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**Effect of Lactobacillus pentosus A8 and Lactobacillus fermentum B3 Isolated From Bamboo Shoot (Bambu**

AUTHOR

**Lindayani**

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**Effect of *Lactobacillus pentosus* A8 and  
*Lactobacillus fermentum* B3 Isolated From  
Bamboo Shoot (*Bambusa vulgaris*) Pickle on  
Probiotic Fermented Milk for Health Benefits**

**Lindayani, Laksmi Hartajanie, Monika Palupi M., Sumardi,  
Devi Wulansari, Rika Sebtiana kristantri,  
Email: [lindayani@unika.ac.id](mailto:lindayani@unika.ac.id)**

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# Roadmap of Research



# Aim of research

The aim of the research was to determine the effect of fermented milk containing *Lactobacillus pentosus* A8 and *Lactobacillus fermentum* B3 on blood glucose and cholesterol in Sprague Dawley rat with T2DM (*in vivo*).

# Benefits of Bamboo Shoots

Organic  Facts

Aids in  
weight loss

Reduces risk  
of cancer

Strengthens  
immune system

Helps improve  
heart health

Useful in  
curing snake and  
scorpion bites

Effective  
against respiratory  
diseases



[www.organicfacts.net](http://www.organicfacts.net)

<https://www.organicfacts.net/health-benefits/other/health-benefits-of-bamboo-shoots.html>



Phytosterols

Phytonutrients



dissolving harmful  
**Low-density  
Lipoprotein (LDL)  
cholesterol in the  
body.** This eases  
cholesterol out of  
arteries for the  
smooth supply and  
movement of blood  
throughout the  
body.

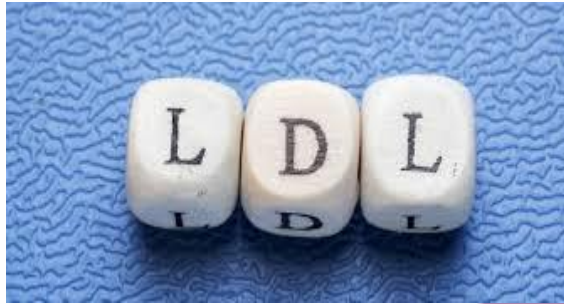
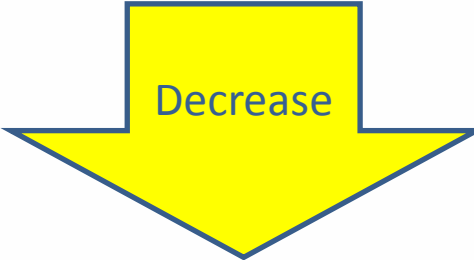
3

➤ Consumption of bamboo shoots is also helpful in **decreasing LDL levels of cholesterol, with stable glucose levels.**

This is due to the fact that bamboo shoots contain negligible amounts of fat and very low calories.

➤ Research conducted by Park and Jhon at Washington State University showed that the consumption of bamboo shoots had favorable effects on cholesterol, lipids and bowel function.

