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Potential Of Ampel Bamboo Shoots (*Bambusa vulgaris*) Picle "*Lactobacillus fermentum* LLB3" and "*Lactobacillus pentosus* LLA18" As A Starter For Mozzarella Cheese And Beverage

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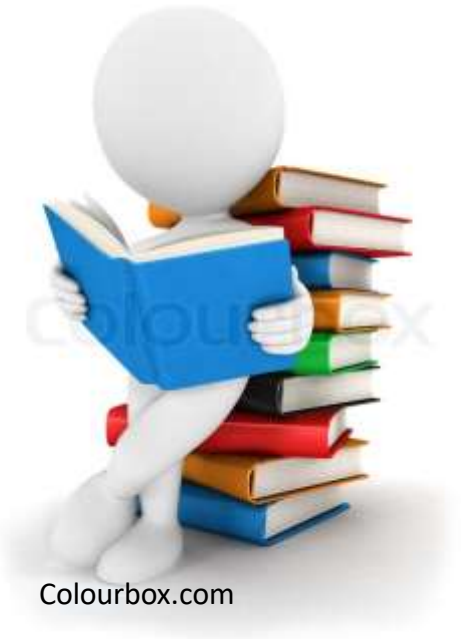
3 https://www.organicfacts.net/health-benefits/other/health-benefits-of-bamboo-shoots.html

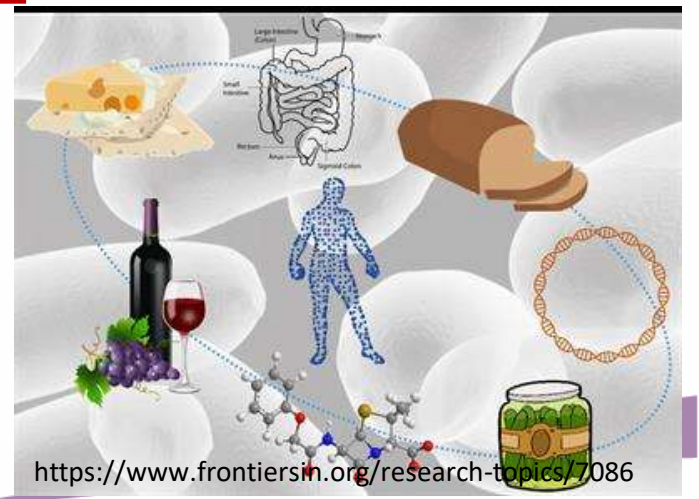
Background

Based on previous research, it is known that the results of lactic acid bacteria isolate from Ampel bamboo shoots (*Bambusa vulgaris*) pickled has been promising as probiotic and ability to produce bacteriocins as natural antimicrobial compound. After obtaining lactic acid bacteria that have potential as probiotics, the research was tested on *Sprague Dawley* rats (T2DM). After Consumption of probiotic fermented milk in *Sprague Dawley* rats (T2DM) decreased the blood glucose and total cholesterol.



Colourbox.com

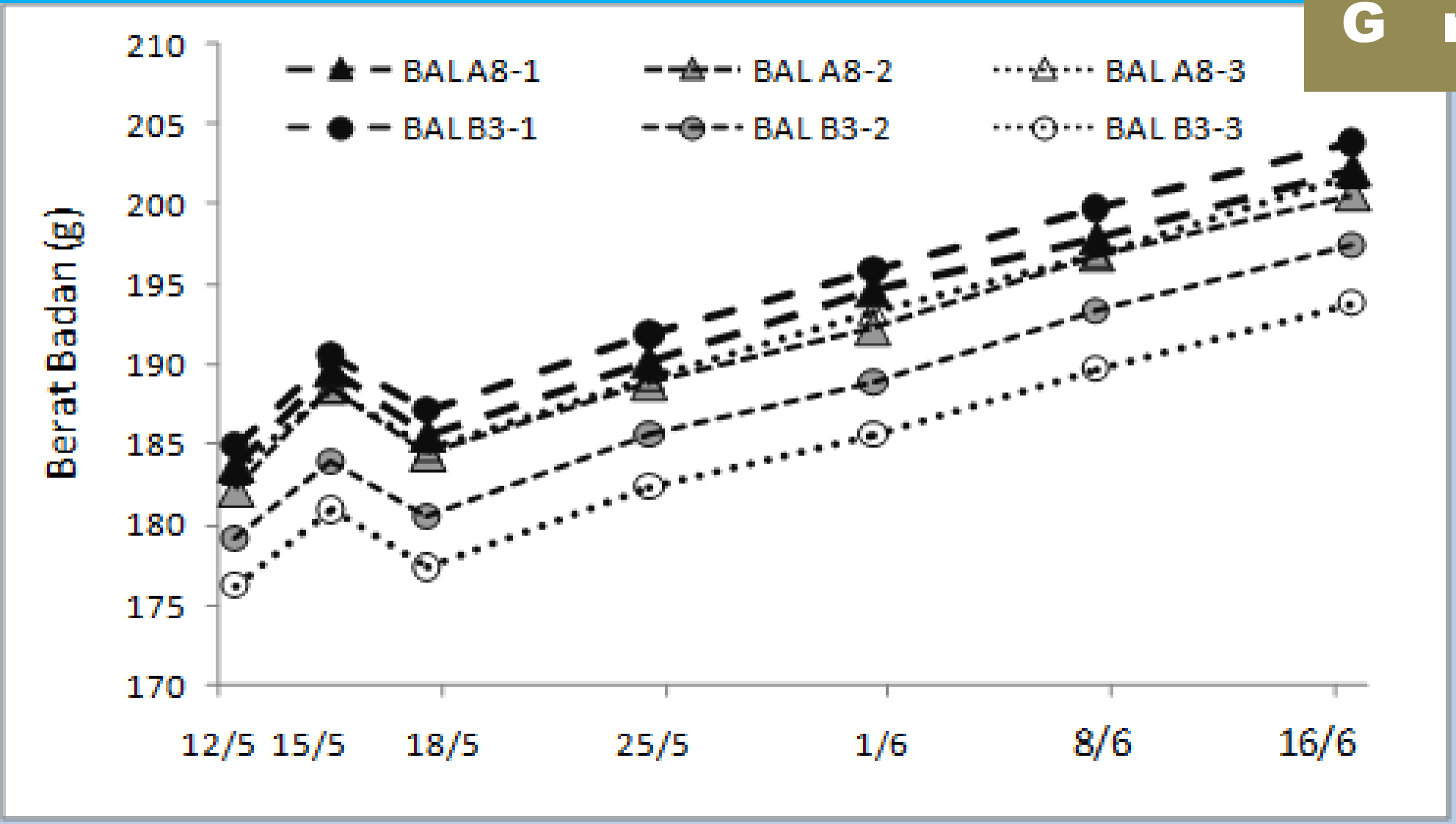
To date, several studies which showed that the isolation of lactic acid bacteria from Ampel bamboo shoots (*Bambusa vulgaris*) pickled had the opportunity to be used as a starter in the food processing process, then conducted research as a starter in making mozzarella cheese using *Lactobacillus fermentum* LLB3 and probiotic drinks from duwet (*Syzygium cumini)* fruit extract which was fermented with *Lactobacillus pentosus* LLA18.



