

Pendaftaran

Kepada Yth

Sekretariat Seminar Internasional Lactic Acid Bacteria & Other Important Microbes

Their Role in Food, Health, and Industry
Pusat Studi Pangan dan Gizi UGM
Jl. Teknika Utara, Berek, Yogyakarta
Telp/Fax (0274) 589242

Nama :
Instansi/perusahaan :

Alamat :
:
:

Kode Pos :
Telp/Fax :
E-mail :

Kategori peserta

☐ Umum ☐ Mahasiswa S2/S3 ☐ Mahasiswa S1

Mendaftarkan diri sebagai

☐ Pemakalah ☐ Tanpa makalah

Judul makalah

.....
.....
.....

Pembayaran

: Rp

☐ Tunai

☐ Tranfer ke Bank BNI cabang UGM

Tranfer ke Bank BNI cabang UGM Yogyakarta,

Nomer Rekening : 0039234457

Alas Nama : Pusat Studi Pangan Gizi UGM

(bukti transfer dan formulir pendaftaran mohon dikirim via
faks ke 0274-589242, atau diattach via email pada

alamat islab_jogja@yahoo.com

.....

(.....)

Panduan penulisan

ABSTRAK

1. Abstrak maksimum 300 kata dengan font Times New Roman 12, 1 spasi.
2. Berisi informasi judul makalah, nama penulis, alamat institusi dan alamat e-mail.
3. Abstrak dikirim via website atau e-mail ke alamat islab_jogja@yahoo.com dengan subject Abstrak_ISLAB-[nama_penulis]
4. Abstrak diterima paling lambat tanggal 24 Desember 2008 dan akan direview oleh panitia
5. Informasi penerimaan abstrak akan diinformasikan melalui website (www.islab2009.ugm.ac.id)

FULL PAPER

1. Ditulis dengan font Times New Roman 12, 2 spasi (kecuali abstrak 1 spasi)
2. Maksimal 15 halaman ukuran kertas A4.
3. Softcopy full paper dikirim via website atau e-mail ke alamat islab_jogja@yahoo.com dengan subject Fullpaper_ISLAB-[nama_penulis]
4. Full paper diterima paling lambat 8 Januari 2009. Full paper yang diterima setelah tanggal tersebut tidak dimasukkan dalam prosiding.

Biaya

Sebelum 31 Desember 2008

1. Pemakalah/praktisi/akademisi/umum Rp 200.000,00
2. Mahasiswa S2/S3 Rp 150.000,00
3. Mahasiswa S1 Rp 50.000,00

Setelah 31 Desember 2008

1. Pemakalah/praktisi/akademisi/umum Rp 250.000,00
2. Mahasiswa S2/S3 Rp 175.000,00
3. Mahasiswa S1 Rp 75.000,00

Harga prosiding + ongkos kirim Rp 400.000,00

Cara Pembayaran

Pembayaran pendaftaran dikirim ke rekening:

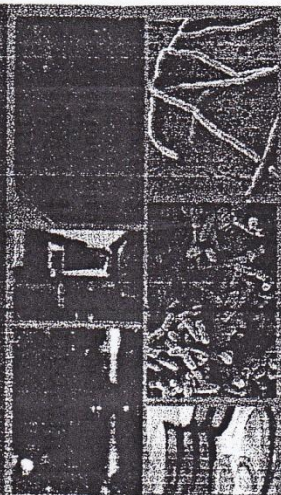
BNI Cabang UGM No : 0039234457

a/n Pusat Studi Pangan dan Gizi

Universitas Gadjah Mada

Pendaftaran dilakukan ke Sekretariat Panitia Seminar dengan alamat Pusat Studi Pangan dan Gizi Universitas Gadjah Mada Jl. Teknika Utara, Berek, Yogyakarta, Telp/Fax 0274 589242 atau melalui e-mail islab_jogja@yahoo.com dengan menyertakan formulir pendaftaran dan bukti transfer.

