce vary greatly, this is due to the interaction between variations in yeast concentration addition and moromi fermentation duration. According to Nugraheni (2008) stated that the factor that affects the viscosity of sweet soy sauce is the processing process, namely at the level of heat used during the soy sauce cooking process, stirring and the duration of the cooking process.

According to Astuti et al (2016) the viscosity of sweet soy sauce can be seen from its viscosity value, the higher the viscosity value, the soy sauce is considered to have a high viscosity. In sweet soy sauce there is no specific standard that establishes the viscosity value of sweet soy sauce. Viscosity can also be influenced by the materials used such as sugar and water, as well as affected by the amount of dissolved solids.

TABLE 7. EFFECT OF INTERACTION BETWEEN YEAST CONCENTRATION (A) AND DURATION OF MOROMI FERMENTATION (B) ON THE COLOR OF SWEET SOY SAUCE SORGHUM SEEDS

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 minggu (b2)	2 weeks (b1)
0,1% (a1)	3,1433 A a	3,2200 B a	3,1200 B a
0,2% (a2)	3,0233 A b	2,9900 A b	2,7567 A a
0,3% (a3)	4,7367 B b	3,5967 C a	4,6333 C b

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

Based on table 7 above, it shows that the interaction of yeast concentration with the duration of moromi fermentation affects the color of sweet soy sauce sorghum seeds. The longer the fermentation time of moromi produces a soy sauce color that is increasingly preferred by the panelists, namely the deep or very dense blackish brown.

Color is an important characteristic in the reception of sweet soy sauce. This is related to the browning reaction between amino acids and reduction sugars. The sugars contained in soy sauce include; glucose, galactose, maltose, silosa, arabinose, and sugar alcohol components, namely glycerol and mannitol (Sopandi T. and Wardah, 2014).

4. Organoleptic Response

a. Color

The color factor affects the determination of the quality of a food product. Color can be an indicator in determining freshness, uniformity and evenness in a food processing, as well as being an attraction for consumers (Liani I.E., 2018).

b. Aroma

Aroma is defined as something that is observed by the sense of disfigurement that is the nose. Substances must be able to evaporate, slightly soluble in water, and slightly soluble in fat. The resulting compound will have a smell all the way into the tissues of the dissident in the nose along with the air (Yuliani, 2014).

TABLE 8. ANALYSIS OF VARIANCE (ANAVA) AROMA ATTRIBUTES OF SWEET SOY SAUCE SORGHUM SEEDS

SK	DB	JK	KT	F count	F 5%	Notation	Desc.
Group	2	0,0113	0,0056	0,0111	3,63	tn	No Different very real
A	2	0,0802	0,0401	0,0789	3,63	tn	No Different very real
B	2	0,0060	0,0030	0,0059	3,63	tn	No Different very real
AB	4	0,0332	0,0083	0,0163	3	tn	No Different very real
ERROR	16	8,1307	0,5082				
Total	26	8,2613					

Information:

(*) = 5% effect

(tn) = No noticeable effect at the level of 5%

Based on the ANAVA table, it is known that Fhitung < F at the level of 5% or a confidence level of 95%, so it can be concluded that, between the yeast concentrations (0.1%, 0.2% and 0.3%) with the duration of moromi fermentation (2, 3, and 4 weeks) have no noticeable effect on the aroma of sweet soy sauce of sorghum seeds with marked with the symbol tn (no real effect). Then there is no need to continue with Duncan's further test.

At the fermentation stage, aromas and flavors will be formed in the presence of a mixture of several flavor-forming compounds formed during the fermentation process (Wulandari, 2008). In this case the aroma attribute in soy sauce does not show a significant influence, on the sweet soy sauce aroma of sorghum

seeds because the aroma is dominated by the aroma from brown sugar that masks other aromas resulting from the moromi fermentation process. The panelist's assessment of the sweet soy sauce aroma of sorghum seeds is that soy sauce has a neutral to fragrant or distinctive aroma of sweet soy sauce.

c. Taste

Taste is the main parameter in the acceptance of sweet soy sauce, taste is also one of the factors in determining the quality of a food product. The taste of soy sauce is influenced by the composition of sugars and volatile compounds from the sugars used (Apriyanto and Wiratma, 1997).

TABLE 9. EFFECT OF INTERACTION BETWEEN YEAST CONCENTRATION (A) AND DURATION OF MOROMI FERMENTATION (B) ON THE CHARACTERISTIC TASTE OF SWEET SOY SAUCE OF SORGHUM SEEDS

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 minggu (b2)	2 weeks (b1)
0,1% (a1)	3,2567 A a	3,0533 A a	3,4100 A a
0,2% (a2)	3,3767 A a	3,4567 B a	3,2433 A a
0,3% (a3)	3,5767 A b	3,2200 A a	3,8433 B c

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

The taste of sweet soy sauce can be influenced by the content of sugar and volatile compounds from brown sugar used in making soy sauce (Apriyanto and Wiratma, 1997). The longer the moromi fermentation time, the more savory and sweet the taste will be. There are two enzymes that play a role in the formation of flavors in the mold fermentation process, namely the protease enzyme which plays a role in providing a meaty (savory) taste and the carbohydrase enzyme (α-amylase, amiloglukosidase and maltase) which plays a role in providing a sweet taste (Badriah, 2007).