https://www.frontiersin.org/research-topics/7086

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)

G r a p h 1



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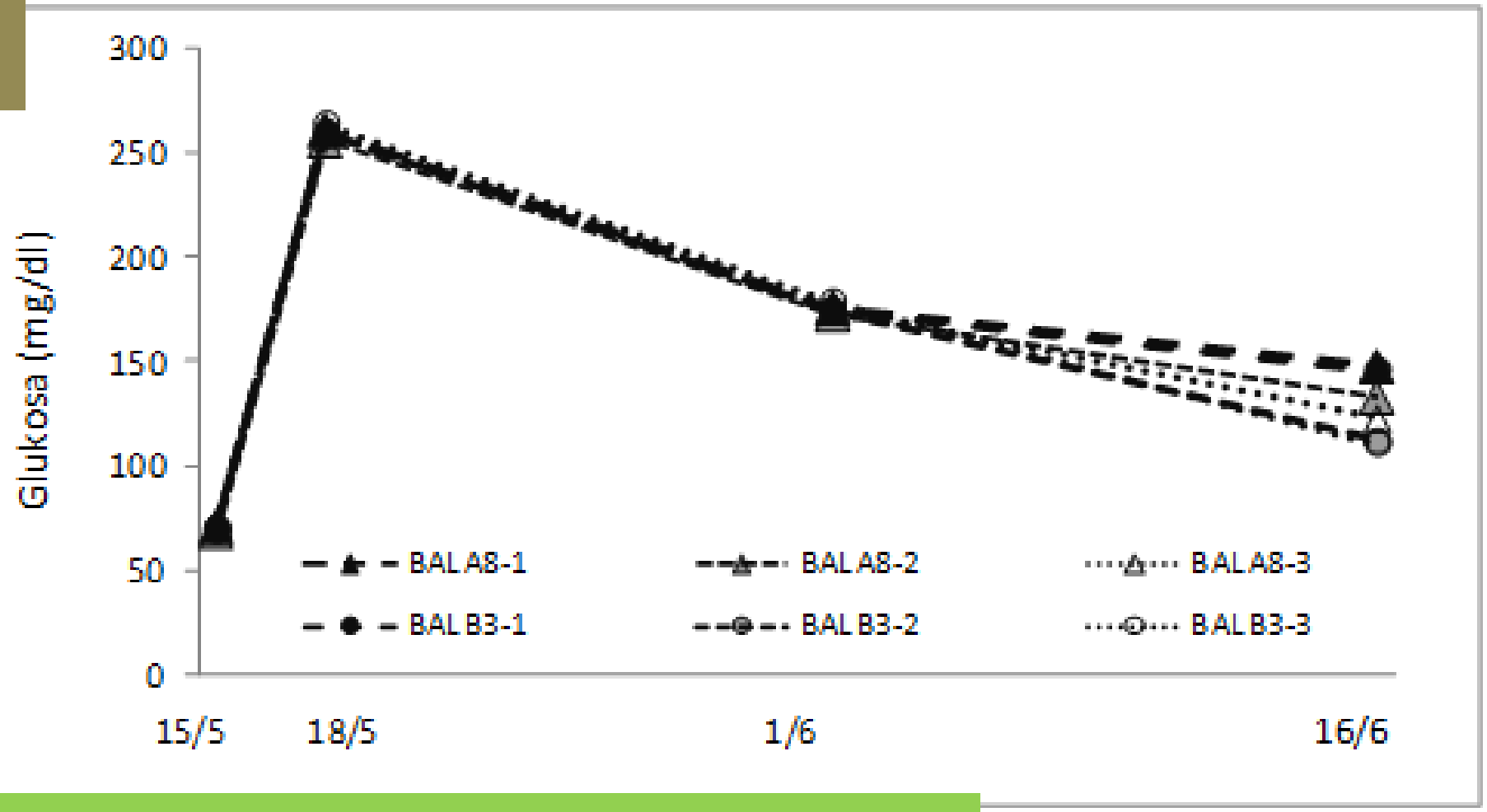
Graph 2



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)