Pengumuman 1



Seminar Internasional

Lactic Acid Bacteria & Other Important Microbes

Their Role in Food, Health, and Industry

Ruang Seminar Ia 3
Gedung PAU Pascasarjana UGM
Jl. Teknika Utara, Berek, Yogyakarta

Diselenggarakan oleh
ISLAB,
FORKOMIKRO
Pusat Studi Pangan dan Gizi
Universitas Gadjah Mada



16-17 Januari
2009

Table of Contents

List of Supporting Institution	i
Table of Contents	iii
Introduction.....	vii
Preface from the Organizing Committee.....	viii
Preface from the Chairman of ISLAB.....	xi
Summary Presentation from Invited Speaker	
▪ Effect of Probiotic to the Diarrhea Patients M.Juffrie.....	1
▪ Gastrointestinal Commensals Modulate Immunity and Energy Metabolism of The Host Yuan Kun Lee.....	2
▪ Indonesian Indigenous Lactic Acid Bacteria : Their Potential Application and Conservation for Sustainable Usage I.N. Sujaya, N.P. Desy Aryantini, N.W. Nursini, K. A. Nocianitri, Y. Ramona, D.M. Sukrana, K. Asano, F. Tomita.....	3
▪ Population Dynamic of Gastrointestinal Microbes in Carcinogen Treated Animal Achmad Dinoto.....	4
▪ The Enterococci : between Pathogen and Probiotics Agus Wijaya.....	5
▪ Lactic Acid Bacteria in Foods Endang S. Rahayu.....	6
▪ Quality Control of Lactic Acid Bacteria in RIKEN BRC-Japan Collection of Microorganisms Yoshimi Benno.....	7
▪ Future Trend of Probiotic products Fusao Tomita.....	10
Technical Session Papers	
A1-1 Isolation and Characterization of Soy Milk Fermenting Lactic Acid Bacteria from Infant Feces K. A. Nocianitri , I.D.G.M. Pertmana, K. Asano, M. Tanaka, I.N. Sujaya.....	Full Paper Not Available
A1-2 Karakterisasi bakteri Asam Laktat yang Diisolasi dari Susu Kuda Bima Nyoman Semadi Antara, Nyoman Dibia, Wayan Redi Aryanta.....	11
A1-3 Scientific Evidence of Local Probiotic <i>L. plantarum</i> and <i>E. faecium</i> strains Isolated from Dadih Ingrid S. Surono.....	Full Paper Not Available
A1-4 Pengaruh Suplementasi Probiotik terhadap Struktur Usus Ayam Broiler Sri Harimurti, Endang S. Rahayu, Nasroedin, Kurniasih.....	27
A1-5 The Effect of Fermented Milk Metabolites in Profile Lipid on <i>Sprague Dawley</i> with Standard Diet Dewi Ratna Nurhayati, Eni Harmayani, Y. Marsono.....	Full Paper not Available

A2-1	Comparison of Lactate Reduction Strategies for Enhancement of Nisin Production by <i>Lactococcus lactis</i> Agustin Krisna Wardani.....	32	
A2-2	Karakteristik Biokapsul <i>Lactobacillus</i> Dad 13 Dengan Berbagai Jenis dan Konsentrasi Bahan Pengkapsul Ngatirah, Maria Ulfah, P. Dino T.....	42	
A2-3	Potensi Tape Biji Teratai (<i>Nyhmphaea</i> sp.) Sebagai Makanan Fungsional Rita Khairina, Iin Khusnul Khotimah, Endang S. Rahayu.....	55	
A2-4	Fermentasi Terkendali Petis Daging dengan Kultur Starter <i>Pediococcus acidilacticii</i> YDA3 dan <i>Pediococcus pentosus</i> YDA4 Yoyok Budi Pramono, Endang S. Rahayu, Suparmo, Tyas Utami.....	66	
A2-5	Sensitivitas Bakteri Gram Positif terhadap Katekin yang Diekstraksi dari Gambir (<i>Uncaria gambir</i> Roxb) Rindit Pambayun, Murdijati Gardjito, Slamet Sudarmadji, Kapti Rahayu K.....	70	
A3-1	Antimicrobial Activity of Lactic Acid Bacteria Isolated from Fruit Juices of Ginseng (<i>Panax</i> sp.) Ema Damayanti, Agus Susanto.....	78	
A3-2	Response of Lactic Acid Bacteria Growth on the Media Containing Earth Worm Meals (<i>Lumbricus rubellus</i>) as Feed Additive Ahmad Sofyan, Ema Damayanti, Hardi Julendra.....	84	
A3-3	Influence of Bile on Lactobacilli Viability and Ability to Reduce Lactose in MRSL Broth Tyas Utami, Kasmianti, Eni Harmayani, Endang S. Rahayu.....	88	
A3-4	A Study of Lactic Acid Bacteria Agglutination during Manufacture of Cottage Cheese Basuni Hamzah.....	96	
A3-5	Perubahan Kimiawi pada Air Kelapa Pascabuka Sri Luwihana, Retno Indrati.....	100	
B1-1	Growth Characteristic of Lactic Acid Bacteria Isolated from Fermented Fruit Juice of Noni (<i>Morinda citrifolia</i>) in Soymilk Lanjar Sumarno, Ema Damayanti.....	106	
B1-2	Peningkatan Kualitas Yoghurt Beku Susu Kacang Merah (Kajian Senyawa Cryoprotectant dan Suhu Pembekuan) Enny Karti B.S, Ratna Y, Dewanti A. O.....	111	
B1-3	Pengaruh Perbandingan Kacang Hijau dengan Air Serta Konsentrasi Starter Yoghurt Terhadap Karakteristik Yoghurt Kacang Hijau (<i>Vigna radiate</i>) Leni Herliani Afrianti, Bonita Anjarsari, Kinda Dyah M.....	Available	Full Paper not available
B1-4	Karakteristik Fisikokimia Yoghurt Kedelai dan Kacang Tanah Yeyen P. Wanita, Retno U. Hatmi, Titi Djaafar, Siti Rahayu.....	121	
B1-5	Exploiting Tofu Liquid Waste Become Healthy Food by Lactic Acid Bacteria and Determination of Its Cholesterol Levels <i>In Vitro</i> Siti Nur Jannah, Endang Kusdiyantini, Arina Tri Lunggani.....	131	
B2-1	The Effect of Starter <i>Lactobacillus plantarum</i> Concentration and Fermentation Time Rosida, Enny Karti B.S. Nasim H.....	139	
B2-2	Organoleptic and Chemical Quality of Rucah Fish Fermentation with Lactic Acid Bacteria as Starter Sri Sumarsih. T. Yudiarti, C.S. Utama, Endang S. Rahayu.....	Available	Full Paper not available



