



Workshop on

Microbe Masters:

Integrating STEM Learning and Entrepreneurship through Food Fermentation

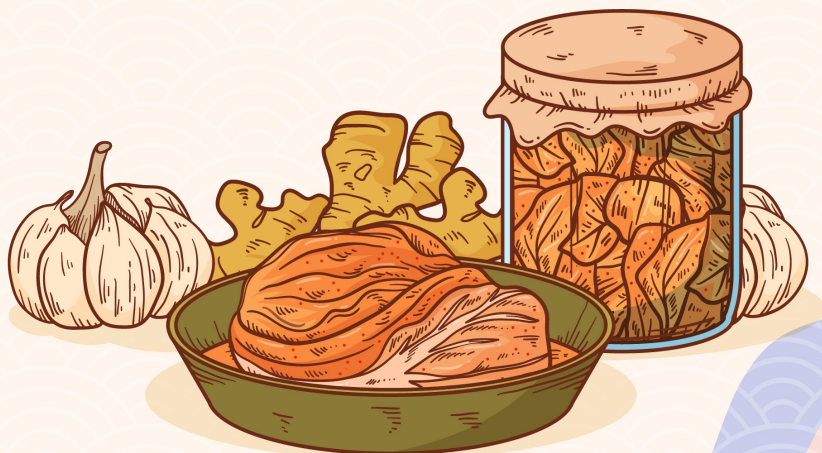
7 & 8 October 2026

SEAMEO Hall, SEAMEO RECSAM, Penang, Malaysia

Workshop Facilitator:



Mr. Ahmad Adnan bin Mohd. Shukri
Science Education Specialist
SEAMEO RECSAM, Penang



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INTRODUCTION

Food fermentation is far more than an ancient method of preservation. It is a living, breathing laboratory where biology, chemistry, technology, and business intersect. This highly interactive 2-day workshop is specially designed for primary and secondary school teachers, as well as food enthusiasts, to demonstrate how everyday ferments specifically **fruit enzyme tonics**, **tepache**, and **kimchi** can be transformed into powerful classroom teaching aids. By shifting from traditional textbook rote learning to a hands-on Science, Technology, Engineering, and Mathematics (STEM) approach, participants will discover how to teach complex concepts like anaerobic respiration, microbial ecosystems, and biochemical pH shifts through food. Crucially, the workshop weaves in a vibrant entrepreneurial thread, teaching educators how to guide students in branding, calculating food costing, safety scaling, and marketing their sustainable creations. It bridges the gap between scientific inquiry and real-world commercial viability.

OBJECTIVES

The following are the key objectives of the workshop:

1. To equip educators with the scientific principles behind lacto-fermentation, wild yeast carbonation, and acetic acid production using cross-curricular STEM framework.
2. To introduce baseline entrepreneurial concepts including costing, safe shelf-life scaling, sustainable raw material sourcing, and product marketing.
3. To provide teachers with scalable, low-cost lesson templates that can be easily integrated into primary and secondary school curricula.
4. To build confidence in safe home or classroom fermentation techniques through rigorous safety protocols, troubleshooting, and sensory evaluation.

TARGETED WORKSHOP PARTICIPANTS

- Primary and secondary school teachers (Science, Biology, Chemistry, Reka Bentuk & Teknologi)
- STEM Club Coordinators
- Community educators
- Individuals interested in food science entrepreneurship

DATE

7 & 8 October 2026 (Wednesday & Thursday)