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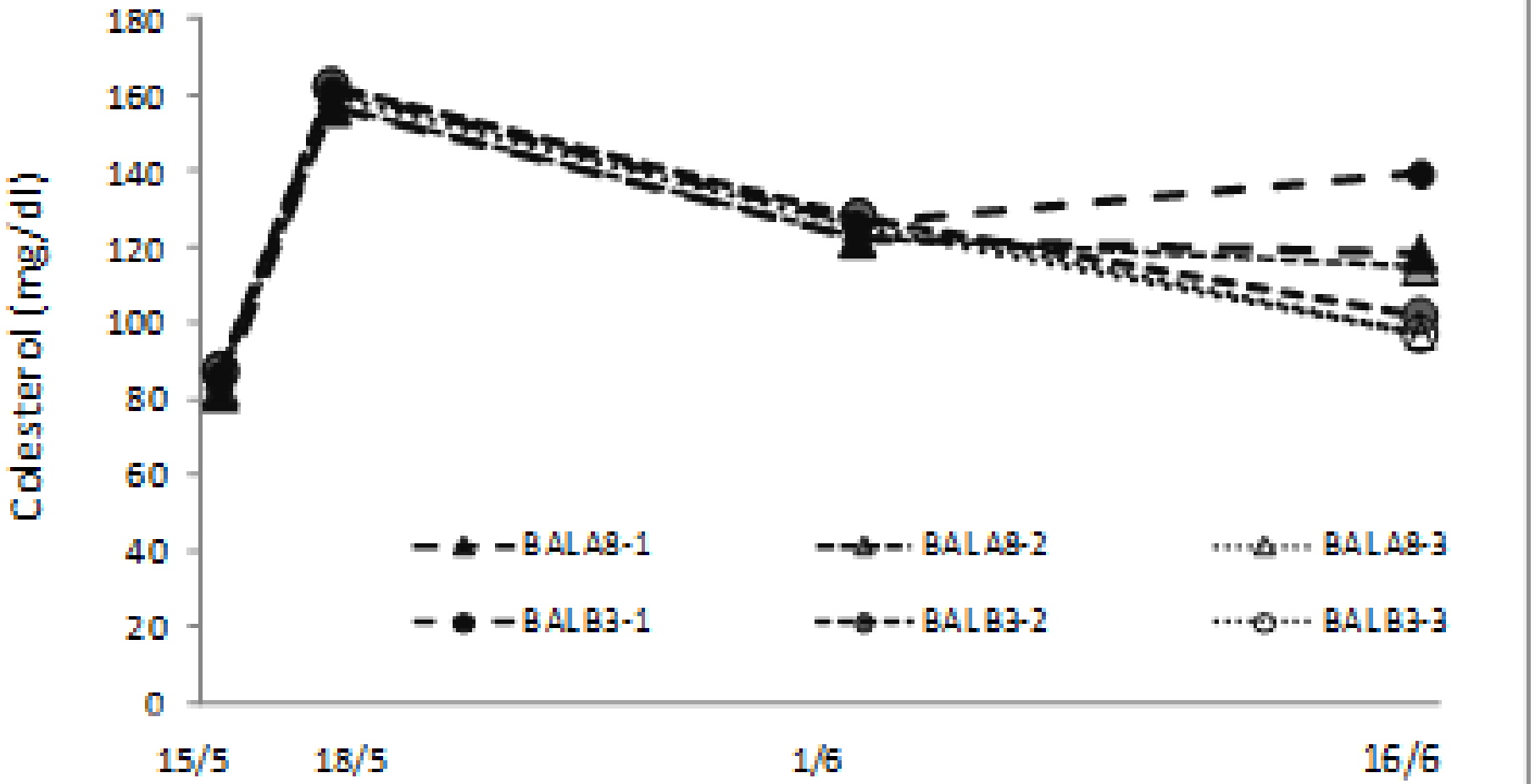

Total cholesterol of sprague dawley (mg/dL) induction with STZ 60 mg/Kg, Na 120 mg/Kg and the progress after two and four weeks treatments with treatment fermented milk with l*actobacillus fermentum* (B3) and *Lactobacillus pentosus* (A8)

G r a p h 3

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Related publication on our project

MICROBIOLOGY INDONESIA
ISSN 1978-3477, eISSN 2087-8575
Vol.12, No.1, March 2018, p 7-14

Available online at
http://jurnal.permi.or.id/index.php/mioline
DOI: 10.5454/mi.12.1.2

The Effect of Carbon and Nitrogen Supplementation on Bacteriocin Production of Lactic Acid Bacteria from Pickled Yellow Bamboo Shoots (*Dendrocalamus Asper*)

LAKSMI HARTAJANIE*, LINDAYANI, AND LORENTIA SANTOSO

UNIKA Soegijapranata, Jalan Pawiyatan Luhur IV/1, Semarang 50234, Indonesia

Six selected lactic acid bacteria (LAB) isolates from pickled Yellow Betung bamboo shoots were grow
the Mann Rogosa Sharpe-Broth (MRSB) media with different supplementation combination. The cell-
supernatant were evaluated for their ability to produce bacteriocin by adjusting its pH to 6.0 in order to ren
organic acid effects. The bacteriocin activity was assayed by agar-well diffusion method. The inhibitory act
calculated in Activity Unit (AU in mm^2 mL^{-1}) of bacteriocins. The aims of this paper is to explore the effe
different medium compositions on bacteriocin production and its inhibitory activity against pathogenic bac
(*Listeria monocytogenes* FNCC 0156, *Staphylococcus aureus* FNCC 0047, and *Escherichia coli* FNCC 0

MICROBIOLOGY INDONESIA
ISSN 1978-3477, eISSN 2087-8575
Vol.12, No.1, March 2018, p 30-34

Available online at
http://jurnal.permi.or.id/index.php/mioline
DOI: 10.5454/mi.12.1.5

SHORT COMMUNICATION

Probiotic Potential of Lactic Acid Bacteria from Yellow Bamboo Shoot Fermentation using 2.5% and 5% Brine at Room Temperature

LINDAYANI*, LAKSMI HARTAJANIE, AND MONIKA PALUPI MURNIATI

UNIKA Soegijapranata, Jalan Pawiyatan Luhur IV/1, Semarang 50234, Indonesia

Yellow bamboo shoot is a popular food material especially in Semarang because it is used as filling for *lumpia* (authentic food of Semarang). Beside used as filling, yellow bamboo shoot commonly known by Indonesian people. Considering bamboo shoot often processed into fermented traditional food, yellow bamboo shoot also potential to be examined as source of fermented food producing lactic acid bacteria. Lactic acid bacteria still become the most beneficial microorganisms associated with gastrointestinal system and moreover for obesity diet. The aim of this research is to study the probiotic potential of lactic acid bacteria produced from yellow bamboo shoot fermentation in 2.5% and 5% brine under room temperature (30 °C). From isolation, 22 single colonies obtained from 2.5% brine and 27 isolates obtained from 5% brine. The morphology and physiology analysis resulted in *Lactobacillus* and *Streptococcus* genus. All isolates were tested subsequently for probiotic potential. Based on the result, more than 50% identified isolates have probiotic potential.