Indonesian Society of Lactic Acid Bacteria



Pusat Studi Pangan dan Gizi
Universitas Gadjah Mada



Forum Komunikasi Kurator Koleksi Mikroorganisme
Indonesia

Sertifikat

Diberikan kepada :

Basuni Hamzah

Sebagai Peserta Seminar

Lactic Acid Bacteria & Culture Collections:

Their Role in Food, Health, Industry and the Important of Management of Culture Collection

Yogyakarta, 16 - 17 Januari 2009
Auditorium Fakultas Teknologi Pertanian
Universitas Gadjah Mada

Koordinator ISLAB,

Prof. Dr. Ir. Endang S. Rahayu

Kepala,

Pusat Studi Pangan dan Gizi - UGM



Dr. Ir. Eni Harmayani, M.Sc.

Koordinator FORKOMIKRO,

Dr. Wellyzar Sjamsuridzal

A STUDY OF LACTIC ACID BACTERIA AGGLUTINATION DURING MANUFACTURE OF COTTAGE CHEESE

Basuni Hamzah

University of Sriwijaya, Indralaya, Sumatera Selatan

0	5	0	7	0	1	0	1	0	9	0	1	0	1	0	0	3	0
Fakultas	Prodi	Publikasi	Penulis	Tahun	Sumber	Dana	Nomor Urut										

ABSTRACT

In the manufacture of cottage cheese, agglutination occurs when lactic cultures form long chains and clumps of chains. These chain of cells often form a net like structure that fall to the bottom of the vat and sweeps or entraps the casein in the skim milk.

*In this study, skim milk homogenized at 0, 28 (single stage), and 71 kg/cm² (dual stage, 35 kg/cm² second stage) was used in the manufacture of cottage cheese. Each lot of skim milk manufacture into cottage cheese was inoculated with one bulk starter (Lactic culture M30, lactic culture M37, or *Lactococcus lactis* subsp. *cremoris* UC310. Each bulk starter was homogenized at 0, 35 (single stage), 176, and 246 kg/cm² (dual stage, 35 kg/cm² second stage). The 18 different bulk starters were used to inoculate the 3 different skim milk treatments to produce a total of 54 bulk starter-skim milk treatment combinations. All 54 bulk starter-skim milk treatment combinations were randomized prior to their manufacture. The experiment was replicated two times in the manufacture of 108 vats of cottage cheese. Culture agglutination was determined by pH and curd total solids.*

*Culture agglutination decreased as the homogenization pressure applied to bulk starter was increased. The agglutination, also, decreased with increased homogenization pressure applied to skim milk. *L. lactis* subsp. *cremoris* UC310 was more sensitive to agglutination than the other 2 commercial cultures Lactic culture M30 and M37. Lactic culture M30 could be selected as representative commercial culture that would be used to determine the effect of agglutination on yield during the manufacture of cottage cheese.*