Stable  
Glucose  
Level



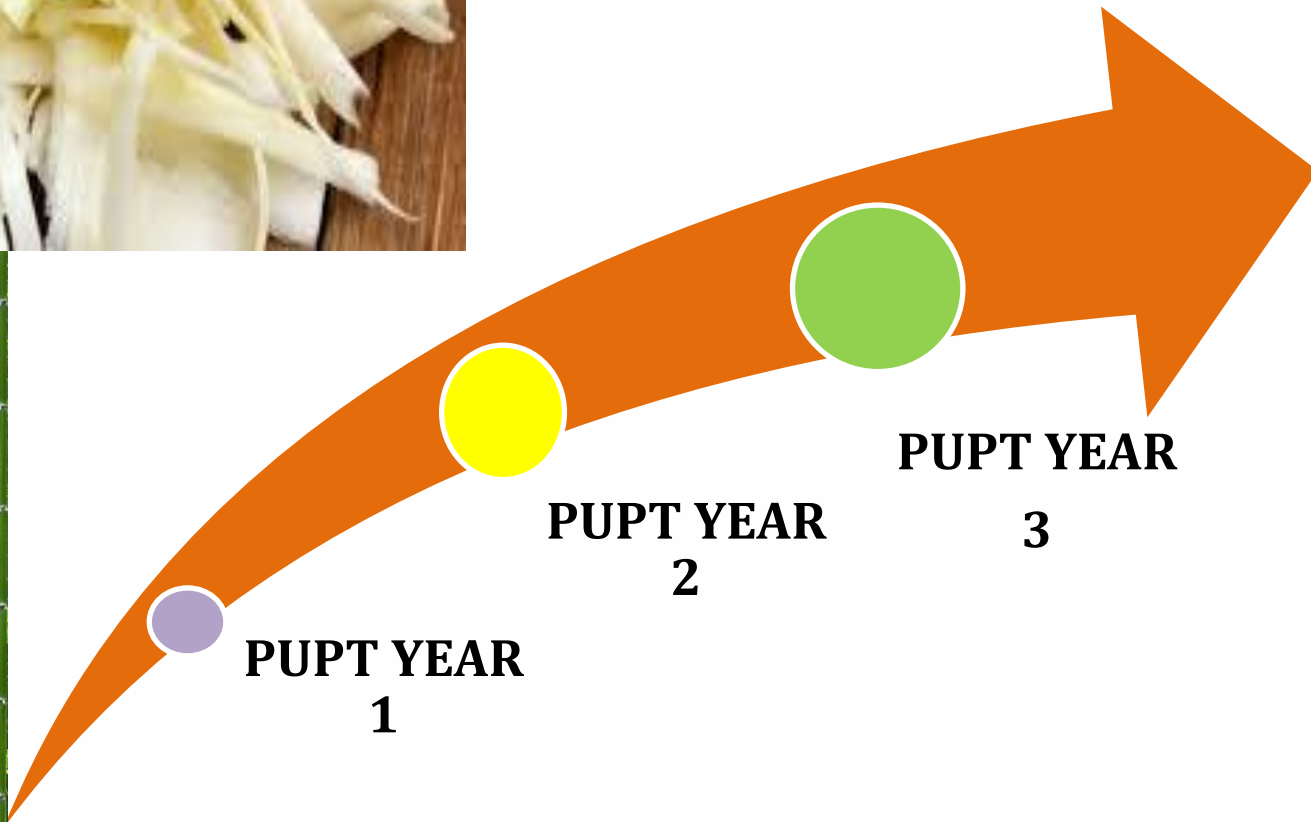


5 **The vitamins and minerals in bamboo shoots are ideal for improving the body's immune system.** The vitamins, minerals, and antioxidants present in bamboo shoots are essential for strengthening the body from inside-out.





Bamboo-groove.com



9<sup>th</sup> ISISM (14-15 of Nov 2017)



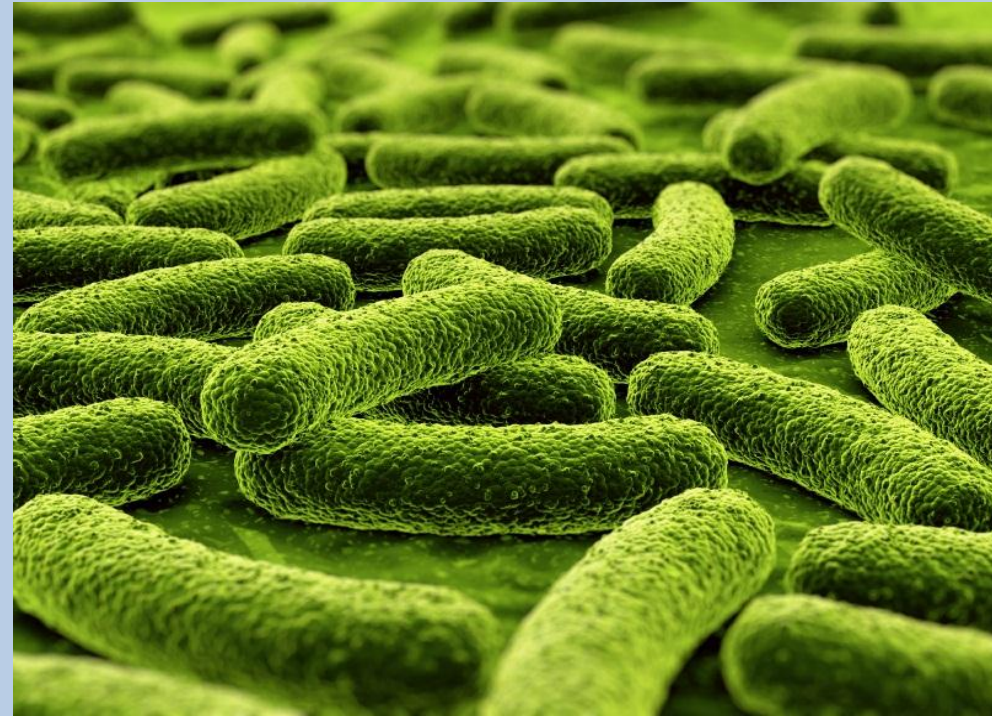
**Year 1:** Based on morphology and physiology analysis, isolates have genus characteristics such as *Lactobacillus* and *Sterptococcus*. Both of them potential as probiotic.