Key words: lactic acid bacteria, probiotic, yellow bamboo shoot

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,
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Department of Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University, Semarang

9th ISISM (14-15 of Nov 2017)

MICROBIOLOGY INDONESIA
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Lactobacillus fermentum LLB3 Improves Antioxidant Activity of Bitter Melon (*Momordica charantia*) Juice

LAKSMI HARTAJANIE*, LINDAYANI, ANGELA NOVITA, EMILIA TRIVIANA SUTANTO, AND AGATA APRILIANA SUNDORO

UNIKA Soegijapranata, Jalan Pawiyatan Luhur IV/1, Semarang 50234, Indonesia

lomordica charantia (bitter melon) contains substances with antidiabetic properties such as charantin, :, and polypeptide-p, as well as other unspecific bioactive components such as antioxidants. It is suitable for onal drink and need further studies to elaborate its functional properties. *Lactobacillus fermentum* LLB3 ed from bamboo shoot pickle was used to ferment bitter melon juice. The aim of this study was to evaluate es in antioxidant activity of bitter melon juice during fermentation. Study has been carried out by nting bitter melon juice with *L. fermentum* LLB3. The free radical scavenging activity of the phenolics done using 2,2-diphenyl- 1-picrylhydrazyl (DPPH). Antioxidant activity of bitter melon juice increased g 24 hours fermentation. In addition, the sugar content and pH decreased compared with the baseline value. ermentation of bitter melon juice by *L. fermentum* LLB3 increased its antioxidant activity. These result st that fermented bitter melon juice is a promising agent for diabetes management.

ey words: antioxidant activity, bamboo shoot pickle, bitter melon, diabetes management, *Lactobacillus fermentum* LLB3

BACTERIOLOGY RESEARCH DEVELOPMENTS

The Many Benefits of Lactic Acid Bacteria

Jean Guy LeBlanc
Alejandra de Moreno de LeBlanc
Editors

NOVA

Publication Date: July 2019

Unika SOEGIJAPRANATA

How Success is Like a Chinese Bamboo Tree - Matt Morris

Lactic acid bacteria isolate from Ampel bamboo shoots (*Bambusa vulgaris*) pickled has been promising as probiotic.

Ability to produce bacteriocins as natural antimicrobial compound

2

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

Mozzarella Cheese & non-dairy fermented beverages is a duwet fruit (*Syzygium cumini*)

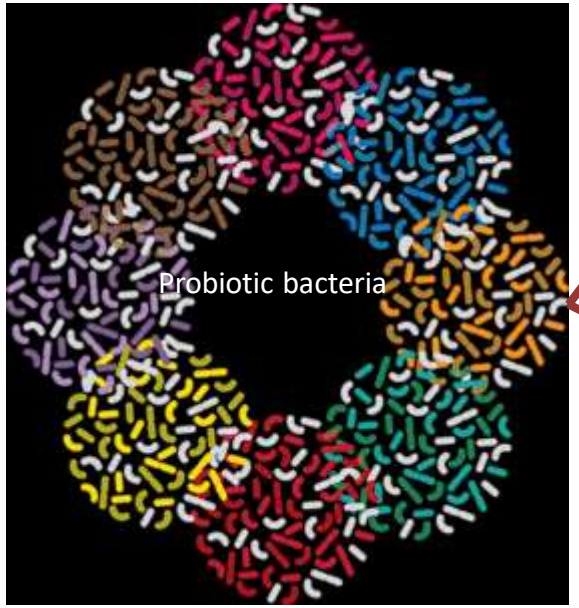
https://tanamanbibit.com/product/jual-bibit-buah-kedondong-murah/

https://www.tanobat.com/jamblang-ciri-tanaman-serta-khasiat-dan-manfaatnya.html

Aim of research

The aim of the research was to to determine the potential of *Lactobacillus fermentum* LLB3 and *Lactobacillus pentosus* LLA18 isolates as a starter for making mozzarella cheese and beverage.

Duwet fruit extract



https://humarian.com/know-your-probiotics-strains-different-strains-do-different-things/

Lactobacillus pentosus LLA18

OPTIMIZATION OF BACTERIOCIN PRODUCTION BY LACTIC ACID BACTERIA ISOLATED FROM AMPEL BAMBOO SHOOTS (*Bambusa vulgaris*) PICKLE UNDER DIFFERENT FERMENTATION CONDITIONS USING SUPPLEMENTED WHEY MEDIUM

OPTIMASI PRODUKSI BAKTERIOSIN BAKTERI ASAM LAKTAT YANG DIISOLASI DARI ACAR REBUNG AMPEL (Bambusa vulgaris) PADA KONDISI FERMENTASI YANG BERBEDA MENGGUNAKAN MEDIA WHEY YANG DISUPLEMENTASI

BACHELOR THESIS

Submitted in partial fulfillment of the requirements for a Food Technology Bachelor's degree in Faculty of Agricultural Technology

