

MEMORANDUM


The Japanese Management Consultation (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency, which is implementing the Fermented Dairy Products Development Project (hereinafter referred to as "the Project") in the Republic of Bulgaria as a part of Technical Cooperation Programme of the Japanese Government and headed by Mr. SATO Tadaaki, Director, National Livestock Breeding Centre, Niikappu Station, Ministry of Agriculture, Forestry and Fisheries, visited the Republic of Bulgaria from 2nd of June to 11th of June, 1998.

The Team discussed the issue with the Agency for International Aid regarding the smooth customs clearance, and the exemptions from customs duties, taxes, internal taxes, value added tax and any other fiscal levies of machinery, equipment and other materials (hereinafter referred to as "the Equipment") provided by the Government of Japan under Japan's Technical Cooperation Scheme.

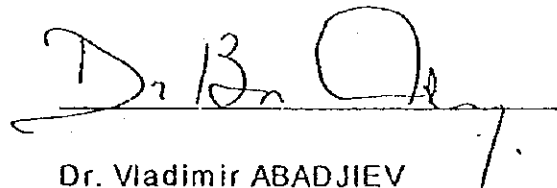
The Equipment is indispensable for the implementation of the Project and the considerable delay of the delivery of the Equipment to the both sites of the Project due to the customs clearance procedure might hamper the smooth progress of the Project.

As the result of the discussions, Agency for International Aid clearly stated that the exemptions from any form of the fiscal levies including value added tax and the smooth customs clearance of the Equipment will be secured from now on by the Agency for International Aid as the responsible authority concerned on this matter.

Sofia, 4th June, 1998



Mr. SATO Tadaaki
Leader,
Management Consultation,
Japan International Cooperation Agency,
Japan



Dr. Vladimir ABADJIEV
Director,
Agency for International Aid,
Republic of Bulgaria



AGENCY FOR INTERNATIONAL AID

TERMS

**ACCORDING TO WHICH THE AGENCY FOR INTERNATIONAL AID (AIA)
IS ENTITLED TO EXEMPT FROM CUSTOM DUTIES AND TAXATIONS
THE HUMANITARIAN AID COMING FROM ABROAD**

**THE AGENCY FOR INTERNATIONAL AID (AIA) WAS ESTABLISHED BY A LAW
IN NOVEMBER 9TH, 1990. IT IS A STATE INSTITUTION ENTITLED TO ACCEPT,
DISTRIBUTE AND CONTROL THE FINAL UTILIZATION OF THE HUMANITARIAN AID,
GRANTED TO BULGARIA BY FOREIGN COUNTRIES, ORGANIZATIONS AND PRIVATE
PERSONS.**

**THE AGENCY ACCEPTS DONATIONS, ADDRESSED TO NEEDY HEALTH,
SOCIAL AND OTHER STATE INSTITUTIONS.**

**AIA PERFORMS ALSO CUSTOM CLEARANCE REGARDING DONATIONS FOR
FOUNDATIONS, ASSOCIATIONS AND ALL NON PROFIT LEGAL ENTITIES
THROUGH THE LOCAL MUNICIPALITY SOCIAL CARE CENTERS AND OTHER STATE
INSTITUTIONS, EMPOWERED TO DO THIS AND THEY ARE OBLIGED TO KEEP
STRICTLY DONOR'S WILL.**

**ACCORDING TO ARTICLE 6. OF AIA'S LAW, THE HUMANITARIAN AID IS TO BE
RELEASED FROM CUSTOM DUTIES, FEES AND TAXATION.**

**EVERY CONSIGNMENT WITH HUMANITARIAN AID SHOULD BE ACCOMPANIED
BY THE FOLLOWING DOCUMENTS, REQUIRED BY THE BULGARIAN LEGISLATION:**

**1) A LETTER FROM THE DONOR (WITH EXACT AND DETAILED ADDRESS) HOLDING
AN INFORMATION ABOUT:**

A) STATEMENT THAT THE SHIPMENT IS HUMANITARIAN AID;

**B) DONOR'S WILL (IF THERE IS ANY) WITH DIRECTIONS ABOUT THE FINAL
RECIPIENT;**

**C) DETAILED INVENTORY LIST WITH DESCRIPTION OF ITEMS AND
QUANTITY;**

D) CUSTOM RELEASE VALUE (ONLY FOR CUSTOM AUTHORITIES);

**E) ON WHICH ACCOUNT WILL BE THE TRANSPORTATION OF THE AID
(DONOR'S OR RECIPIENT'S).**

**2) THE MEDICINES SHOULD BE ACCOMPANIED BY INVENTORY LIST GIVING
DESCRIPTION BY KIND, QUANTITY, EXPIRY DATE AND TOTAL VALUE.**

**3) THE FOODSTUFFS SHOULD BE ACCOMPANIED BY HEALTH CERTIFICATE,
VERIFYING THE EXPIRY DATE.**

**4) SECOND HAND CLOTHES SHOULD HAVE AN ACCOMPANYING CERTIFICATE FOR
DESINFECTATION.**

5) IN ORDER TO MANAGE IN TIME CUSTOM CLEARANCE AND TO PROMOTE FURTHER THE HUMANITARIAN AID, IT'S ADVISABLE IN TRANSPORT DOCUMENTS TO POINT OUT AS A FIRST RECIPIENT THE AGENCY FOR INTERNATIONAL AID, AND ON THE SECOND PLACE - THE FINAL RECIPIENT, IF HE IS DETERMINED. IT'S ADVISABLE TO INFORM THE AGENCY IN DUE TIME ABOUT THE DELIVERY OF THE SHIPMENT WITH THE DONATION.

6) THE TRANSPORTATION OF THE HUMANITARIAN AID IS PERFORMED ON AIA'S ACCOUNT ONLY AFTER PRE-COORDINATION AND WRITTEN CONFIRMATION ON BEHALF OF THE AGENCY.

7) IN ITS ACTIVITIES AIA KEEPS STRICTLY DONOR'S WILL AND CONTROLS ITS USE BY ADDRESSED PURPOSE. AIA STORES ALL DOCUMENTATION CONNECTED WITH THE THE REACHING AND ACCEPTANCE OF THE AID BY THE FINAL RECIPIENT AND EVERY DONOR , IF HE WILLS, CAN GET INFORMATION ABOUT THIS AND COPIES OF THESE DOCUMENTS.

CONTACT TEL.:

**DIRECTOR: 803 328
981 10 85**

**88 - 33-46 RESOURCES FOR INTERNATIONAL AID DEPT.
987-96-47 ACCEPTANCE AND CUSTOM CLEARANCE DEPT.**

**FAX: + 359 2 88-19-51
E Mail: ala@omega.bg**

資料 4. 暫定機材整備計画

ブルガリアはっ酵乳製品開発計画 主要な機材 (1年度は確定、2年度は予定、3年度以降は計画)