**Year 2:** Bacteriocin producing LAB from bamboo shoot pickle which fermented in : 2.5% of salt concentration at 15°C (A) and 5.0% of salt concentration at 30°C (B) were able to show the bacteriocin inhibitory activity against pathogenic bacteria when cultured in MRS-B supplemented with sucrose or combination of sucrose and nitrogen source.

**Year 3:** Fermented milk using lactic acid bacteria isolates from bamboo shoot pickles has been promising as probiotics drink.



Photograph adapted from  
Agatha Putri Algustie, 2017



NutraIngredients-USA.com

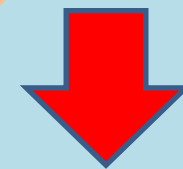
Result of API Software Identification (24 hours  
Incubation): *Lactobacillus fermentum* (99.8%, B) and  
*Lactobacillus pentosus* (97.3%, A)

Yellow Bamboo shoot  
pickles

Fermentation: 2.5% of  
salt concentration at  
15°C (A) and 5.0% of  
salt concentration at  
30°C (B)

Potency of  
Probiotic

Sprague dawley



*Lactobacillus pentosus* (A) and  
*Lactobacillus fermentum* (B) → isolates for  
probiotic drink (fermented milk)

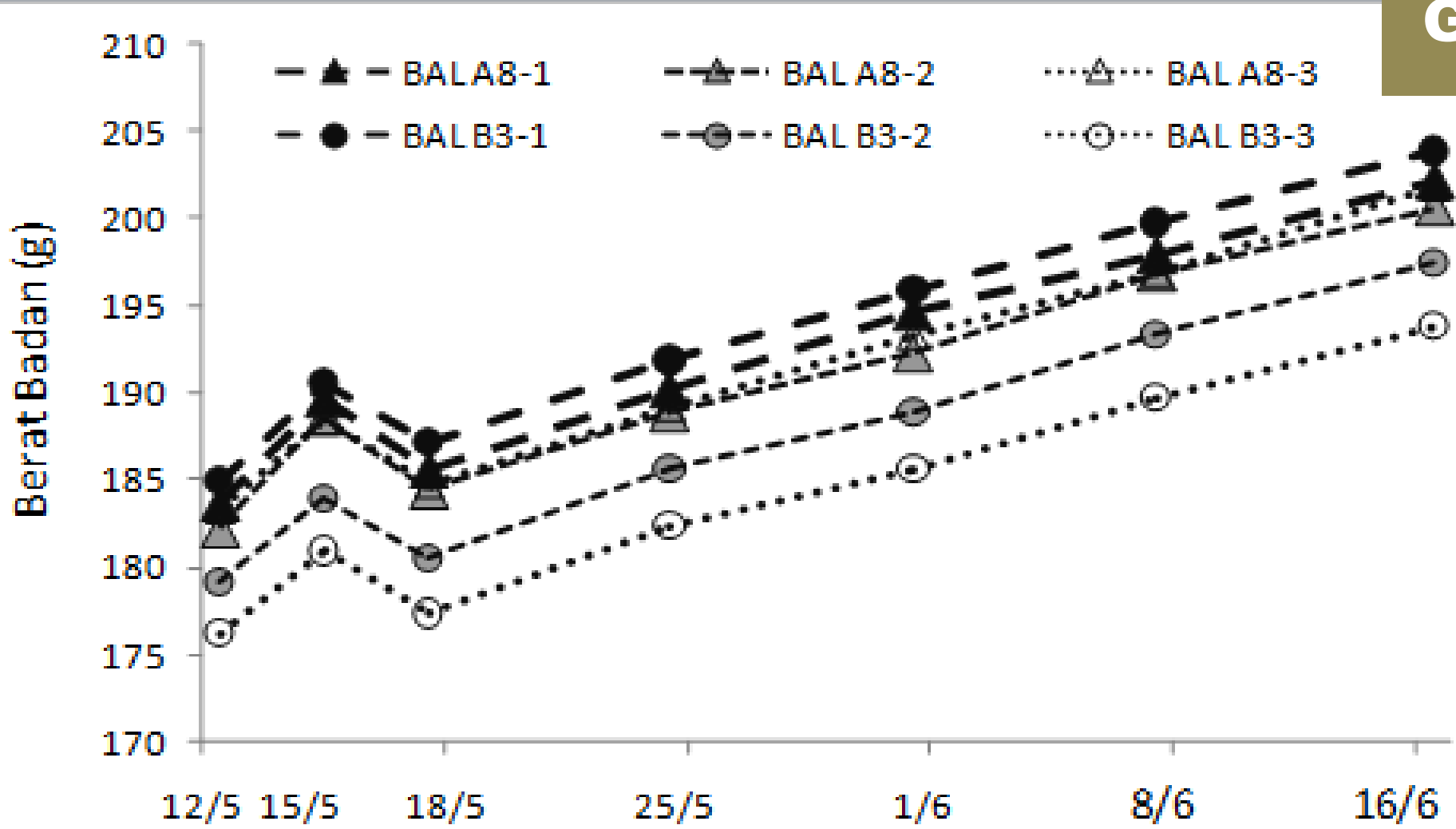
# Variable and code of treatments

<b>Perlakuan</b>	<b>Fungsi</b>	<b>Kode</b>
Normal	Kontrol Positif 1	Krl +1
Induksi <sup>4</sup> STZ 60 mg / Kg, Na 120 mg / Kg	Kontrol Negatif	Krl -
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde Komersial 3,6 ml	Kontrol Positif 2	Krl + 2
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde A8.1	BAL A8-1	BAL A8-1
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde A8.2	BAL A8-2	BAL A8-2
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde A8.3	BAL A8-3	BAL A8-3
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde B3.1	BAL B3-1	BAL B3-1
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde B3.2	BAL B3-2	BAL B3-2
Induksi STZ 60 mg / Kg, Na 120 mg / Kg → Sonde B3.3	BAL B3-3	BAL B3-3

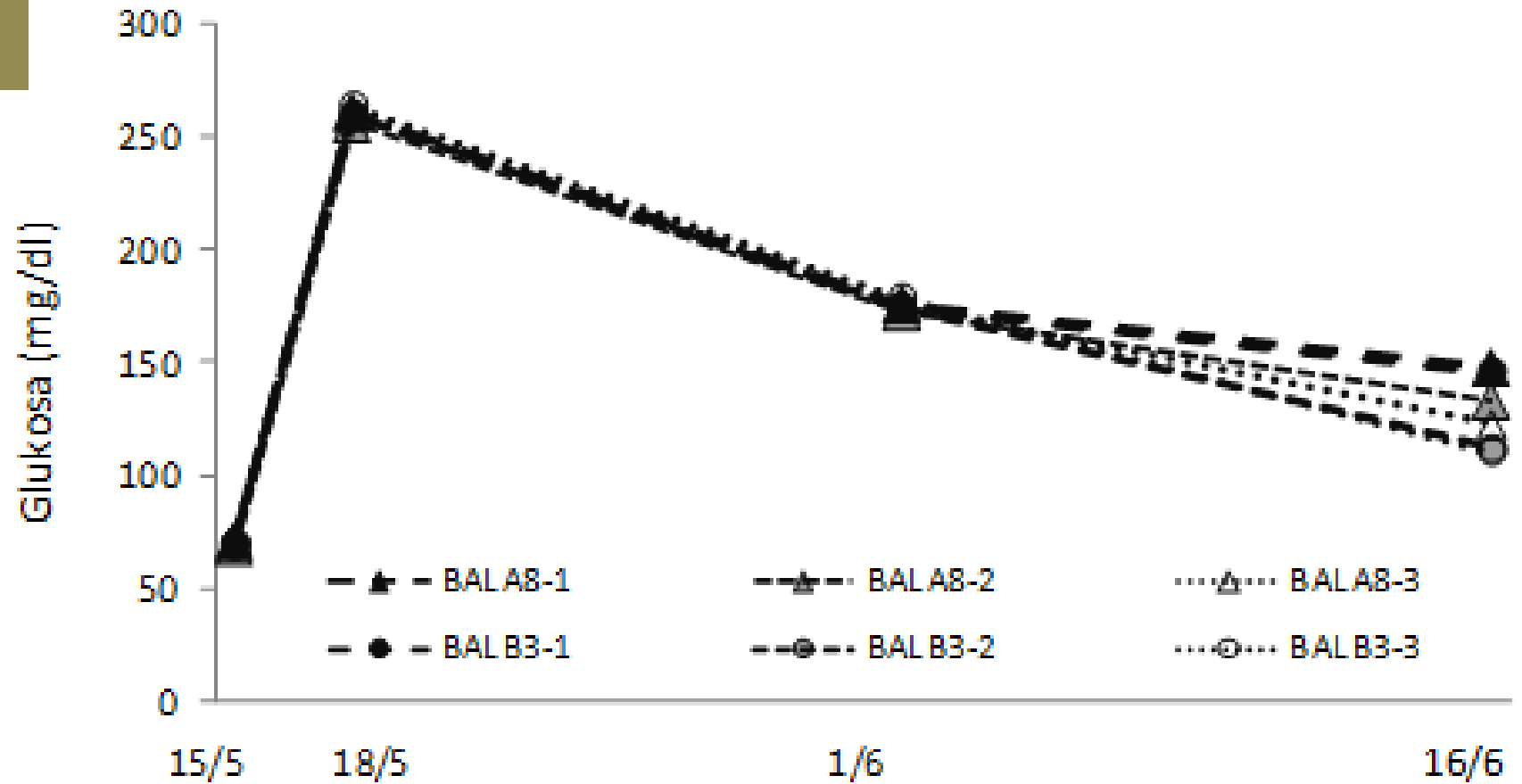
9<sup>th</sup> ISISM (14-15 of Nov 2017)