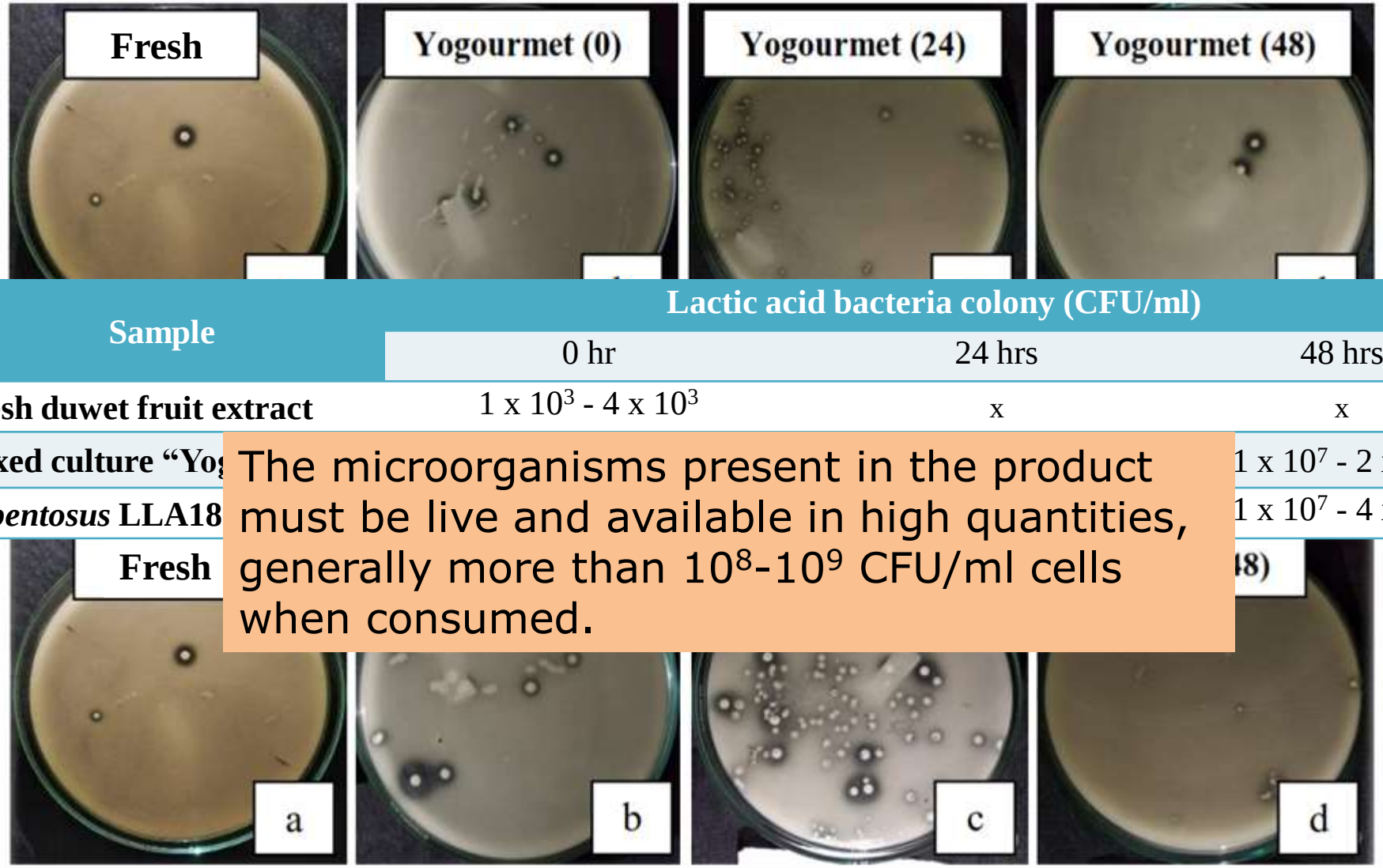
By:

DONNA LARISSA KHUANGGA

13.70.0171

Mixed culture "Yogourmet"

- ***Lactobacillus bulgaricus***
- ***Streptococcus thermophilus***
- ***Lactobacillus acidophilus***



Sample	Lactic acid bacteria colony (CFU/ml)		
	0 hr	24 hrs	48 hrs
Fresh duwet fruit extract	1×10^3 - 4×10^3	x	x
Mixed culture "Yog			1×10^7 - 2×10^7
***L. pentosus* LLA18**			1×10^7 - 4×10^7

The microorganisms present in the product must be live and available in high quantities, generally more than 10^8-10^9 CFU/ml cells when consumed.

Total Plate Count of Fresh Duwet Fruit Extract (a); Fermented Duwet Fruit Extract with *Lactobacillus pentosus* LLA18 0 hours (b); 24 hours (c); and 48 hours (d)

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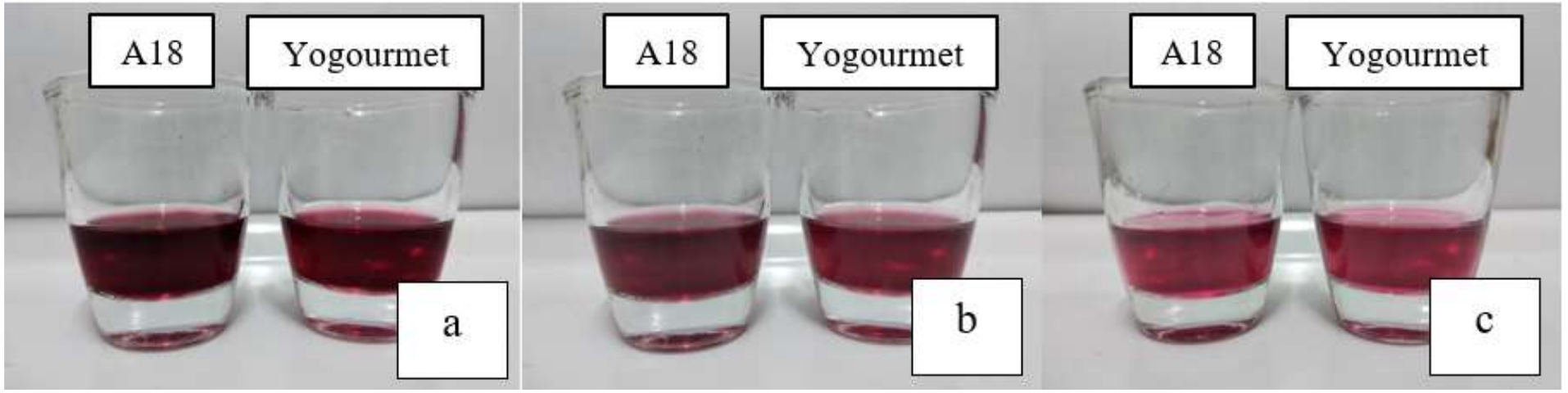
Sample	Antimicrobial activity (mm^2/ml)		
	0 hr	24 hrs	48 hrs
	Fresh duwet fruit extract		
***E. coli* FNCC0091**	5234.82 – 7770.71	x	x
***S. aureus* FNCC0047**	6564.25 – 7597.46	x	x
***S. thypimurium* FNCC0056**	6920.96 – 9969.14	x	x
	Mixed culture "Yogourmet"		
***E. coli* FNCC0091**	4602.71 – 7151.57	3922.29 - 8900.57	8146.68 – 10132.57
***S. aureus* FNCC0047**	7032.54 – 9807.29	6864.00 – 14633.54	6053.14 – 16574.25
***S. thypimurium* FNCC**	3638.25 – 7524.00	2834.46 – 13789.29	4768.89 – 12882.18
	L. pentosus LLA18		
***E. coli* FNCC0091**	7040.00 – 8132.14	5341.29 - 9163.00	8401.25 – 13432.18
***S. aureus* FNCC0047**	9031.39 – 9969.14	6745.75 – 12653.14	8715.14 – 15071.57
***S. thypimurium* FNCC0056**	7770.71 – 9562.54	5828.04 – 11088.00	6618.86 – 11528.00