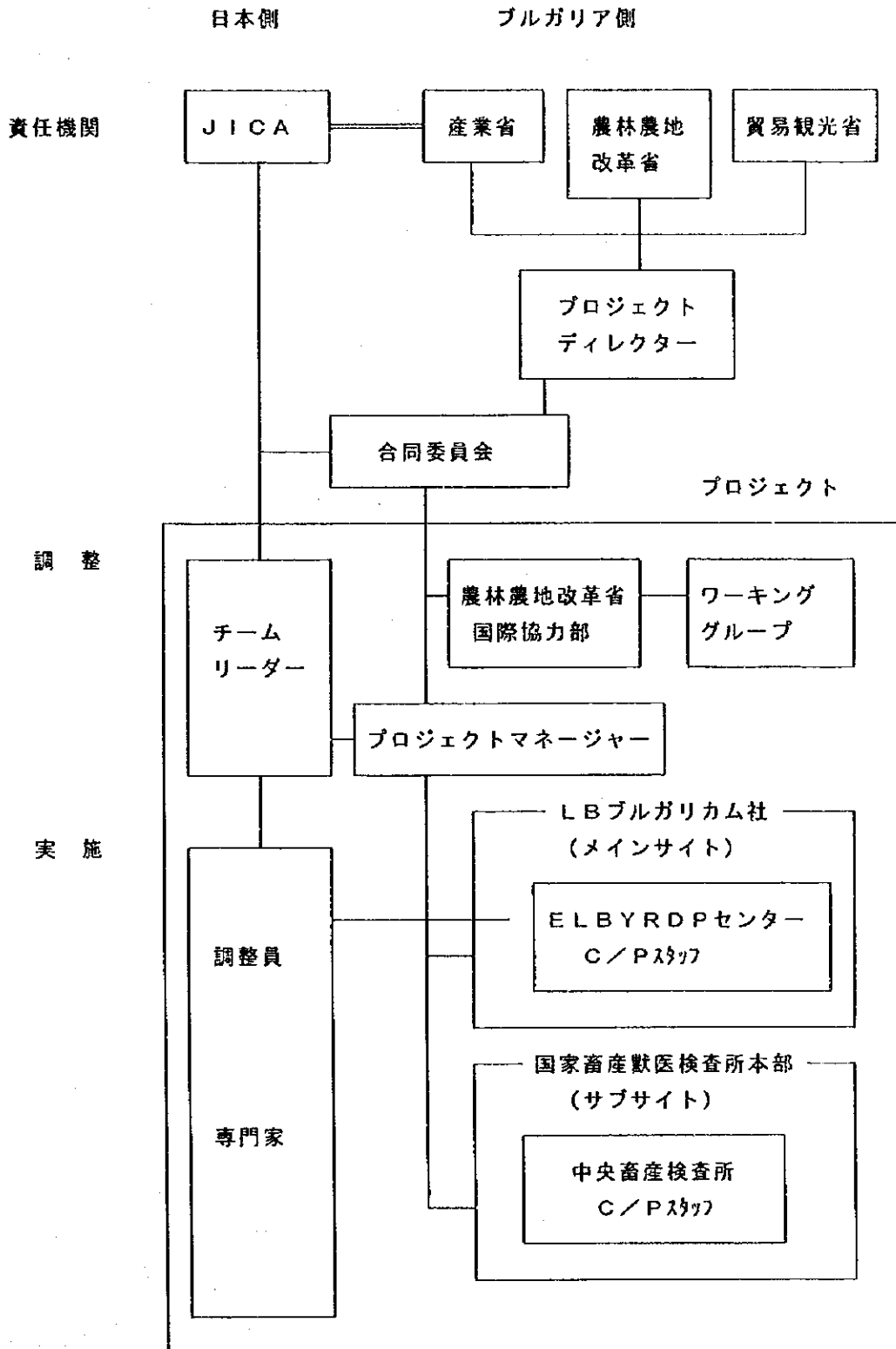
98年3月26日現在

分野	1年度 (1997年度)		2年度 (1998年度)		3年度 (1999年度)		4年度 (2000年度)		5年度 (2001年度)	
	千円	品名	千円	品名	千円	品名	千円	品名	千円	品名
(1) 生乳検査分野 (サブサイト)	723	顕微鏡一式	4,893	顕微鏡	11,000	顕微鏡	10,000			
	258	オートプレート(2)	12,000	オートプレート	2,256	オートプレート				
	201	ミニシリンダー								
	565	分離器								
	142	ゲルハル牛乳脂肪分								
	298	乾燥機								
	9,807	高速液体分取機	8,100	高速液体分取機						
	4,227	高速冷却离心机	178	呼吸器(3)						
	1,047	超音波洗浄機								
	3,530	紫外可視分光光度計	400	呼吸器(3)	2,453	遺伝子解析システム	1,500			
	590	恒温水槽	850	純水製造装置	500	フィルター(連続)	500			
	224	分析用電子天秤	190	電子天秤	514	電子レンジ	50			
	393	D-1000	1,150	蒸留水製造装置	400	モニター	260			
	2,542	超低温フリーザー	501	小型冷蔵庫	750	シータス用泳動槽	200			
	484	フリーザー	714	顕微鏡	306	PCR	300			
1,251	恒温器(3)	500	真空オーブン	501	PCR	1,000				
2,453	低温恒温器(3)	2,100	アルミ電気式動装置	172						
763	顕微鏡一式	1,100	卓上离心机	286						
314	オートプレート(2)	936	顕微鏡用撮影装置	1,442						
(3) 乳製品加工 (メインサイト)	2,529	真空凍結乾燥機	2,256	オートプレート	4,000	オートプレート				
	342	乾燥装置	530	乾燥装置	100	乾燥装置				
	1,136	高圧滅菌器(2)	817	水分測定用天秤	2,500	粘度分布計	9,500			
	300	乾燥機	794	低温測定器	3,240	オートプレート	660			
	607	B型粘度計	350	OHP	850	オートプレート	240			
	292	攪拌機	185	上皿天秤	180	製氷機	304			
	1,031	電動分注器			210					
	678	粘度計用低温水槽								
	3,309	東西			37,793		28,499			
					1,207		6,501			
			39,000		39,000		34,000			
			1,000		1,000		1,000			
			40,000		40,000		35,000			
	全合計	48,000		40,000		40,000		35,000		

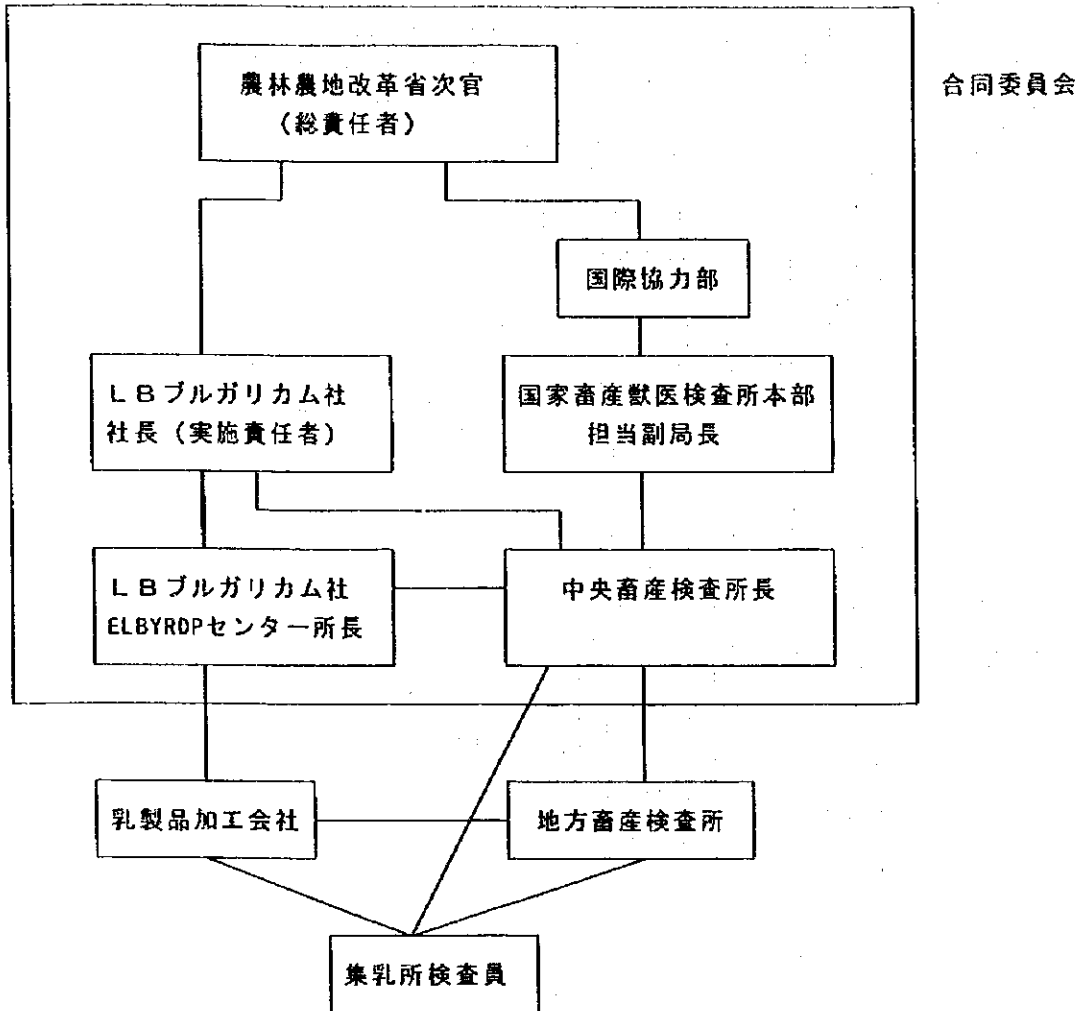
注) ①機材は1台当たり10万円以上のものを提示しており、複数個のものは合計金額である。
②1年度のバッチの機材は、未到着であることもあり分野別には計画外である。

資料5. プロジェクト組織図

プロジェクト組織図



実施機関組織図



資料6. 専門家派遣実績

専門家派遣

平成10年3月31日

予算年 細目	1997年 (H9年) 456 789 10112 123	1998年 (H10年) 456 789 10112 123	1999年 (H11年) 456 789 10112 123	2000年 (H12年) 456 789 10112 123	2001年 (H13年) 456 789 10112 123
長期	チームリーダー	岩倉 栄 97/7/2~99/7/1			
	調整員	芳根 和子 97/6/4~99/6/3			
	原料乳管理	藤田 泰仁 97/10/1~99/9/30			
	乳製品微生物	伊澤 佳久平 97/7/2~99/7/1			
	乳製品加工	福井 宗徳 97/7/2~99/7/1			
短期	金子勉98/2/4~98/3/4				
	折居 直樹98/2/25~98/3/25				
専門家派遣					

資料7. C/P研修実績・配置一覧
C/P配置一覧表

分野	予算年 月 c/p名	配置状況					日本研修		備考 (注) 技術移転/技術習得状況等に関するコメント等
		1997年	1998年	1999年	2000年	2001年	年度	主な研修先	
行政管理	6 10 1	4 7 10 1 4 7 10 1 4 7 10 1					96	農水省	96/11/12-96/11/19
	I. Savov 97/7	.....						
	N. Soycheva 97/6	.....						
	G. Georgiev 97/7	.....						
	B. Gyosheva 97/7	.....						
S. Kondareva 97/7	.....							
原料乳管理	G. Simeonov 97/7	.....						
	I. Kostov 97/10	.....					97	明治乳業	97/9/26-97/12/20 98年度日本研修予定
	T. Dakova 98/3	.....						
	M. Bachisca 98/6	.....						
	V. Manolova 98/6	.....						
乳製品微生物・乳製品製造	V. Andreeva 97/7	.....						
	Z. Urshiev 97/7	.....						
	K. Peshova 97/7	.....						
	V. Pavlov 97/7	.....					97	明治乳業	97/9/26-97/12/21 98年度日本研修予定
	N. Ilkov 97/7	.....						
M. Michaylova 97/7	.....							
S. Minkova 97/7	.....							
Z. Dimitrov 97/7	.....							