Body weight of sprague dawley (g) before and after induction with STZ 60 mg/Kg, Na 120 mg/Kg from 15 of May 2017 to 16 of June 2017 for each treatment fermented milk with *Lactobacillus fermentum* (B3) and *Lactobacillus pentosus* (A8)

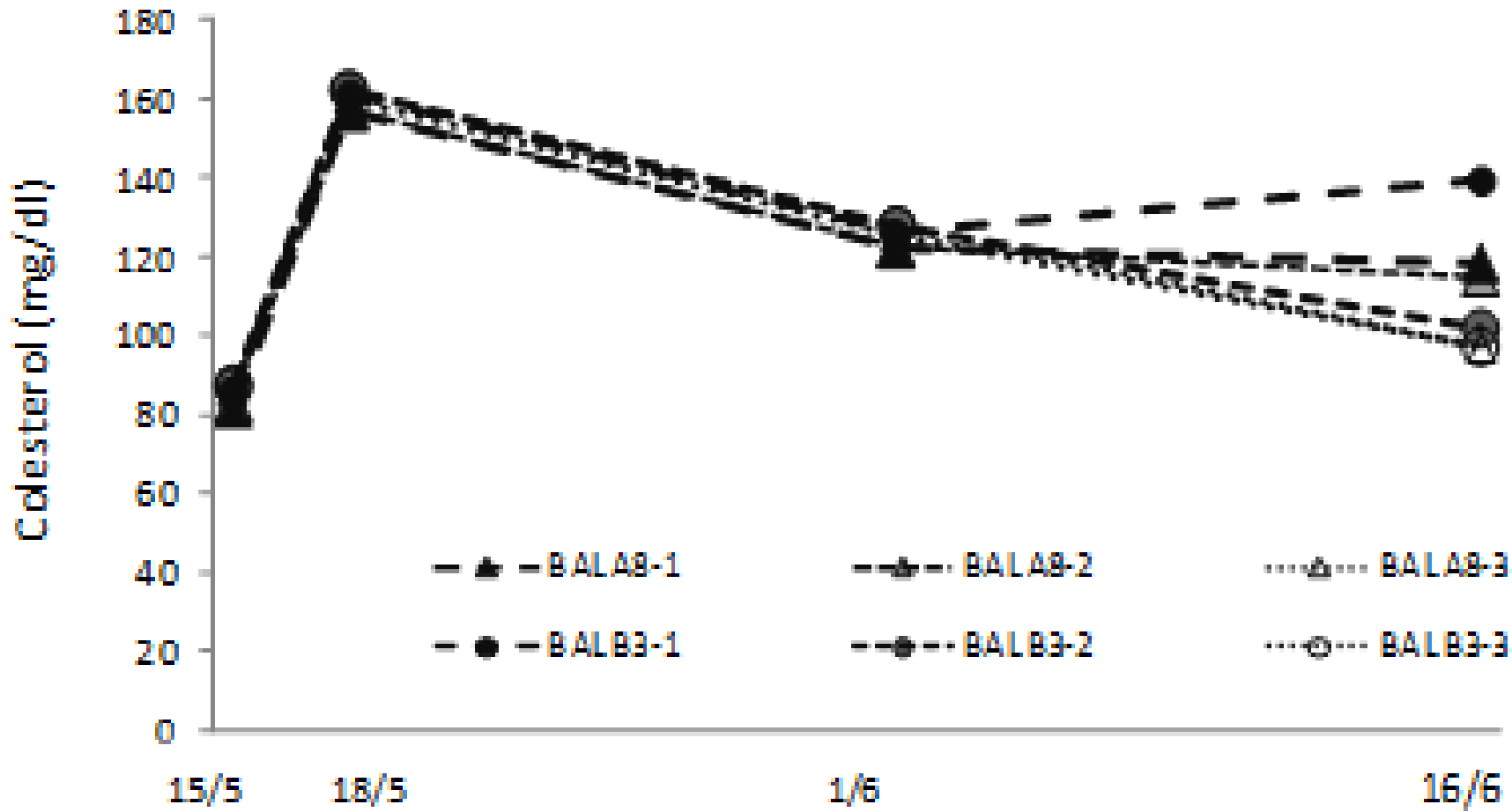
# Graph 1



# Graph 2



Blood glucose of sprague dawley (mg/dL) induction with STZ 60 mg/Kg, Na 120 mg/Kg and the progress after two and four weeks treatments with treatment fermented milk with *Lactobacillus fermentum* (B3) and *Lactobacillus pentosus* (A8)



Total cholesterol of sprague dawley (mg/dL) induction with STZ 60 mg/Kg, Na 120 mg/Kg and the progress after two and four weeks treatments with treatment fermented milk with *Lactobacillus fermentum* (B3) and *Lactobacillus pentosus* (A8)

## Graph 3

9<sup>th</sup> ISISM (14-15 of Nov 2017)





In this research also studied on business feasibility. Based on break event point analysis of cheese and yoghurt as diversification product from milk fermentation.

No	Quantity	Chesee	Yoghurt
1	Sales	225.000	250.000
2	Fixed Cost	46.870	43.537
3	Variable Cost	150.000	190.000
4	BEP	0,87 kg	44 botol



# The estimation of production 50L milk per day

No	Quantity	Chesee	Yoghurt
1	Sales	1.125.000	1.250.000
2	Fixed Cost	46.870	43.537
3	Variable Cost	750.000	950.000
		328.130	256.463