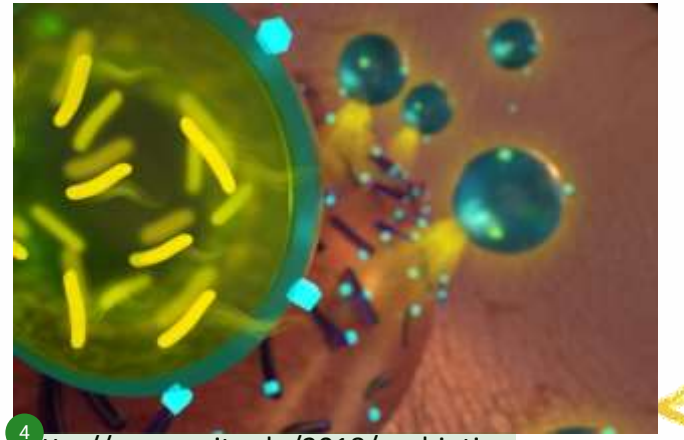
Antimicrobial activity increased



Duwet extract without fermentation (a); Fermentation 24 hrs (b); Fermentation 48 hrs (c)

Sample	Sensory analysis		
	Taste	Flavor	*Overall*
Fresh duwet fruit extract	3,00 ± 1,05	3,20 ± 1,03	3,17 ± 0,95
Mixed culture "Yogourmet"	3,27 ± 1,20	3,27 ± 1,41	3,30 ± 1,18
***L. pentosus* LLA18**	3,40 ± 0,86	3,57 ± 1,01	3,40 ± 1,00

Mozzarella cheese



4 http://news.mit.edu/2018/probiotics-antibiotics-kill-drug-resistant-bacteria-1017