資料 8. 日本側/ブルガリア側投入実績

日本側/ブルガリア側実績

(1998年3月31日)

予算年度	1997年度	1998年度	1999年度	2000年度	2001年度	備考
1 供与機材費	千円	千円				
1) 供与機材費	48,000	(40,000)				
2) 携行機材費	5,539					
3) その他						
2 ローカルコスト負担額						
1) 一般現地業務費	3,400	(7,200)				
2) 応急対策費		(2,500)				
3) その他						
3 ブルガリア側投入実績						
メインサイト						
1) 試薬	2,212					
2) 実験器具	1,750					
3) 光熱・水道費	50					
4) 国内電話料金	53					
5) 暖房費	100					
6) 専門家室等環境整備	621					
7) その他						
サブサイト						
1) 改装工事		14,286				
2) その他						

注 1) 機材供与費は、輸送費等を含んでいない。
 2) 交換レートは、97年度は100円を1,400レバとする。
 3) ブルガリア側の投入実績は、暦年である。
 4) () は予算額ベースである。

資料9. 機材管理/利用状況

(10万円以上160万円未満の機材 メインサイト設置) Equipment, 100 thousands - 1.6 million yen. 平成10年度3月31日現在

供与年度	番号	機材名(メーカー・規格・能力)	供与数	処分数	現存数	利用状況	管理状況	利用(保管)場所	処分理由等
平成9年	KM2	Apple Power Book 1400C	1	0	1	A	A	RDP	秀根旗行機材 447,100円
平成9年	KM14	スリーワンモーター MAZELA Z-2100	1	0	1	A	A	RDP	篠井旗行機材 120,000円
平成9年	KM35	pHメーター東亜電波工業 HM-40V	1	0	1	A	A	RDP	若倉旗行機材 192,500円
平成9年	KM37	電子天秤 島津 EB-3300DW	1	0	1	A	A	RDP	若倉旗行機材 122,500円
平成9年	KM40	IBM ThinkPad 760 EL9547J 4G	1	0	1	A	A	RDP	若倉旗行機材 289,000円

機材の利用、管理状況表

平成10年度3月31日現在

(160万円以上の供与機材—メインサイト設置 D.M.Z 1—) Donated Equipment, More than 1.6 million yen, for RDP Center

供与年度	番号	機材名（メーカー名・型式）	価格	数量	利用（保管）場所	利用状況	管理状況	備考（特記事項）
		なし						

平成10年3月31日現在

(10万円以上160万円未満の機材 サブサイト設置) Equipment, 100 thousands ~ 1.6 million Yen.

供与年度	番号	機材名 (メーカー・規格・能力)	供与数	処分数	現存数	利用状況	管理状況	利用(保管)場所	処分理由等
平成9	KS3	マイクロコンピュータ型心機 VS-1500	1	0	1	E	A	CIVSC	CIVSC未完成の為、稼働せず 藤田誘行機材 210,400円

(100万円以上の供与機材-サブサイト設置 DSZ 1-) Donated Equipment, More than 1.6 million yen, for Sub Site 平成 10 年 3 月 31 日

供与年度	番号	機材名 (メーカー名・型式)	価格	数量	利用 (保管) 場所	利用状況	管理状況	備考 (特記事項)
		なし						

ISOLATION AND IDENTIFICATION OF STRAINS FROM NATURE

**自然界サンプルからの菌株の分離及び同定
(C/P Micaela MICHAYLOVA)**

JICA Project in Bulgaria

2. Development of Characterization Research of Lactic Acid Bacteria

(1.) Development of Lactic Acid Bacteria Characterization Research

1. Collection and identification of new isolated lactic acid bacteria and their preservation

05.Jan – 30.Apr.1998

Contents

- 1. List of the samples from nature**
- 2. Isolation of the pure cultures (05.01- 05.02.1998)**
- 3. Identification of the strains (13.03- 30.04.1998)**

LIST OF THE SAMPLES FROM NATURE

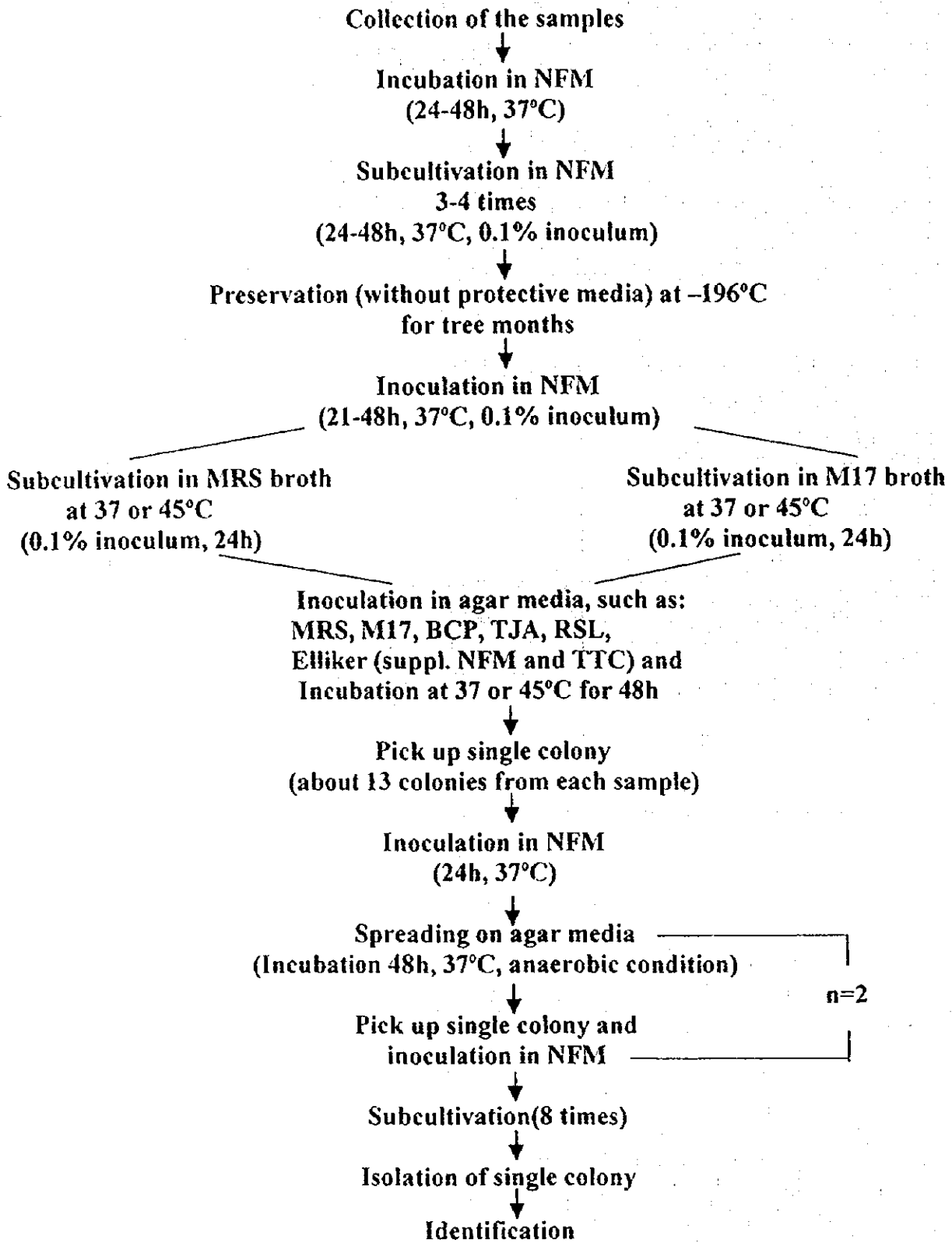
SAMPLES COLLECTED from 09.09.1997 to 30.09.1997

Nr	Region	Source
5.	Petrohan	Ants
6.	Petrohan	Kambanka
7.	Petrohan	Plant
8.	Petrohan	Plant
9.	Petrohan	Plant
10.	Petrohan	Plant
11.	Petrohan	Plant
12.	Petrohan	Strawberry, leave
13.	Petrohan	Ela
14.	Petrohan	Strawberry, fruit
15.	Petrohan	Strawberry, fruit
16.	Petrohan	Plant
17.	Petrohan	Minzuhar
18.	Petrohan	Magareski tran
19.	Petrohan	Cikoria
20.	Petrohan	Lopen
21.	Petrohan	Red clover (trefoil)
22.	Petrohan	Malina, fruit
23.	Petrohan	Whild rose, fruit
24.	Petrohan	Sambucus nigra (flower)
25.	Petrohan	Plant
Total 21		
26.	Bansko	Air
27.	Bansko	Hawthorn (fruit)
28.	Bansko	Fruit
29.	Bansko	Wild brair
30.	Bansko	Air
31.	Bansko	Debela mara
32.	Bansko	Whild rose, fruit
33.	Bansko	Moss
34.	Bansko	Whild rose, flower
35.	Bansko	Flower
37.	Bansko	Cikoria
38.	Bansko	Pink karnation
39.	Bansko	Жълт кантарион
40.	Bansko	Бял равнец
41.	Bansko	Air
42.	Bansko	Овчарска торбичка
43.	Bansko	Ant-hill
44.	Bansko	Row caw milk
45.	Bansko	Row sheep's milk
46.	Bansko	Row goat's milk
Ц(70)	Bansko	Plant
Total 21		
54.	Rupite	Plant
55.	Rupite	Plant
Total 2		
64.	Shiroka laka	Chrysanthemum
65.	Shiroka laka	Zokum
66.	Shiroka laka	Hedera
67.	Shiroka laka	Nasturtium
68.	Shiroka laka	Unknown plant
69.	Shiroka laka	Unknown plant
Total 2		

	PETROHAN	BANSKO	RUPITE	Shiroka laka	Total
Total number of the collected samples	21	21	2	6	50
Number of the samples with coagulation in NFM media	4	17	2	6	29
Initial numbers of isolated strains	36	164	16	73	289
Number of isolated homofermentative streptococci group II	12	19	-	25	56
Number of the strains, identified as <i>S. thermophilus</i>	12	11	-	15	38
Number of isolated homofermentative streptococci group IV	-	2	-	1	3
Number of the strains, identified as <i>Lc. lactis</i>	-	2	-	1	3
Number of isolated homofermentative lactobacilli group I	-	1	-	5	6
Number of the strains, identified as <i>L. bulgaricus</i>	-	1	-	1	2

During the procedures of isolation and incubation some of the isolated strains were rejected.