# CONCLUSION

1. Consumption of probiotic fermented milk in *Sprague Dawley* rats (T2DM) decreased the blood glucose and total cholesterol.
2. Probiotic fermented milk from *Lactobacillus pentosus* A8 and *Lactobacillus fermentum* B3 can be useful in medical nutrition management of diabetic patients as health benefits.
3. Based on break event point analysis of cheese and yoghurt as diversification product from milk fermentation shown as a promising business.

9<sup>th</sup> ISISM (14-15 of Nov 2017)



**Thanks to**

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**Special thanks to our teams:**

**Devi Wulansari,  
Rika Sebtiana kristantri,  
Donna Larissa Khuangga  
Agatha Putri Algustie,  
Agata Apriliana Sun<sup>1</sup>ndoro**

## Research Article



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(www.interscience.wiley.com) DOI 10.1002/jsfa.4034

# Isolation and characterization of lactic acid bacteria from *jiang-sun* (fermented bamboo shoots), a traditional fermented food in Taiwan

Yi-sheng Chen,<sup>a\*†</sup> Hui-chung Wu,<sup>a†</sup> Chia-hua Liu,<sup>a</sup> Hung-chieh Chen<sup>a</sup>  
and Fujitoshi Yanagida<sup>b</sup>

Hindawi Publishing Corporation  
International Scholarly Research Notices  
Volume 2014, Article ID 679073, 17 pages  
<http://dx.doi.org/10.1155/2014/679073>