ACIDULANT

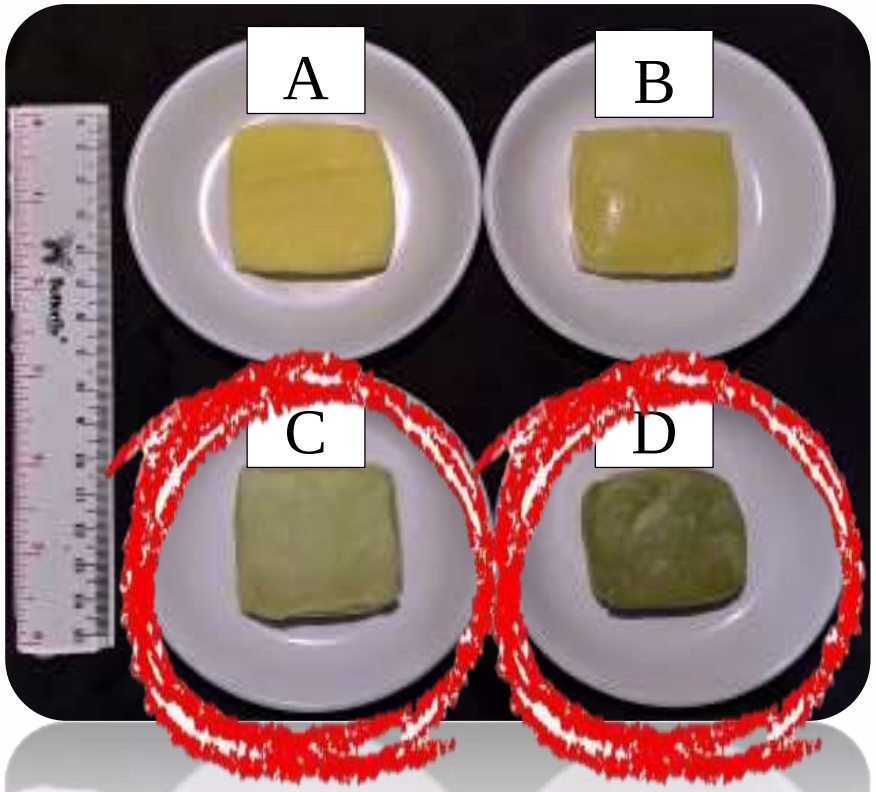
DIRECT ACIDIFICATION

pH 3.17 – 3.43

- Long time
- Difficult to control

- Short time

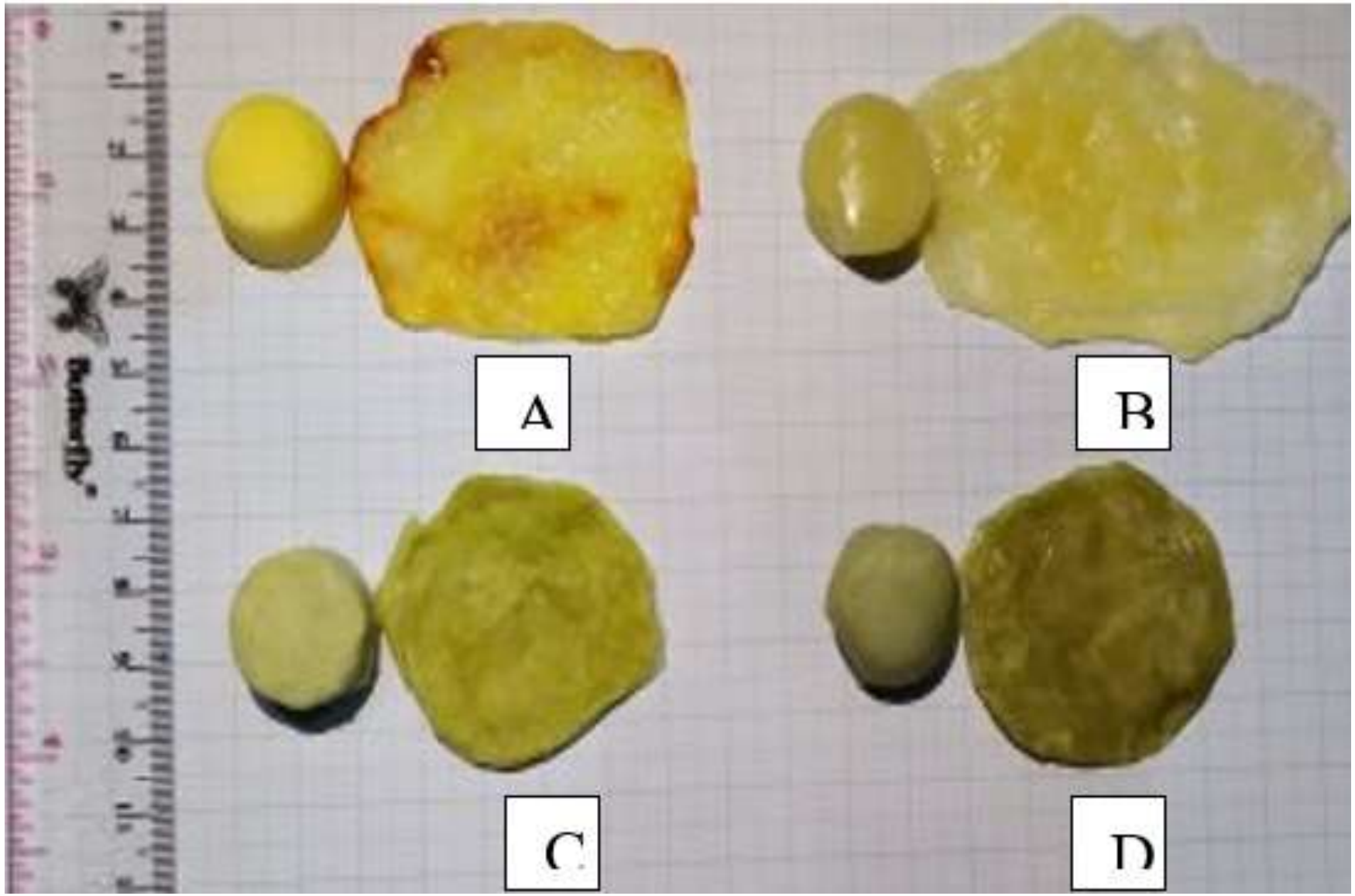
Product of mozzarella cheese



Commercial Mozzarella Cheese (A), Using *L. fermentum* LLB3 (B), Using Concentration *ambarella fruit (Spondias dulcis)*of 5% (C), Concentration *ambarella fruit (Spondias dulcis* of 7.5% (D)

Physical analysis of commercial and treatments mozzarella cheese

Type of analysis.	Treatment			
	Commercial	*L. fermentum* LLB3	Ambarella 5%	Ambarella 7,5%
Rendemen (%)	-	4.11 ± 0.10	4.58 ± 0.12	4,95 ± 0,30
Area (cm^2)				
Before roasting	4.16	4.16	4.16	4.16
After roasting	20,94±0.89	24.10±1.81	13.21±1.87	17.05±2.23
Meltability (%)	403.73±21.32[1]	479.82±43.50 [a2]	217.89 ±44.98 [b3]	289.92 ± 69.06 [c4]
hardness (gf)	745.61 ± 81.63[1]	1301.46±19835[2]	3092.48±521.88[3]	2460.41±178.36[4]
Stretchability (cm)	119.67 ±4.59[1]	142.17±3.76[a2]	114.33 ±3.14[b3]	173.68 ±3.93[c4]



Commercial mozzarella cheese before and after roasting (A), *L. fermentum* LLB3 (B), *ambarella fruit* 5% (C), *ambarella fruit* 7.5% (D)

Sensory analysis

Mozzarella cheese	Attribut			
	Stretch		Taste	Overall
Commercial	3.38 ±		3.33 ± 0.76 [a]	3.49 ± 0.76 [a]
L. Fermentum LLB3	1.83 ±		2.62 ± 0.96 [b]	2.43 ± 0.86 [b]
Ambarella fruit 5%	3.22 ±		2.97 ± 0.97[c]	3.25 ± 0.62[c]
Ambarella fruit 7.5%	2.94 ±		2.52 ± 0.80[b]	2.75 ± 0.67[d]

1. Duwet fruit extract can be used as a *Lactobacillus pentosus* LLA18 fermentation medium in the processing of probiotic drinks. That have 10^8-10^9 CFU/ml.
2. The fermentation process of duwet fruit extract causes a decrease in pH and total sugar during the fermentation time (24 and 48 hours), an increase in antimicrobial inhibitory activity and antioxidant activity in 24 hours fermentation.
3. The results of sensory analysis showed that panelists preferred 24-hour fermented duwet fruit extract rather than fresh duwet fruit extract.
4. Mozzarella cheese with the addition of *L. fermentum* LLB3 in the process of making mozzarella cheese has a higher yield, greater meltability, lower hardness, and stretchability than mozarella cheese with acidulant of ambarella.
5. The addition of ambarella 5% extract is the right concentration for acidulant of mozzarella cheese.
6. Mozzarella cheese produced from ambarella acidulant is more accepted by panelists.
7. The promising of *Lactobacillus fermentum* LLB3 and *Lactobacillus pentosus* LLA18 isolates as a starter for making mozzarella cheese and beverage (duwet fruit extract).