Scheme 1. Isolation and identification of strains from natural sources



ABBREVIATIONS

Number of the sample/number of the colony (ex. 10/2)

C – coagulation

r- reduction

w- weak

ngr- no growth

*** - shugars fermentation test were repeated for third time by using API 50 CH

TTC – Tripheniltetrazolium chloratum (LOBA – CHEMIE, WIEN)

NFM – non fat milk, 10% total solid

TJA – Tomato Juise Agar

RSL – Rogosa SL Agar

Sample № 10
 Region - PETROHAN
 Period - September, 1997
 Plant - no information

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS,Nr	10/2	10/3	10/4	10/5	10/6*	10/7	10/8	10/12	10/13
Media of isolation	M17	TJA	BCP	(Eliker, TTC, 10%NFM)	MRS	M17	(Eliker, TTC, 10%NFM)	MRS	(Eliker, TTC, 10%NFM)
Gr (+/-)	+	+	+	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr	ngr	ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	+w	-	-	-	-	-	-
Growth at 45°C	+	+	+	+	+	+	+	+	+
Growth at 50°C	+	+	+	+	+	+	+	+	+
Halotolerance (6.5 %NaCl)	-	-	-	-	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-	-	-	-	-
Gas production from glucose	-	-	-	-	-	-	-	-	-
Group	II	II		II	II	II	II	II	II
Reduction of litmus	C,r	C,r	C,r	C,r	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	-	-	-	-	-	-	-	-	-
NH ₃ production from arginine	-	-	-	-	-	-	-	-	-
Utilization of citrate	-	-	-	-	-	-	-	-	-
Rhamnose	-	-	-	-	-	-	-	-	-
Mannose	-	-	-	-	-	-	-	-	-
Sucrose	+	+	+	+	+	+	+	+	+
Maltose	-	-	-	-	-	-	-	-	-
Lactose	+	+	+	+	+	+	+	+	+
Starch	-	-	-	-	-	-	-	-	-
Inulin	-	-	-	-	-	-	-	-	-
Mannitol	-	-	-	-	-	-	-	-	-
Salicin	-	-	-	-	-	-	-	-	-
Fructose	-	-	-	-	-	-	-	-	-
Galactose	-	-	-	-	-	-	-	-	-
Identified as	S <i>S. thermophilus</i>	S <i>S. thermophilus</i>		S <i>S. thermophilus</i>	S <i>S. thermophilus</i>	S <i>S. thermophilus</i>	S <i>S. thermophilus</i>	S <i>S. thermophilus</i>	S <i>S. thermophilus</i>

10/6* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	4	4	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 17

Period – September, 1997

Region – PETROHAN

Plant – Minzuhar

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	17/1	17/2	17/3	17/4*
Media of isolation	MRS	M17	BCP	MRS
Gr (+/-)	+	+	+	+
Catalase activity	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	-	-
Growth at 45°C	+	+	+	+
Growth at 50°C	+	+	+	+
Halotolerance (6.5 %NaCl)	-	-	-	-
Growth at pH 8.8	-	-	-	-
Gas production from glucose	-	-	-	-
Group	II	II	II	II
Reduction of litmus	C,r	C,r	C,r	C,r
Reduction of methylene blue	-	-	-	-
NH ₃ production from arginine	-	-	-	-
Utilization of citrate	-	-	-	-
Rhamnose	-	-	-	-
Mannose	-	-	-	-
Sucrose	+	+	+	+
Maltose	-	-	-	-
Lactose	+	+	+	+
Starch	-	-	-	-
Inulin	-	-	-	-
Mannitol	-	-	-	-
Salicin	-	-	-	-
Fructose	-	-	-	-
Galactose	-	-	-	-
Identified as	<i>S. thermophilus</i>	<i>S. thermophilus</i>	<i>S. thermophilus</i>	<i>S. thermophilus</i>

17/4* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose		
7	L-Xylose			32	Trehalose	5	5
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	3	3	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 20

Period – September, 1997

Region – PETROHAN

Plant – Lopen

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	20/2	20/4	20/6
Media of isolation	MRS	M17	BCP
Gr (+/-)	+	+	+
Catalase activity	+	-	-
Haemolysis	-	-	Wα
Growth at 10°C (7-12)	+	+	+
Growth at 45°C	+	+	+
Halotolerance (6.5 %NaCl)	-	+	+
Growth at pH 8.8	-	+	+
Gas production from glucose	-	-	-
<i>Group</i>			
Reduction of litmus	+	+	C,r
Reduction of methylene blue	+	+	+
NH ₃ production from arginine	+	+	+
Utilization of citrate	-	-	+

Sample № 28

Period – September, 1997

Region – BANSKO

Plant – Fruit (red)

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	28/1	28/2	28/3	28/4	28/5	28/6
Media of isolation	MRS	MI7	TJA	BCP	(Elliker, TTC, 10%NFEM)	(Elliker, TTC, 10%NFEM)
Gr (+/-)	+	+	+	+	+	+
Catalase activity	+	-	-	-	-	-
Haemolysis	Wα	Wα	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+	+	+
Growth at 45°C	+	+	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+	+	+
Growth at pH 8.8	-	-	-	-	-	-
Gas production from glucose	-	-	-	-	-	-
<i>Group</i>						
Reduction of litmus	r	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+	+
Utilization of citrate	+	+	-	+	+	+

CHARACTERISTICS, №	28/7	28/8	28/9	28/10	28/11
Media of isolation	MRS	BCP	MRS	RSL	(Elliker, TTC, 10%NFEM)
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	-	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+	+
Growth at 45°C	+	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+	+
Growth at pH 8.8	-	-	-	-	-
Gas production from glucose	-	-	-	-	-
<i>Group</i>					
Reduction of litmus	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+
Utilization of citrate	+	+	+	+	+

Sample № 29

Period – September, 1997

Region – BANSKO

Plant – Shipka

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	29/3	29/13
Media of isolation	TJA	(Elliker, TTC, 10%NFM)
Gr (+/-)	+	+
Catalase activity	-	-
Haemolysis	-	-
Growth at 10°C (7-12)	+	+
Growth at 45°C	+	+
Halotolerance (6.5 %NaCl)	+	-
Growth at pH 8.8	-	-
Gas production from glucose	-	-
<i>Group</i>		
Reduction of litmus	C,r	C
Reduction of methylene blue	+	+
NH ₃ production from arginine	+	+
Utilization of citrate	-	+

Sample № 31**Period – September, 1997****Region – BANSKO****Plant – Debela mara****Physiological and biochemical characteristics of *Streptococcus/Lactococcus***

CHARACTERISTICS, №	31/2	31/4	31/5	31/6	31/7
Media of isolation	M17	RSL	MRS	M17	RSL
Gr (+/-)	+	+	+	+	+
Catalase activity	+	-	-	-	-
Haemolysis	-	-	-	-	-
Growth at 10°C (7-12)	-	-	+	+	+
Growth at 45°C	+	+	+	+	-
Halotolerance (6.5 %NaCl)	+	+	+	+	-
Growth at pH 8.8	±w	-	-	-	±w
Gas production from glucose	-	-	-	-	-
Group					
Reduction of litmus	C,r	+	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	-	+
NH₃ production from arginine	+	+	+	-	+
Utilization of citrate	-	-	+	+	+

Sample № 32

Period – September, 1997

Region – BANSKO

Plant – Wild rose

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	32/3
Media of isolation	TJA
Gr (+/-)	+
Catalase activity	-
Haemolysis	-
Growth at 10°C (7-12)	+
Growth at 45°C	+
Halotolerance (6.5 %NaCl)	+
Growth at pH 8.8	+
Gas production from glucose	-
<i>Group</i>	
Reduction of litmus	C,r
Reduction of methylene blue	+
NH ₃ production from arginine	+
Utilization of citrate	-

Sample № 33

Period – September, 1997

Region – BANSKO

Plant – Moss

Physiological and biochemical characteristics of *Streptococcus Lactococcus*

CHARACTERISTICS, №	33/3	33/4*	33/6	33/7	33/8
Media of isolation	TJA	BCP	M17	BCP	(Eliker, TTC, 10%NFM)
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	+w	+w	-
Haemolysis	ngr	ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	-	-	-
Growth at 45°C	+	+	+	+	+
Growth at 50°C	+	+	+	+	+
Halotolerance (6.5 %NaCl)	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-
Gas production from glucose	-	-	-	-	-
Group	II	II	II	II	II
Reduction of litmus	C	C	C	+	C,r
Reduction of methylene blue	-	-	-	-	-
NH ₃ production from arginine	-	-	-	-	-
Utilization of citrate	-	-	-	-	-
Rhamnose	-	-	-	-	-
Mannose	-	-	-	-	-
Sucrose	+	+	-	-	-
Maltose	-	-	-	-	-
Lactose	+	+	-	-	-
Starch	-	-	-	-	-
Inulin	-	-	-	-	-
Mannitol	-	-	-	-	-
Salicin	-	-	-	-	-
Fructose	-	-	-	-	-
Galactose	-	-	-	-	-
Identified as	<i>S. thermophilus</i>	<i>S. thermophilus</i>			

33/4* API 50 CH (bio Mérieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	4	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 33

Period – September, 1997

Region – BANSKO

Plant – Moss

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	33/10	33/11	33/12	33/13
Media of isolation	RSL	MRS	RSL	(Eliker, TTC, 10%NFMD)
Gr (+/-)	+	+	+	+
Catalase activity	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	+	+
Growth at 45°C	+	+	+	+
Growth at 50°C	+	+		+
Halotolerance (6.5 %NaCl)	-	-	+	+
Growth at pH 8.8	-	-	-	-
Gas production from glucose	-	-	-	-
<i>Group</i>	II	II		
Reduction of titmus	+	C,r	C,r	C,r
Reduction of methylene blue	-	-	+	+
NH ₃ production from arginine	-	-	+	+
Utilization of citrate	-	-	+	+
Rhamnose	-	-		
Mannose	-	-		
Sucrose	+	+		
Maltose	-	-		
Lactose	+	+		
Starch	-	-		
Inulin	-	-		
Mannitol	-	-		
Salicin	-	-		
Fructose	-	-		
Galactose	-	-		
Identified as	<i>S. thermophilus</i>	<i>S. thermophilus</i>		