INTRODUCTION

In manufacturing cottage cheese a culture media is necessary to prepare the lactic bulk starter. Hingh cell populations can be obtained when the starter grown in media at optimal conditions. Christensen (1972) indicated that slow or complete starter failure is very common in the cheese industry. Sandine (1977) identified some areas of culture problems: a) phage inhibition, b) inhibition by agglutinins, c) Agglutinins inhibit the growth of microorganism, including starter

culture. One of the constituents in raw milk called 'lactenin' inhibits the growth of Lactococci (Jones and Simms, 1930). Auclair and Hirsch (1953) reported that two substances, Lactenin 1 and Lactenin 2, are responsible for inhibition. Jago (1954) found that the inhibitory substances are closely associated with the fat globules in milk and exert a mark effect because of the large surface area exposed. He also suggested that the substances are bacteriostatic rather than bactericidal and that they were enzymic in nature.

Randolph and Gould (1968) found that the natural inhibitors of milk are active against certain lactic acid-producing Lactococci are antibodies. In manufacturing cottage cheese, agglutinins can interfere with normal acid development in milk. During normal fermentation of milk, lactic acid bacteria are distributed throughout the milk, causing even acid production. Some strains of Lactococci are not affected by agglutinins, however, susceptible strains clump together and acid production is uneven (Ryan, 1985).

Scheuble et al. (1989) studied agglutination of lactic Lactococci and found that the agglutinin concentration of milk from the eighth postpartum is sufficient to result in severe agglutination of highly susceptible strains. Milk derived from recently freshened cows contain high levels of colostrums-derived agglutinins resulting in seasonal agglutination-related problems for cheese manufacturers. Microscopic analyses showed that cells in mildly-agglutinating strains associated with each other randomly, with some cells in a chain not bound to other cells while other cells in the chain were bound to two or more cells. They propose that the severity of agglutination of a particular strain depends on the frequency with which a specific antigenic determinant is expressed on the cell surface, and on the agglutinin titer. They also speculated that long-chain strains which are sensitive to agglutinins will cause increase defects under commercial production.

There were three species of lactic Streptococci; *Streptococcus lactis*, *Streptococcus cremoris* and *Streptococcus diacetilactis* (Sandine et al. 1972). These

organisms have been renamed in the current nomenclature, there are now two species of Lactococci; *Lactococcus lactis* subsp. *lactis* (formerly *Streptococcus lactis*) and *Lactococcus lactis* subsp. *cremoris* (formerly *Streptococcus cremoris*)

MATERIAL AND METHODS

In this study, skim milk homogenized at 0, 28 (single stage), and 71 kg/cm² (dual stage, 35 kg/cm² second stage) was used in the manufacture of cottage cheese. Each lot of skim milk manufacture into cottage cheese was inoculated with one bulk starter (Lactic culture M30, lactic culture M37, or *Lactococcus lactis* subsp. *cremoris* UC310). Each bulk starter was homogenized at 0, 35 (single stage), 176, and 246 kg/cm² (dual stage, 35 kg/cm² second stage). The 18 different bulk starters were used to inoculate the 3 different skim milk treatments to produce a total of 54 bulk starter-skim milk treatment combinations. All 54 bulk starter-skim milk treatment combinations were randomized prior to their manufacture. The experiment was replicated two times in the manufacture of 108 vats of cottage cheese. Culture agglutination was determined by pH and curd total solids.

RESULT AND DISCUSSION

After 3 h of incubation all three cultures were observed to be agglutinated (Table 1). Agglutination was determined in skim milk by monitoring the pH at the top and the bottom of the cylinder. When the top/bottom pH differential was greater than .07 agglutination was considered to

have occurred in the skim milk (Hicks et al., 1988).

When bulk cultures homogenized at 246 kg/cm² (dual stage, 35 kg/cm² second stage) decreased agglutination of all cultures. These data confirm the work of Milton et al. (1987) who observed that homogenization of bulk culture prior to inoculation into skim milk inhibits agglutination and increases starter counts. Agglutination was not observed when both bulk culture and skim milk were homogenized at 246 kg/cm² (dual stage, 35 kg/cm² second stage) and at 28 kg/cm² (single stage), respectively. Agglutination of lactic culture M30 was observed after 2 hours of incubation even though the bulk culture had been

homogenized at 35 kg/cm² (single stage). Lactic culture M37 exhibited agglutination within 3 hours after inoculation at 5% into skim milk when the bulk culture was not homogenized. Milton et al. (1987) reported that *L. lactis* subsp. *cremoris* UC310- agglutinated within 15 min after being inoculated into skim milk columns. When cottage cheese was manufactured in vats holding approximately 7000 g of skim milk with lactic culture M30 and M37, agglutination decreased as the pressure of homogenization of the bulk culture increased (Table 2). From these data a pressure of 246 kg/cm² (dual stage, 35 kg/cm² second stage) appeared to be necessary to completely inhibit agglutination.