VENUE

SEAMEO Hall, SEAMEO RECSAM, Penang

WORKSHOP FACILITATOR

Mr. Ahmad Adnan bin Mohd. Shukri
Science Education Specialist, SEAMEO RECSAM

TENTATIVE SCHEDULE OF ACTIVITIES

Day 1 (Wednesday, 7 October 2026)	
0800 – 0830	Registration
0830 – 0840	Opening Session
0840 – 1030	Session 1 on The Invisible Ecosystem: Exploring Microbial Worlds as a Foundation for Fermentation Science
1030 – 1100	Group Photo & Tea Break
1100 – 1300	Session 2 on Fruit Enzyme Tonic: Hands-on Fermentation Activity to Demonstrate Biochemical Processes
1300 – 1430	Lunch Break
1430 – 1630	Session 3 on Tepache: Introducing Traditional Mexican Fermentation and its STEM Relevance
Day 2 (Thursday, 8 October 2026)	
0800 – 0830	Recap and Reflection of Day 1
0830 – 0930	Session 4 on Kimchi (Part 1): Preparation and Fermentation Stages
0930 – 1000	Tea Break
1000 – 1030	Session 5 on The Business of Probiotics
1030 – 1300	Session 6 on Kimchi (Part 2): Making Malaysian-style Kimchi Paste
1300 – 1430	Lunch break
1430 – 1500	Session 7 on Kimchi (Part 3): Finalisation of Kimchi Preparation
1500 – 1600	Session 8 on Probiotics in STEM Classroom: Bridging Fermentation Science with Teaching Strategies
1600 - 1630	Reflections and Conclusion
1630	Closing Ceremony

Bonus Content!

Trimchi

Note: This programme schedule may be subjected to changes without prior notice

REGISTRATION FEE

The registration fee of this two-day workshop is **RM 150.00** per person. The fee covers workshop notes and modules as well as raw materials used in hands-on activities, a workshop certificate and meals comprising of morning tea and lunch throughout the workshop. To register, please visit <https://forms.gle/3xpowMYs9bpbeFRQ6> or scan the QR code (deadline for registration is **2 October 2026**)



SCAN TO REGISTER!

INTRODUCING THE FACILITATOR



Mr. Ahmad Adnan bin Mohd. Shukri is a Specialist in Training and Research (Science Education) at SEAMEO RECSAM, Penang, where he began his service in late February 2026. He holds a Bachelor of Teaching (Primary Science Education) from IPG Kampus Dato' Razali Ismail, Kuala Terengganu (2014), and subsequently earned a Master of Education (Biology Education – Research Mode) from Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak (2020). He is currently a final-year doctoral candidate in Science Education at Universiti Sains Malaysia, Penang. His doctoral research focuses on the development of a STEM-integrated

learning kit within a modified challenge-based learning framework, examining its effectiveness in enhancing computational thinking skills, critical thinking skills, and critical thinking dispositions among lower secondary students. Mr. Adnan's expertise lies in STEM education for inclusive learners, challenge-based learning, critical thinking skills and dispositions, and creative thinking skills and styles. He is actively engaged in producing diverse STEM-based teaching and learning innovations, serving as an innovation judge at various levels including international platforms, and contributing as a speaker and trainer in STEM and science education. He brings with him a decade of teaching experience in science education, notably in Orang Asli schools among the Jahai community at SK Sungai Tiang, Royal Belum Rainforest, Gerik, Perak (2015 – 2024). He later served at SK Kuak Luar and SK Keroh, Pengkalan Hulu, Perak (2025), before joining SEAMEO RECSAM. His dedication as an educator has been recognized through numerous awards, including the *Anugerah Guru Inovatif Sekolah Rendah Negeri Perak* (2021), *Ikon Guru STEM Negeri Perak* (2022), and *Juara Anugerah Khas Pendidikan: Guru Gigih Pedalaman Peringkat Kebangsaan* (2023). At SEAMEO RECSAM, Mr. Adnan contributes as a trainer in the Artificial Intelligence (AI) Skills Empowerment for Malaysian Rural School Teachers program, a collaboration between the Ministry of Education, SEAMEO RECSAM, and UNESCO INRULED. He is also conducting policy research entitled "*Developing and Validating the Orang Asli-based Four-Tier Primary Science Process Skills Test (OA-4SPS Test): A Policy Instrument for Inclusive and Equitable Science Education in Malaysia.*"

FOR ENQUIRIES

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