Sample № 34

Period – September, 1997

Region – BANSKO

Plant – Wilde rose, flower

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	34/1	34/2	34/3	34/4	34/5	34/6
Media of isolation	MRS	M17	BCP	RSL	MRS	M17
Gr (+/-)	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-
Haemolysis	-	-	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+	-	+
Growth at 45°C	+	+	+	+	+	+
Growth at 50°C					+	
Halotolerance (6.5 %NaCl)	+	+	+	+	-	+
Growth at pH 8.8	+	+	+	+	-	+
Gas production from glucose	-	-	-	-	-	-
<i>Group</i>					II	
Reduction of litmus	C,r	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	-	+
NH ₃ production from arginine	+	+	+	+	-	+
Utilization of citrate	-	-	-	-	-	-
Rhamnose					-	
Mannose					-	
Sucrose					+	
Maltose					-	
Lactose					+	
Starch					-	
Inulin					-	
Mannitol					-	
Salicin					-	
Fructose					-	
Galactose					-	
Identified as					<i>S. thermophilus</i>	

Sample № 35

Period – September, 1997

Region – BANSKO

Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	35/1	35/2	35/3	35/4
Media of isolation	MRS	M17	BCP	RSL
Gr (+/-)	+	+	+	+
Catalase activity	-	-	-	-
Haemolysis	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+
Growth at 45°C	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+
Growth at pH 8.8	-	-	-	-
Gas production from glucose	-	-	-	-
<i>Group</i>				
Reduction of litmus	C	C _r	C _r	C _r
Reduction of methylene blue	+	+	+	+
NH ₃ production from arginine	+	+	+	-
Utilization of citrate	-	-	-	-

Sample № 36

Period – September, 1997

Region – BANSKO

Plant – unknown

Physiological and biochemical characteristics of *Streptococcus Lactococcus*

CHARACTERISTICS, №	36/1	36/2	36/3	36/4	36/5	36/6	36/7
Media of isolation	MRS	M17	BCP	RSL	MRS	M17	BCP
Gr (+/-)	+	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-	-
Haemolysis	-	-	-	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+	+	-	+
Growth at 45°C	+	+	+	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+	+	+	+
Growth at pH 8.8	+	+	tw	+	-	-	-
Gas production from glucose	-	-	-	-	-	-	-
<i>Group</i>							
Reduction of litmus	C,r	C,r	C,r	C,r	C,r	r(24h)	C,r
Reduction of methylene blue	+	+	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+	+	+
Utilization of citrate	-	-	+	-	+	+	+

Sample № 37

Period – September, 1997

Region – BANSKO

Plant – Cikoria

Physiological and biochemical characteristics of *Streptococcus Lactococcus*

CHARACTERISTICS, №	37/6	37/7*	37/8	37/9*	37/10	37/11
Media of isolation	M17	BCP	(Eliker, TTC, 10%NFM)	MRS	MRS	RSL
Gr (+/-)	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr	-	-
Growth at 10°C (7-12)	-	-	+	+	-	+
Growth at 45°C	+	+	+w	+	+	+
Growth at 50°C	+	+		+		
Halotolerance (6.5 %NaCl)	-	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-	-
Gas production from glucose	ngr	ngr	ngr	ngr	-	-
Group	II	II	II?	?		
Reduction of litmus	C,r	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	-	+
NH ₃ production from arginine	+	+	+	+	-	+
Utilization of citrate	-	-	-	-	-	-
Rhamnose	-	-				
Mannose	-	-				
Sucrose	+	+				
Maltose	-	-				
Lactose	+	+				
Starch	-	-				
Inulin	-	-				
Mannitol	-	-				
Salicin	-	-				
Fructose	-	-				
Galactose	-	-				
Identified as	<i>S. thermophilus</i>	<i>S. thermophilus</i>				

37/7* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose			36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

37/9*

Substrat	n 1	n 2	n 3
Rhamnose	-	-	-
Mannose	-	+w	-
Sucrose	-	-	-
Maltose	-	-	-
Lactose	+	+	+
Starch	-	-	-
Inulin	-	-	-
Mannitol	-	-	-
Salicin	-	-	-
Fructose	-	+	-
Galactose	-	-	-

After three times sugar fermentation test we isolated new colony and tested by API 50 CH test.

37/9* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	1	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose		
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	4	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 38

Period – September, 1997

Region – BANSKO

Plant – Див карамфил

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	38/2	38/5	38/6	38/10	38/11
Media of isolation	M17	(Elliker, TTC, 10%NFM)	M17	MRS	M17
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	-	ngr	ngr	-	-
Growth at 10°C (7-12)	+	+	+	+	+
Growth at 45°C	+	+	+	+	+
Halotolerance (6.5 %NaCl)	tw	-	-	+	+
Growth at pH 8.8	-	-	-	-	+
Gas production from glucose	ngr	ngr	-	-	-
Group	II?				
Reduction of litmus	C,r	+	C,r	C,r	C,r
Reduction of methylene blue	+	-	+	+	+
NH ₃ production from arginine	+	-	-	+	+
Utilization of citrate	+	-	+	+	+

Sample № 39

Period – September, 1997

Region – BANSKO

Plant – Жълт кантарион

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	39/2	39/3	39/4	39/5	39/6	39/7
Media of isolation	M17	BCP	RSL	MRS	M17	BCP
Gr (+/-)	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-
Haemolysis	-	-	-	-	-	-
Growth at 10°C (7-12)	+	+	+	+	+	+
Growth at 45°C	+	+	+	+	+	+
Halotolerance (6.5 %NaCl)	-	+	+	+	+	+
Growth at pH 8.8	-	+w	+	-	-	-
Gas production from glucose	-	-	-	-	-	-
<i>Group</i>						
Reduction of litmus	C,r	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+	+
Utilization of citrate	+	+	-	+	+	+

Sample № 40

Period – September, 1997

Region – BANSKO

Plant – Бял равнец

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	40/1	40/2	40/3	40/4	40/5	40/5/1	40/6	40/7
Media of isolation	MRS	M17	BCP	MRS	M17	M17	BCP	RSL
Gr (+/-)	+	+	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-	-	-
Haemolysis	-	-	-	-	-	-	-	α
Growth at 10°C (7-12)	+	+	+	+	+	+	+	+
Growth at 45°C	+	+	+	+	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+	+	+	+w	+
Growth at pH 8.8	-	+w	+	-	+w	-	+w	-
Gas production from glucose	-	-	-	-	-	-	-	-
Group								
Reduction of litmus	C,r	C	C	C,rw	C,r	C,r	r	+
Reduction of methylene blue	+	+	+	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+	+	+	+
Utilization of citrate	+	+	-	+	+	+	+	+

Sample № 42

Period – September, 1997

Region – BANSKO

Plant – Овчарска торбичка

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	42/4	42/6	42/8	42/11	42/12
Media of isolation	BCP	M17	BCP	MRS	RSL
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	α w	ngr	ngr	-	-
Growth at 10°C (7-12)	+	-	-	+	+
Growth at 45°C	+	+	+	+	+
Growth at 50°C		+			
Halotolerance (6.5 %NaCl)	+	-	-	+	+
Growth at pH 8.8	+	-	-	-	-
Gas production from glucose	-	-	-	-	-
Group		II	II		
Reduction of litmus	+	C	C _{rw}	C _{rw}	C _{rw}
Reduction of methylene blue	+	-	-	+	+
NH ₃ production from arginine	+	ngr	ngr	+	+
Utilization of citrate	-	-	-	+	+
Rhamnose		-			
Maanose		-			
Sucrose		+			
Maltose		-			
Lactose		+			
Starch		-			
Inulin		-			
Mannitol		-			
Salicin		-			
Fructose		-			
Galactose		-			
Identified as		<i>S. thermophilus</i>			

Sample № 43

Period – September, 1997

Region – BANSKO

Plant – Мравуняк

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	43/1	43/1/1	43/2
Media of isolation	M17	M17	BCP
Gr (+/-)	+	+	+
Catalase activity	-	-	-
Haemolysis	-	-	-
Growth at 10°C (7-12)	+	+	+
Growth at 45°C	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+
Growth at pH 8.8	-	-	-
Gas production from glucose	-	-	-
<i>Group</i>			
Reduction of litmus	C _{1,rw}	C _{1,rw}	C _{1,r}
Reduction of methylene blue	+	+	+
NH ₃ production from arginine	+	+	+
Utilization of citrate	+	+	+

Sample № 44

Period – September, 1997

Region – BANSKO

Source - Сурово краве мляко

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	44/1	44/2
Media of isolation	MRS	M17
Gr (+/-)	+	+
Catalase activity	-	-
Haemolysis	-	-
Growth at 10°C (7-12)	+	+
Growth at 45°C	+	+
Halotolerance (6.5 %NaCl)	+	+
Growth at pH 8.8	-	-
Gas production from glucose	-	-
<i>Group</i>		
Reduction of litmus	C,r	C,rw
Reduction of methylene blue	+	+
NH ₃ production from arginine	+	+
Utilization of citrate	+	+

Sample № 45

Period – September, 1997

Region – BANSKO

Source – Сурово овче мляко

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	45/5	45/6	45/7	45/8	45/9	45/10	45/11	45/12
Media of isolation	(Eliker, TTC, 10%NFEM)	M17	BCP	(Eliker, TTC, 10%NFEM)	MRS	MRS	RSL	(Eliker, TTC, 10%NFEM)
Gr (+/-)	+	+	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr	ngr	αw	αw	αw
Growth at 10°C (7-12)	-	-	-	+w	+w	+	+	+
Growth at 45°C	+	+	+	+	+	+	+	+
Growth at 50°C	-	+	-	-	-	-	-	-
Halotolerance (6.5 %NaCl)	-	-	-	-	-	+w	-	+
Growth at pH 8.8	-	-	-	-	-	-	-	+w
Gas production from glucose	-	-	-	-	-	-	-	-
Group	II	II	II	?II	?II			
Reduction of litmus	r	+	C,r	+	C,r	C,r	C,r	C,r
Reduction of methylene blue	-	+	+(without coagulation)	+	+	+	+	+
NH ₃ production from arginine	ngr	ngr	ngr	ngr	ngr	+	+	+
Utilization of citrate	-	-	-	-	-	+	+	+
Rhamnose	-	-	-	-	-	-	-	-
Mannose	-	-	-	-	-	-	-	-
Sucrose	-	+	+	-	-	-	-	-
Maltose	-	-	-	-	-	-	-	-
Lactose	-	+	+	-	-	-	-	-
Starch	-	-	-	-	-	-	-	-
Inulin	-	-	-	-	-	-	-	-
Mannitol	-	-	-	-	-	-	-	-
Salicin	-	-	-	-	-	-	-	-
Fructose	-	-	-	-	-	-	-	-
Galactose	-	-	-	-	-	-	-	-
Identified as		<i>S. thermophilus</i>	<i>S. thermophilus</i>					