*Review Article*

## **The Nutritional Facts of Bamboo Shoots and Their Usage as Important Traditional Foods of Northeast India**

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9<sup>th</sup> ISISM (14-15 of Nov 2017)

*Review Article*

# **Fermented Fruits and Vegetables of Asia: A Potential Source of Probiotics**

**Manas Ranjan Swain,<sup>1</sup> Marimuthu Anandharaj,<sup>1</sup>  
Ramesh Chandra Ray,<sup>2</sup> and Rizwana Parveen Rani<sup>3</sup>**

<sup>1</sup> *Department of Biotechnology, Indian Institute of Technology Madras, Chennai, Tamil Nadu 600036, India*

<sup>2</sup> *Centre for Tuber Research Institute, Bhubaneswar, Orissa 751019, India*

<sup>3</sup> *Gandhigram Rural Institute-Deemed University, Gandhigram, Tamil Nadu 624302, India*

**International Food Research Journal 21(6): 2487-2492 (2014)**

Journal homepage: <http://www.ifrj.upm.edu.my>



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**Isolation, identification and characterization of probiotic *Lactobacilli* spp.  
from Tarkhineh**

\*Vasice, A. R., Tabatabaei Yazdi, F., Mortazavi, A. and Edalatian, M. R.

*Department of Food Science and Technology, College of Agriculture, Ferdowsi University of Mashhad,  
Mashhad, Iran*

9<sup>th</sup> ISISM (14-15 of Nov 2017)



Original Article



JYP

# Exploring Indigenous *Lactobacillus* Species from Diverse Niches for Riboflavin Production

Kiran Thakur and Sudhir Kumar Tomar

*Dairy Microbiology, Department, Nutrition National Collection of Dairy Cultures, Dairy Microbiology Division, National Dairy Research Institute, Karnal, Haryana, INDIA-132001.*

Journal of Young Pharmacists Vol 7 • Issue 2 • Apr-Jun 2015

9<sup>th</sup> ISISM (14-15 of Nov 2017)

## **Bacteriocins: Promising Natural Antimicrobials**

**Medine Güllüce<sup>1</sup>, Mehmet Karadayı<sup>1</sup> and Özlem Barış<sup>1</sup>**

<sup>1</sup>Molecular Microbiology Group, Bacteriology and Molecular Biology Research Laboratory, Department of Biology, Atatürk University, 25240 Erzurum, Turkey

Bacteriocins are described as ribosomally synthesized small poly peptides that exert antimicrobial effects against closely or non-closely related bacteria. The major producer group for bacteriocins is lactic acid bacteria (LAB) that contain a great variety of microorganisms described as “generally recognized as safe (GRAS)” by the US Food and Drug Administration. Due to this accredited safety potency of their origin and the wide-range effectiveness on pathogenic or spoilage bacteria, bacteriocins have attracted great research interest as natural antimicrobial agents, thereby allowing the design of new technologies for combating microbial pathogens in many industrial applications. For example, bacteriocins play a crucial role in maintaining the food safety and several bacteriocin preparations are commercially available for wide-range applications in the industry.

On the other hand, although many research efforts have been successfully done up to date, it is remarkable that there are still several gaps in this subject. Filling these gaps fundamentally requires a clear understanding on the nature of bacteriocins and carefully considered research strategies. Thus, the present study will include general information about bacteriocins such as definition, origin, nature and more complicated issues including effect mechanisms, application and development strategies.

**Keywords** bacteriocins; natural antimicrobials; effect mechanism; biopreservative agents



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### Review

## Novel biotechnological applications of bacteriocins: A review

Eduardo Marcos Balciunas<sup>a</sup>, Fabio Andres Castillo Martinez<sup>a</sup>, Svetoslav Dimitrov Todorov<sup>b</sup>,  
Bernadette Dora Gombossy de Melo Franco<sup>b</sup>, Attilio Converti<sup>c</sup>, Ricardo Pinheiro de Souza Oliveira<sup>a,\*</sup>

<sup>a</sup> Biochemical and Pharmaceutical Technology Department, Faculty of Pharmaceutical Sciences, University of São Paulo, Av Professor Lineu Prestes 580, São Paulo 05508-900, Brazil

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<sup>c</sup> Department of Chemical and Process Engineering, Genoa University, Genoa I-16145, Italy