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Rika Sebtiana kristantri,
Lolrentia Santoso,
Donna Larissa Khuangga,
Agatha Putri Algustie,
Agata Apriliana Sundoro

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

Food Control 32 (2013) 134–142

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Food Control

journal homepage: www.elsevier.com/locate/foodcont

Review

Novel biotechnological applications of bacteriocins: A review

Eduardo Marcos Balciunas [a], Fabio Andres Castillo Martinez [a], Svetoslav Dimitrov Todorov [b], Bernadette Dora Gombossy de Melo Franco [b], Attilio Converti [c], Ricardo Pinheiro de Souza Oliveira [a,*]

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[b] Food and Experimental Nutrition Department, Faculty of Pharmaceutical Sciences, University of São Paulo, São Paulo 05508-900, Brazil
[c] Department of Chemical and Process Engineering, Genoa University, Genoa I-16145, Italy

Advances in Colloid and Interface Science xxx (2014) xxx–xxx

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Advances in Colloid and Interface Science

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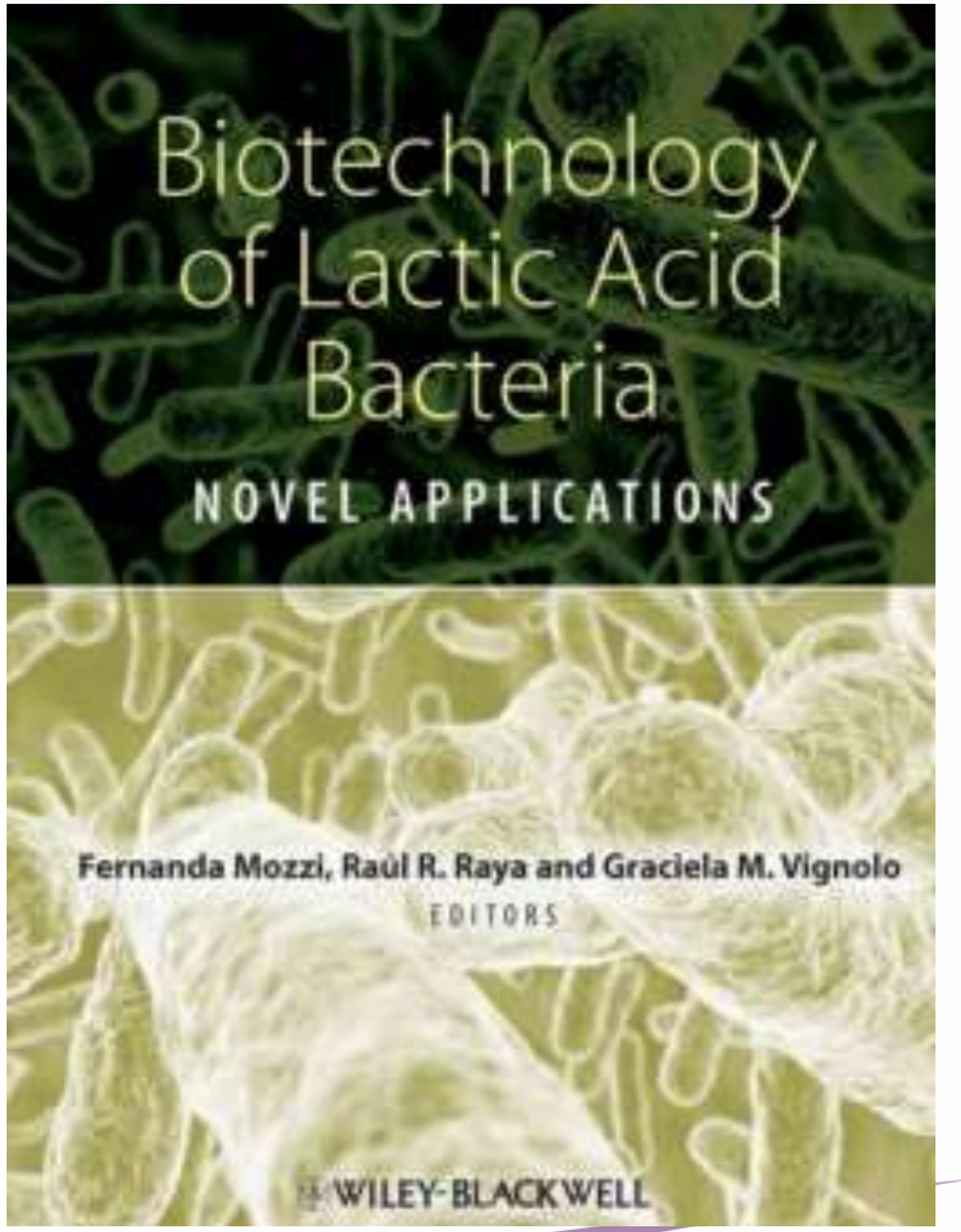
Lactic acid bacteria in dairy food: Surface characterization and interactions with food matrix components

J. Burgain [a], J. Scher [a], G. Francius [b], F. Borges [a], M. Corgneau [a], A.M. Revol-Junelles [a], C. Cailliez-Grimal [a], C. Gaiani [a,*]

[a] Université de Lorraine, LIBio, Laboratoire d'Ingénierie des Biomolécules, 2 av de la Forêt de Haye, TSA 40602, 54518 Vandoeuvre lès Nancy, France
[b] Université de Lorraine, LCPME, Laboratoire de Chimie Physique et Microbiologie pour l'Environnement, UMR 7564, 54600 Villers-lès-Nancy, France


Biotechnology of Lactic Acid Bacteria
NOVEL APPLICATIONS
Fernanda Mozzi, Raúl R. Raya and Graciela M. Vignolo
EDITORS
WILEY-BLACKWELL

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