Sample № 54
Period – September, 1997
Region – RUPITE
Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	54/1	54/2	54/3	54/4	54/6
Media of isolation	MRS	M17	BCP	RSL	M17
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	-	-	-	αW	αW
Growth at 10°C (7-12)	+	+	+	+	+
Growth at 45°C	+	+	+	+	+
Halotolerance (6.5 %NaCl)	+	+	+	+	+
Growth at pH 8.8	+	+	+	+	+
Gas production from glucose	-	-	-	-	-
<i>Group</i>					
Reduction of litmus	C,r	C,r	C,r	C,r	C,r
Reduction of methylene blue	+	+	+	+	+
NH ₃ production from arginine	+	+	+	+	+
Utilization of citrate	-	-	-	-	-

Sample № 55

Period – September, 1997

Region – RUPITE

Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	55/4	55/8
Media of isolation	RSL	RSL
Gr (+/-)	+	+
Catalase activity	-	-
Haemolysis	-	-
Growth at 10°C (7-12)	+	+
Growth at 45°C	+	+
Halotolerance (6.5 %NaCl)	+	-
Growth at pH 8.8	+	-
Gas production from glucose	-	-
<i>Group</i>		
Reduction of litmus	C,r	C,r
Reduction of methylene blue	+	+
NH ₃ production from arginine	+	+
Utilization of citrate	-	+

Sample № 64

Period – September, 1997

Region – Shiroka Laka

Plant – Хризантема

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	64/6	64/7	64/8*	64/9	64/11
Media of isolation	M17	(Eliker, TTC, 10%NFEN)	MRS	BCP	RSL
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr	αw
Growth at 10°C (7-12)	-	-	-	-	+
Growth at 45°C	+	+	+	+	+
Growth at 50°C	-	-	+	+	-
Halotolerance (6.5 %NaCl)	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-
Gas production from glucose	-	-	-	-	-
Group	II	II	II	II	
Reduction of litmus	+	C	C	C	C,r
Reduction of methylene blue	-	+	-	-	+
NH ₂ production from arginine	ngr	ngr	ngr	ngr	+
Utilization of citrate	-	-	-	-	+
Rhamnose			-	-	
Mannose			-	-	
Sucrose			+	+	
Maltose			-	-	
Lactose			+	+	
Starch			-	-	
Inulin			-	-	
Mannitol			-	-	
Salicin			-	-	
Fructose			-	-	
Galactose			-	-	
<i>Identified as</i>			<i>S. thermophilus</i>	<i>S. thermophilus</i>	

64/8* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	2	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	4	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	2	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 65

Period – September, 1997

Region – Shiroka Laka

Plant – Zokum

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	65/8*
Media of isolation	(Elliker, TTC, 10%NFM)
Gr (+/-)	+
Catalase activity	-
Haemolysis	ngr
Growth at 10°C (7-12)	-
Growth at 45°C	+
Growth at 50°C	+
Halotolerance (6.5 %NaCl)	-
Growth at pH 8.8	-
Gas production from glucose	-
Group	II
Reduction of litmus	C,r
Reduction of methylene blue	-
NH ₃ production from arginine	ngr
Utilization of citrate	-
Rhamnose	-
Mannose	-
Sucrose	+
Maltose	-
Lactose	+
Starch	-
Inulin	-
Mannitol	-
Salicin	-
Fructose	-
Galactose	-
<i>Identified as</i>	<i>S. thermophilus</i>

65/8* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 66

Period – September, 1997

Region – Shiroka Laka

Plant – Brashlian

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	66/1	66/2*	66/10
Media of isolation	MRS	M17	BCP
Gr (+/-)	+	+	+
Catalase activity	-	-	-
Haemolysis	ngr	ngr	-
Growth at 10°C (7-12)	+	-	-
Growth at 45°C	+	+	+
Growth at 50°C	-	+	+
Halotolerance (6.5 %NaCl)	-	-	-
Growth at pH 8.8	-	-	-
Gas production from glucose	-	-	-
Group		II	II
Reduction of litmus	+	+	C
Reduction of methylene blue	+	-	+
NH ₃ production from arginine	ngr	ngr	ngr
Utilization of citrate	-	-	-
Rhamnose	-	-	-
Mannose	-	-	-
Sucrose	-	+	+
Maltose	-	-	-
Lactose	-	+	+
Starch	-	-	-
Inulin	-	-	-
Mannitol	-	-	-
Salicin	-	-	-
Fructose	-	-	-
Galactose	-	-	-
Identified as		<i>S. thermophilus</i>	<i>S. thermophilus</i>

66/2* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	3	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 67

Period – September, 1997

Region – Shiroka Laka

Plant – Latinka

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	67/1	67/2	67/3	67/4*	67/5
Media of isolation	MRS	M17	TJA	BCP	(Eliker, TTC, 10%NFEM)
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis		ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	-	-	-
Growth at 45°C	+	+	+	+	+
Growth at 50°C		+			+
Halotolerance (6.5 %NaCl)	-	-			-
Growth at pH 8.8	-	-			-
Gas production from glucose	-	-	-	-	-
Group	II	II	II	II	II
Reduction of litmus	C,rw	ngr	C,r	C,rw	ngr
Reduction of methylene blue	-	-	-	-	+
NH ₃ production from arginine	ngr	-	ngr	ngr	ngr
Utilization of citrate	-	-	-	-	-
Rhamnose	-			-	
Mannose	-			-	
Sucrose	+			+	
Maltose	-			-	
Lactose	+			+	
Starch	-			-	
Inulin	-			-	
Mannitol	-			-	
Salicin	-			-	
Fructose	-			-	
Galactose	-			-	
Identified as	<i>S. thermophilus</i>			<i>S. thermophilus</i>	

67/4* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellulose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccarose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	2	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbose			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Lyxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 67
 Period – September, 1997
 Region – Shiroka Laka
 Plant – Latinka

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	67/7	67/8	67/10	67/11
Media of isolation	M17	(Eliker, TTC, 10%NFM)	MRS	(Eliker, TTC, 10%NFM)
Gr (+/-)	+	+	+	+
Catalase activity	-	-	-	-
Haemolysis	ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	-	-
Growth at 45°C	+	+	-	+
Growth at 50°C	-	+	-	+
Halotolerance (6.5 %NaCl)	-	-	-	-
Growth at pH 8.8	-	-	-	-
Gas production from glucose	-	-	-	-
Group	II	II	I	II
Reduction of litmus	ngr	C, rw	C	C
Reduction of methylene blue	+	-	+	+
NH ₃ production from arginine	ngr	ngr	ngr	-
Utilization of citrate	-	-	-	-
Rhamnose	-	-	-	-
Mannose	-	-	-	-
Sucrose	-	+	-	+
Maltose	-	-	-	-
Lactose	-	+	-	+
Starch	-	-	-	-
Inulin	-	-	-	-
Mannitol	-	-	-	-
Salicin	-	-	-	-
Fructose	-	-	-	-
Galactose	-	-	-	-
<i>Identified as</i>		<i>S. thermophilus</i>		<i>S. thermophilus</i>

Sample № 68

Period – September, 1997

Region – Shiroka Laka

Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	68/1	68/2	68/3	68/4	68/5*
Media of isolation	MRS	M17	TJA	BCP	(Eliker, TTC, 10%NFMD)
Gr (+/-)	+	+	+	+	+
Catalase activity	-	-	-	-	-
Haemolysis	ngr	ngr	-	-	ngr
Growth at 10°C (7-12)	-	+w	-	-	-
Growth at 45°C	+	+	+	+	+
Growth at 50°C	+			+	+
Halotolerance (6.5 %NaCl)	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-
Gas production from glucose	-	-	-	-	-
<i>Group</i>	II	II?	II	II	II
Reduction of litmus	C	C,rw	C	C,rw	C
Reduction of methylene blue	+	+	+	+	+
NH ₃ production from arginine	-	ngr	ngr	ngr	ngr
Utilization of citrate	-	-	-	-	-
Rhamnose	-			-	-
Mannose	-			-	-
Sucrose	+			+	+
Maltose	-			-	-
Lactose	+			+	+
Starch	-			-	-
Inulin	-			-	-
Mannitol	-			-	-
Salicin	-			-	-
Fructose	-			-	-
Galactose	-			-	-
<i>Identified as</i>	<i>S. thermophilus</i>			<i>S. thermophilus</i>	<i>S. thermophilus</i>

68/5* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	5	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 68

Period – September, 1997

Region – Shiroka laka

Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	68/6	68/7*	68/8	68/9
Media of isolation	MRS	M17	(Eliker, TTC, 10%NFM)	BCP
Gr (+/-)	+	+	+	+
Catalase activity	-	-	-	-
Haemolysis	Ngr	ngr	ngr	ngr
Growth at 10°C (7-12)	-	-	-	-
Growth at 45°C	+	+	+	+
Growth at 50°C	+	+	+	
Halotolerance (6.5 %NaCl)	-	-	-	-
Growth at pH 8.8	-	-	-	-
Gas production from glucose	-	-	-	-
Group	II	II	II	II
Reduction of litmus	+	C,r	C	C
Reduction of methylene blue	+	-	+ (without coagulation)	+
NH ₃ production from arginine	ngr	-	ngr	ngr
Utilization of citrate	-	-	-	-
Rhamnose	-	-	-	
Mannose	-	-	-	
Sucrose	+	+	+	
Maltose	-	-	-	
Lactose	+	+	+	
Starch	-	-	-	
Inulin	-	-	-	
Mannitol	-	-	-	
Salicin	-	-	-	
Fructose	-	-	-	
Galactose	-	-	-	
Identified as	<i>S. thermophilus</i>	<i>S. thermophilus</i>	<i>S. thermophilus</i>	