The factor that affects the quality of the taste of soy sauce is the fermentation process because in this process mold will produce enzymes that can break down the substrate into dissolved compounds. The dissolved compound is what affects the sweet soy sauce taste produced (Astuti et al, 2016). The panelist's assessment of the sweet soy sauce taste of sorghum seeds is that soy sauce has a slightly sweet to sweet taste.

d. Viscosity

Viscosity is an obstacle that resists the flow of liquid substances molecularly caused by the random motion of the liquid molecules (Astuti et al, 2016). The viscosity of the sweet soy sauce of sorghum seeds is also due to the addition of brown sugar. Viscosity can also be a parameter of consumer acceptance level of sweet soy sauce.

TABLE 10. VISCOSITY OF SWEET SOY SAUCE SORGHUM SEEDS

Yeast Concentration (A)	Duration of Moromi Fermentation (B)		
	2 weeks (b1)	3 minggu (b2)	2 weeks (b1)
0,1% (a1)	4,6467 B b	2,9567 B a	3,0333 A a
0,2% (a2)	3,2433 A a	3,0300 B a	3,2000 A a
0,3% (a3)	3,5433 A b	2,3433 A a	4,7667 B c

Information:

Lowercase letters are read horizontally capital letters are read vertically, the average value followed by the same letter does not differ markedly based on the Duncan test at a real level of 5%, or with a confidence level of 95%.

According to Nugraheni (2008) states that the factors that affect the final viscosity of sweet soy sauce are the processing process, namely the level of heat used, stirring and the length of the sweet soy sauce cooking process. Based on the results of organoleptic testing of the viscosity attribute of sweet soy sauce of sorghum seeds, it was found that the viscosity most preferred by the panelists was an a3b3 sample (0.3% yeast concentration with a fermentation duration of 4 weeks) with an average yield of 2.293. The panelists' assessment of the thickness of the sorghum seed sweet soy sauce was rather viscous to viscous.

4. CONCLUSION

Based on the results of the research conducted, the following conclusions can be drawn:

1. The results of the phase I research analysis on sorghum seeds have a protein content of 10.6654% w / b, water content of 9.9325% w / b, crude fiber content of 2.3302% w / b, and tannin content of 0.2205% b / v.

2. The concentration of yeast (A) affects the protein content in the moromi fermentation filtrate, the protein content of sweet soy sauce of sorghum seeds, the content of reducing sugars, viscosity, color attributes, taste, and viscosity of sweet soy sauce of sorghum seeds. However, it has no noticeable effect on the sweet soy sauce aroma of sorghum seeds.
3. The duration of moromi fermentation (B) affects the protein content in the moromi fermentation filtrate, the protein content of sweet soy sauce sorghum seeds, the content of reducing sugar, viscosity, color attributes, taste, and viscosity of sweet soy sauce sorghum seeds. However, it has no noticeable effect on the sweet soy sauce aroma of sorghum seeds.
4. The interaction of yeast concentration (A) with the duration of moromi fermentation (B) affects the protein content in the moromi fermentation filtrate, the protein content of sweet soy sauce sorghum seeds, the content of reducing sugar, viscosity, color attributes, taste, and viscosity of sweet soy sauce sorghum seeds. However, it has no noticeable effect on the sweet soy sauce aroma of sorghum seeds.
5. The chemical response to the analysis of protein levels in moromi fermentation filtrates showed the results that the protein content of moromi fermentation filtrates ranged from 4.0475% w /w - 5.0784% w / w and had a final pH value between 3.0-3.3. The protein content in sweet soy sauce sorghum seeds ranges from 3.1492% w/w – 4.0760% w/w, and the sugar content of reducing sweet soy sauce sorghum seeds ranges from 1.5439% w/w – 3.0780% w/w.
6. The physical response to the analysis of the viscosity of sweet soy sauce of sorghum seeds shows that the viscosity value of sweet soy sauce of sorghum seeds ranges from 2,744 Cp – 145,200 Cp.
7. Organoleptic response in sweet soy sauce of sorghum seeds with hedonic quality test with attributes of color, aroma, taste and viscosity. The panelist's response showed results on the color attributes of soy sauce, the color of sweet soy sauce is dark brown to very dense, the most popular colors are a3b1 (4.7367) and a3b3 (4.6333) treatment. On the aroma attribute, the sweet soy sauce of sorghum seeds has a characteristic aroma of soy sauce that is neutral to fragrant, the aroma in all treatments does not show a very noticeable difference. In the taste attribute, sorghum seed sweet soy sauce has a slightly sweet to sweet taste, and the sweet soy sauce taste most preferred by panelists is the a3b3 treatment (3.8433). In the viscosity attribute, sorghum seed sweet soy sauce has a rather thick to very thick texture, and the soy sauce whose viscosity is most in demand by consumers is the a3b3 treatment (4.7667) with a viscosity value of 72,545 Cp.

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Effect of Yeast Concentration and Moromi Fermentation During toward The Characteristics of Sorghum Grain Sweet Soy Sauce

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