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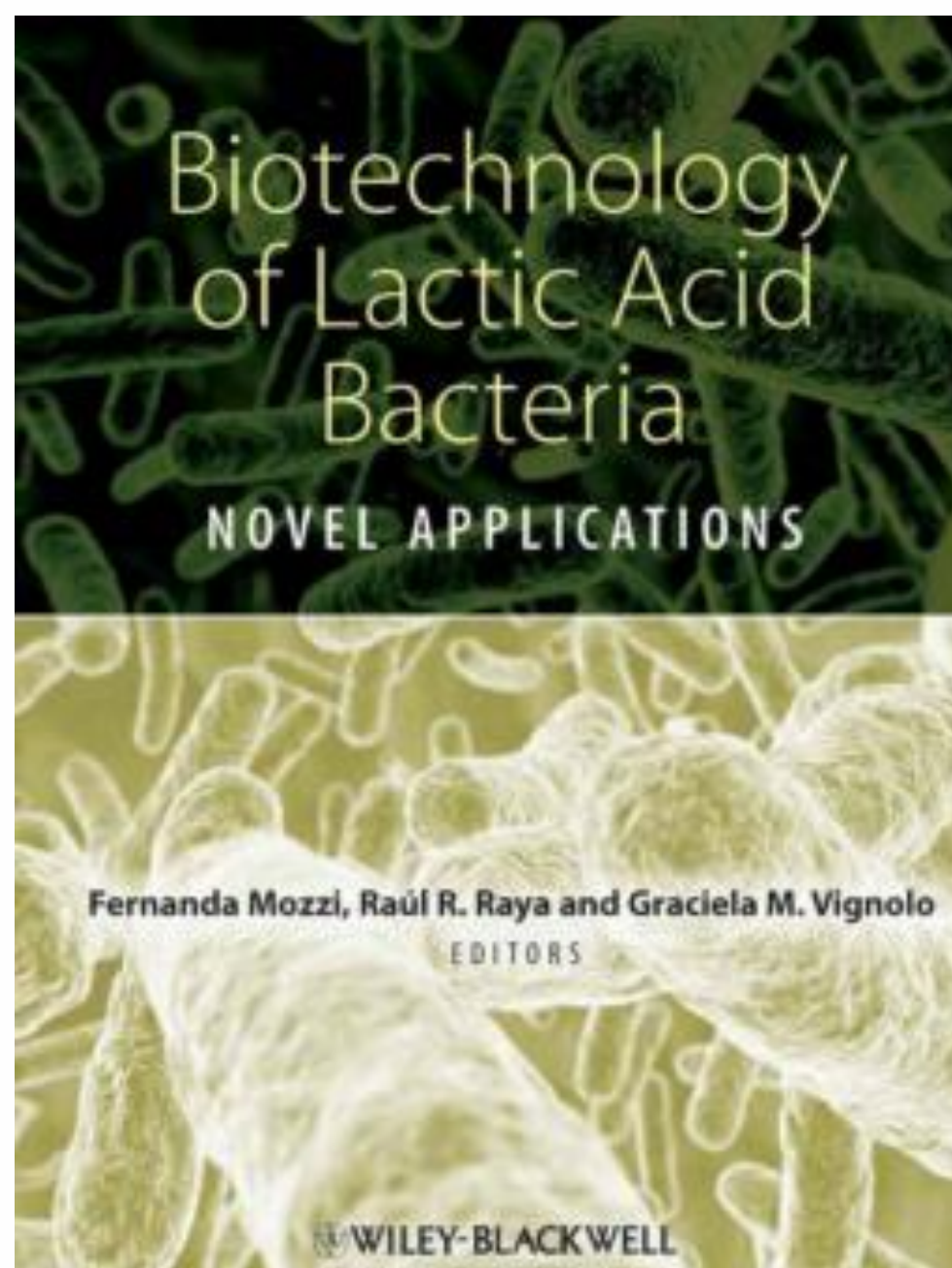


### Lactic acid bacteria in dairy food: Surface characterization and interactions with food matrix components

J. Burgain <sup>a</sup>, J. Scher <sup>a</sup>, G. Francius <sup>b</sup>, F. Borges <sup>a</sup>, M. Corgneau <sup>a</sup>, A.M. Revol-Junelles <sup>a</sup>,  
C. Cailliez-Grimal <sup>a</sup>, C. Gaiani <sup>a,\*</sup>

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9<sup>th</sup> ISISM (14-15 of Nov 2017)

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