68/7* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	5	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Sample № 69

Period – September, 1997

Region – Shiroka laka

Plant – unknown (same as Nr 68)

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	69/1	69/2	69/3*	69/4	69/5	69/12	69/13*
Media of isolation	MRS	M17	TJA	BCP	(Eliker, TTC, 10%NFM)	RSL	(Eliker, TTC, 10%NFM)
Gr (+/-)	+	+	+	+	+	+	+
Catalase activity	-	-	-	-	-	-	-
Haemolysis	ngr	ngr	ngr	+/-	ngr	-	+/-
Growth at 10°C (7-12)	-	-	-	+	-	+	+
Growth at 45°C	+	+	+	tw	+	-	-
Growth at 50°C	-	-	+	-	+	-	-
Halotolerance (6.5 %NaCl)	-	-	-	-	-	-	-
Growth at pH 8.8	-	-	-	-	-	-	tw?
Gas production from glucose	-	-	-	-	-	-	-
Group	II	II	II		II	IV	IV
Reduction of litmus	C	C,r	C,rw	C,r	C,r	+	C,r
Reduction of methylene blue	+	-	+	+	+	+	+
NH ₃ production from arginine	ngr	-	-	+	ngr	+	+
Utilization of citrate	-	-	-	+	-	+	+
Rhamnose							
Mannose							+
Sucrose			+		+		+
Maltose			-		-		+
Lactose			+		+		+
Starch			-		-		-
Inulin			-		-		-
Mannitol			-		-		+
Salicin			-		-		+
Fructose			-		-		+
Galactose			-		-		+
<i>Identified as</i>			<i>S. thermophilus</i>		<i>S. thermophilus</i>		<i>Lc. lactis</i>

69/3* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Physiological and biochemical characteristics of Lactobacilli

Characteristics	69/6	69/10	69/8	69/9	69/11
Catalase activity	-	-	-	-	-
Growth at 15°C	-	-	-	-	-
Growth at 45°C	+	-	-	-	-
Gas production from glucose	-	-	-	-	-
Lactic acid isomer	D(-)	-	-	-	-

69/6* API 50 CH (bio Merieux)

N	Substrat	4 h	24 h	N	Substrat	4 h	24 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	3	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose		
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	2	5	36	Amidon		
12	D-Fructose		4	37	Glycogene		
13	D-Mannose	2	5	38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

69/6* Enzyme activity - API ZYM (bio Merieux)

Enzyme	MRS agar 48h, 37°C
2. Phosphatase alcaline	0
3. Esterase (C4)	+
4. Esterase Lipase (C8)	0
5. Lipase (C14)	+
6. Leucine arylamidase	5
7. Valine arylamidase	1
8. Cystine arylamidase	2
9. Trypsin	0
10. Chymotrypsin	0
11. Phosphatase acid	4
12. Naphthol-AS-BI-phosphohydrolase	4
13. α -galactosidase	+
14. β -galactosidase	5
15. β -glucuronidase	0
16. α -glucosidase	+
17. β -glucosidase	0
18. N-acetyl-glucosaminidase	0
19. α - mannosidase	0
20. α - fucosidase	0

69/6* Biochemical characteristics during 18 and 48 h incubation at 37 or 45°C

Characteristics	37°C, 1% inoculum	18 h		48 h	
	0 h	37°C	45°C	37°C	45°C
Cfu/ml	2.5x10 ⁶	6.1x10 ⁷	8.5x10 ⁷	4.5x10 ⁷	1x10 ⁸
Acidity, °T	20	138	164	184	182
Acidity, pH	6.4	3.8	3.7	3.7	3.7
Lactic acid		1.24	1.48	1.66	1.64
D(-) isomer, %	0	1.08	1.29	1.38	1.37
L(+) isomer, %	0	0	0	0	0.02
Lactose	5.096-Boehringer 5.64-Shorl	2.4	2.37	2.24	2.1
Glucose	0	0	0.05	0.04	0.06
Galactose	0.04	1.16	1.35	1.49	1.50
Kinematic viscosity		1.12	1.09	1.1266	1.0966
Proteolytic activity*		10.8	13.4	13.3	14.9
Whey separation		35.4	42.3	25.7	38.4

*mg L-tyrosine/100g

Total solid of the milk – 10.3

69/13* API 50 CH (bio Merieux)

N	Substrat	72 h	N	Substrat	72 h
0	Control		25	Esculine	5
1	Glycerol		26	Salicine	4
2	Erythritol		27	Cellobiose	5 gas
3	D-Arabinose		28	Maltose	5
4	L-Arabinose		29	Lactose	5
5	Ribose	5	30	Melibiose	
6	D-Xylose	5	31	Saccharose	5
7	L-Xylose		32	Trehalose	5
8	Adonitol		33	Inuline	
9	Methyl-xylozide		34	Melezitose	
10	Galactose	4	35	D-Raffinose	
11	D-Glucose	5	36	Amidon	
12	D-Fructose	5	37	Glycogene	
13	D-Mannose	5	38	Xylitol	
14	L-Sorbrse		39	Gentiobiose	4
15	Rhamnose		40	D-Turanose	
16	Dulcitol		41	D-Luxose	
17	Inositol		42	D-Tagatose	
18	Mannitol	4	43	D-Fructose	
19	Sorbitol		44	L-Fucose	
20	Methyl-D-Mannoside		45	D-Arabitol	
21	Methyl-D-Glucoside		46	L-Arabitol	
22	N Acetyl glucosamine	4	47	Gluconate	3 gas
23	Amigdaline	3	48	2 ceto gluconate	
24	Arbutine	4	49	5 ceto gluconate	

Sample № 70 (II)
 Period – September, 1997
 Region – BANSKO
 Plant – unknown

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	II/2*	II/4*	II/5*
Media of isolation	M17	BCP	M17
Gr (+/-)	+	+	+
Catalase activity	-	-	-
Haemolysis	ngr	-	-
Growth at 10°C (7-12)	-	+	+
Growth at 45°C	+	-	-
Growth at 50°C	+	-	-
Halotolerance (6.5 %NaCl)	-	-	-
Growth at pH 8.8	-	-	-
Gas production from glucose	-	-	-
<i>Group</i>	II	IV	IV
Reduction of litmus	C,r	C,r	C,r
Reduction of methylene blue	+	+	+
NH ₃ production from arginine	-	+	+
Utilization of citrate	-	+	+
Rhamnose	-	-	-
Mannose	-	+	-
Sucrose	+	-	-
Maltose	-	-	-
Lactose	+	+	-
Starch	-	-	-
Inulin	-	-	-
Mannitol	-	+	-
Salicin	-	+	-
Fructose	-	+	-
Galactose	-	+	-
<i>Identified as</i>	<i>S. thermophilus</i>	<i>Lc. lactis</i>	<i>Lc. lactis</i>

II/2* API 50 CH (bio Merieux)

N	Substrat	24 h	72 h	N	Substrat	24 h	72 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	4	4
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose	5	5
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	3	5	36	Amidon		
12	D-Fructose			37	Glycogene		
13	D-Mannose			38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

Physiological and biochemical characteristics of Lactobacilli

Characteristics	II3/2
Catalase activity	-
Growth at 15°C	-
Growth at 45°C	+
Gas production from glucose	-
Lactic acid isomer	D(-)

II3/2* API 50 CH (bio Merieux)

N	Substrat	4 h	24 h	N	Substrat	4 h	24 h
0	Control			25	Esculine		
1	Glycerol			26	Salicine		
2	Erythritol			27	Cellobiose		
3	D-Arabinose			28	Maltose		
4	L-Arabinose			29	Lactose	+	5
5	Ribose			30	Melibiose		
6	D-Xylose			31	Saccharose		
7	L-Xylose			32	Trehalose		
8	Adonitol			33	Inuline		
9	Methyl-xylozide			34	Melezitose		
10	Galactose			35	D-Raffinose		
11	D-Glucose	3	5	36	Amidon		
12	D-Fructose		5	37	Glycogene		
13	D-Mannose	3	5	38	Xylitol		
14	L-Sorbrse			39	Gentiobiose		
15	Rhamnose			40	D-Turanose		
16	Dulcitol			41	D-Luxose		
17	Inositol			42	D-Tagatose		
18	Mannitol			43	D-Fructose		
19	Sorbitol			44	L-Fucose		
20	Methyl-D-Mannoside			45	D-Arabitol		
21	Methyl-D-Glucoside			46	L-Arabitol		
22	N Acetyl glucosamine			47	Gluconate		
23	Amigdaline			48	2 ceto gluconate		
24	Arbutine			49	5 ceto gluconate		

113/2* Enzyme activity - API ZYM (bio Merieux)

Enzyme	MRS agar 48h, 37°C
2. Phosphatase alcaline	0
3. Esterase (C4)	+
4. Esterase Lipase (C8)	+
5. Lipase (C14)	+
6. Leucine arylamidase	1
7. Valine arylamidase	+
8. Cystine arylamidase	+
9. Trypsin	0
10. Chymotrypsin	0
11. Phosphatase acid	1
12. Naphthol-AS-BI-phosphohydrolase	1
13. α -galactosidase	0
14. β -galactosidase	4
15. β -glucuronidase	0
16. α -glucosidase	0
17. β -glucosidase	0
18. N-acetyl--glucosaminidase	0
19. α - mannosidase	0
20. α - fucosidase	0