Table 1. Effect of Bulk Culture and Skim Milk Homogenization on Agglutination of Three Cultures (Lactic culture M30 and M37, and *L. lactis* subsp. *cremoris* UC310-) as determined by pH differentials between the top and bottom of skim milk column.

Cultures	pH		
	NHBC & NHSM Top/bottom	HBC & NHSM Top/bottom	HBC & HSM Top/bottom
M30	5.31/4.52	5.23/5.21	5.18/5.17
M37	5.41/4.25	6.07/6.05	5.63/5.62
UC310-	5.76/4.78	5.16/5.13	5.30/5.27

pH = pH measurements after 3 h of incubation; NHBC = Non-homogenized bulk culture (0 kg/cm²); NHSM = non-homogenized skim milk (0 kg/cm²); HBC = Homogenized bulk culture (246 kg/cm² dual stage, 35 kg/cm² second stage); HSM = Homogenized skim milk (246 kg/cm² dual stage, 35 kg/cm² second stage)

Table 2. Effect of bulk culture homogenization on agglutination of two cultures as determined by pH differentials between top and bottom of cheese milk

Lactic Culture	BCH	pH				
		Hr 1 T/B	Hr 2 T/B	Hr 3 T/B	Hr 4 T/B	Hr 5 T/B
M30	35	6.2/6.2	6.0/5.9	5.6/4.9	5.3/4.7	5.1/4.5
	176	6.2/6.2	6.0/6.0	5.8/5.6	5.4/4.8	5.1/4.6
	246	6.2/6.2	6.0/6.0	5.6/5.3	5.3/4.8	5.0/4.8
M37	35	6.3/6.3	6.2/6.2	6.0/5.8	5.7/5.4	5.5/4.8
	176	6.3/6.3	6.1/6.0	5.8/5.7	5.4/4.8	5.2/4.6
	246	6.3/6.3	6.1/6.0	5.7/5.2	5.4/4.8	5.2/4.6

BCH = Bulk culture homogenization pressure (kg/cm²); T/B = Top/Bottom

Table 3. Effect of bul culture homogenization on dry matter yields using lactic culture M30 and M37

Lactic Culture	Homogenization Pressure (kg/cm ²)	DM Cheese Yield (kg/100 kg skim milk)
M30	35	3.02
	176	3.15
	246	3.14
M37	35	2.81
	176	3.00
	246	3.09

CONCLUSION

Culture agglutination decreased as the homogenization pressure applied to bulk starter was increased. The agglutination, also, decreased with increased homogenization pressure applied to skim milk. *L. lactis* subsp. *cremoris* UC310- was more sensitive to agglutination than the other 2 commercial cultures Lactic culture M30 and M37. Lactic culture M30 could be selected as representative commercial culture that would be used to determine the effect of agglutination on yield during manufacture of cottage cheese.

REFERENCES

- Christensen, V.W. 1972. Recent Developments in Starter Techniques. Dairy Ind. 37:655
- Hicks, C.L., M. Alaudin, B.E. Langlois, and J. O'Leary. 1982. Psychrotropic bacteria reduced cheese yield. J. Food Prot. 45:331
- Hicks, C.L., K. Milton, S. riddell-Lawrence, D. Wang, and J. O'Leary. 1989. Simplified methods to detection of agglutination in cottage cheese vats. Cult. Dairy Product j. 24:5.
- Jago, G.r. and M.F. Sinbourne. 1959. Factors influencing the lactic acid-producing properties of streptococci used in the manufacture of cheddar cheese. II. Observations relating susceptibility with insusceptibility. J. Dairy Res. 26:123
- Jose, C., C.L. Hicks, and J. O'Leary. 1989. Effect of lecithin and milk fat and without homogenization on bulk starter performance and skim milk agglutination. J. dairy Sci. 72 (supl. 1):146 (abst.)
- Milton, K., C.L. Hicks, J. O'Leary, and B.E. Langlois. 1987. Effect of lecithin addition and homogenization of bulk starter on agglutination. J. dairy Sci. 70 (supl. 1):92 (abst.)
- Ryan, J. J. 1985. Agglutinins affect acid development. Dairy Field 168:53
- Sandine, W.E. 1977. New Techniques in handling lactic cultures to enhance their performance. J. Dairy sci. 60:822
- Scheube, T.L., J.K. Kondo, and M.A Salih. 1989. Agglutination behavior of lactic streptococci. J. Dairy Sci. 72:1103