II3/2* Biochemical characteristics after 18 and 48 h incubation at 37 and 45°C

Characteristics	37°C, 1% inoculum	18 h		48 h	
	0 h	37°C	45°C	37°C	45°C
Cfu/ml	1,1x10 ⁷	4,1x10 ⁹	1,2x10 ⁷	9,8x10 ⁷	1,2x10 ⁶
Acidity, °T	21	160	158	186	158
Acidity, pH	6.45	3,9	3,92	3,77	3,93
Lactic acid				1,67	1,64
D(-) isomer, %	0			74,85	0
L(+) isomer, %	0			0	1,37
Lactose	4,98-Boehringer			2,39	2,1
Glucose	0			0,0	0,06
Galactose	0,06			1,28	1,50
Kinematic viscosity		1,0870	1,0585	1,0643	1,0900
Proteolytic activity*	12,0	11,2	12,7	13,2	16,2
Whey separation, %		24,6	30,8	17,9	23,9
Acetaldehyd, mg/kg	0,3	15,2	13,1	14,1	11,9
Aceton, mg/kg	0,43	0,72	0,81	0,78	0,88
Ethilacetat, mg/kg	-	-	-	-	-
Butanon 2, mg/kg	0,07	0,105	0,12	0,121	0,158
Diacetil, mg/kg	-	-	-	-	-
Ethanol, mg/kg	0,1	1,9	0,88	2,13	1,27

*mg L-tyrosine/100g

Total solid of the milk – 10.3

II/4* API 50 CH (bio Merieux)

N	Substrate	4	24	72	N	Substrate	4	24	72
0	Control				25	Esculine	4	5	5
1	Glycerol				26	Salicine	3	4	4
2	Erythritol				27	Cellobiose	4	5	5
3	D-Arabinose				28	Maltose	3	4	4
4	L-Arabinose				29	Lactose		1	4
5	Ribose	3	4	5	30	Melibiose			
6	D-Xylose	3	4	5	31	Saccharose	4	5	5
7	L-Xylose				32	Trehalose	3	4	4
8	Adonitol				33	Inuline			
9	Methyl-xylozide				34	Melezitose			
10	Galactose		4	5	35	D-Raffinose			
11	D-Glucose	4	5	5	36	Amidon			1
12	D-Fructose	4	5	5	37	Glycogene			
13	D-Mannose	4	5	5	38	Xylitol			
14	L-Sorbrse				39	Gentiobiose	3	3.5	4
15	Rhamnose				40	D-Turanose			
16	Dulcitol		g		41	D-Luxose			
17	Inositol		g		42	D-Tagatose			
18	Mannitol		3	5	43	D-Fructose			
19	Sorbitol				44	L-Fucose			
20	Methyl-D-Mannoside				45	D-Arabitol			
21	Methyl-D-Glucoside				46	L-Arabitol			
22	N Acetyl glucosamine	3	4	5	47	Gluconate		2.5	3
23	Amigdaline		3	4	48	2 ceto gluconate			
24	Arbutine	3	4	4	49	5 ceto gluconate			

II/5* API 50 CH (bio Merieux)

N	Substrate	4	24	72	N	Substrate	4	24	72
0	Control				25	Esculine	3	5	5
1	Glycerol				26	Salicine	3	4	4
2	Erythritol				27	Cellobiose		5	5
3	D-Arabinose				28	Maltose		4	4
4	L-Arabinose				29	Lactose		4	4
5	Ribose		4	5	30	Melibiose			
6	D-Xylose		5	5	31	Saccharose		3	5
7	L-Xylose				32	Trehalose		4	4
8	Adonitol				33	Inuline			
9	Methyl-xylozide				34	Melezitose			
10	Galactose		4	5	35	D-Raffinose			
11	D-Glucose	3	5	5	36	Amidon		1	1
12	D-Fructose	3	5	5	37	Glycogene			
13	D-Mannose	3	5	5	38	Xylitol			
14	L-Sorbrse				39	Gentiobiose		3.5	4
15	Rhamnose				40	D-Turanose			
16	Dulcitol				41	D-Luxose			
17	Inositol				42	D-Tagatose			
18	Mannitol		5	5	43	D-Fructose			
19	Sorbitol				44	L-Fucose			
20	Methyl-D-Mannoside				45	D-Arabitol			
21	Methyl-D-Glucoside				46	L-Arabitol			
22	N Acetyl glucosamine	3	4	5	47	Gluconate		3	3
23	Amigdaline		3	4	48	2 ceto gluconate			
24	Arbutine	3	4	4	49	5 ceto gluconate			

Control strains

Lc. lactis N9 – LBB Collection

S. thermophilus 1131 – MEIJI standard strain

Physiological and biochemical characteristics of *Streptococcus/Lactococcus*

CHARACTERISTICS, №	1131	L9*
Gr (+/-)	+	+
Catalase activity	-	-
Haemolysis	ngr	-
Growth at 10°C (7-12)	-	+
Growth at 45°C	+	-
Growth at 50°C	+	-
Halotolerance (6.5 %NaCl)	-	-
Growth at pH 8.8	-	-
Gas production from glucose	-	-
Group	II	IV
Reduction of litmus	+	+
Reduction of methylene blue	-	+ (without coagulation)
NH ₃ production from arginine	-	+
Utilization of citrate	-	-
Rhamnose	-	-
Mannose	-	-
Sucrose	+	-
Maltose	-	-
Lactose	+	-
Starch	-	-
Inulin	-	-
Mannitol	-	-
Salicin	-	-
Fructose	-	-
Galactose	-	-
<i>Identified as</i>	<i>S. thermophilus</i>	<i>Lc. lactis</i>

L. lactis 9* API 50 CH (bio Merieux)

N	Substrate	72 h	N	Substrate	72 h
0	Control		25	Esculine	5
1	Glycerol		26	Salicine	4
2	Erythritol		27	Cellobiose	5
3	D-Arabinose		28	Maltose	3
4	L-Arabinose		29	Lactose	4
5	Ribose	5	30	Melibiose	
6	D-Xylose		31	Saccharose	
7	L-Xylose		32	Trehalose	4
8	Adonitol		33	Inuline	
9	Methyl-xylozide		34	Melezitose	
10	Galactose	5	35	D-Raffinose	
11	D-Glucose	5	36	Amidon	
12	D-Fructose	5	37	Glycogene	
13	D-Mannose	5	38	Xylitol	
14	L-Sorbrse		39	Gentiobiose	1
15	Rhamnose		40	D-Turanose	
16	Dulcitol		41	D-Luxose	
17	Inositol		42	D-Tagatose	
18	Mannitol	5 g	43	D-Fructose	
19	Sorbitol		44	L-Fucose	
20	Methyl-D-Mannoside		45	D-Arabitol	
21	Methyl-D-Glucoside		46	L-Arabitol	
22	N Acetyl glucosamine	4	47	Gluconate	
23	Amigdaline		48	2 ceto gluconate	
24	Arbutine	4	49	5 ceto gluconate	

29.04.1998

Starters preparation

Nr	Combination	Coagulation time	Nr	Combination	Coagulation time
1.	113/2:10/6	2h 45	15.	69/6:10/6	2h 45
2.	113/2:17/4	2h 45	16.	69/6:17/4	2h 45
3.	113/2:33/4	3h 20	17.	69/6:33/4	3h 20
4.	113/2:37/7	2h 45	18.	69/6:37/7	2h 45
5.	113/2:37/9	3h 15	19.	69/6:37/9	3h 30
6.	113/2:64/18	3 h	20.	69/6:64/18	3h 15
7.	113/2:65/8	2h 45	21.	69/6:65/8	3 h
8.	113/2:66/2	3 h	22.	69/6:66/2	3h 20
9.	113/2:67/4	2h 45	23.	69/6:67/4	2h 45
10.	113/2:68/5	3 h	24.	69/6:68/5	3h 20
11.	113/2:69/3	2h 45	25.	69/6:69/3	2h 45
12.	113/2:11/2	2h 45	26.	69/6:11/2	3 h
13.	113/2:11/4	2h 45	27.	69/6:11/4	No coagulation
14.	113/2:11/5	4h 35	28.	69/6:11/5	No coagulation

After checking the morphology of the strains yogurts were prepared with following starters:

Nr	Combination	Incubation time (pH = 4.7)	Remarks
1.	113/2:10/6	2h 50	
2.	113/2:17/4	2h 50	
7.	113/2:65/8	2h 50	
11.	113/2:69/3	2h 50	
15.	69/6:10/6	2h 50	
16.	69/6:17/4	2h 50	
23.	69/6:67/4	2h 50	
25.	69/6:69/3	2h 50	

11.05.1998

Combination	Coagulation time	Microscopic view
69/6:69/5	2h 25, 42°C	Typical
113/2:11/2	2h 25, 42°C	
113/2:11/2:11/4	4h, 37°C	

12.05.1998

Ready product

№	Combination	Incubation time (pH 4.7)	Microscopic view	Acidity, 24h		Texture	Flavour	Aroma	Taste	
				pH	°T					
1.	153:144 (69/6:69/5)	2h30', 42°C	Typical	4.6	87	4	Typical	Typical	Typical	JP
2.	155:150 (113/2:11/2)	2h25, 42°C	Typical	4.5	95	5	Typical	Typical	Typical	BG
3.	155:150:151 (113/2:11/2:11/4)	4h, 37°C	Typical	4.4	97	5	Typical	Typical	Typical	BG

Scale 1-6

中身反ヨークルト
 2.00% の脂肪含有 (1/4)

Quality of yoghurt products on the market

Table.1 Package research

No.	product name	producer	manufacturer date	consumption limit	price (leva)	volume (g)	ingredient	FAT (%)	PROTEIN (%)	CHO (%)
1	Danone	Danone Serdika Sofia	19-Oct	7 days	590	500	cow milk, starter	3.6	3.1	4.6
2	Verea	Serdika St.Zagora	17-Oct	7 days	500	500	—	3.6	3.3	4.7
3	Plovdiv	Mlechina Promishlenost Plovdiv	17-Oct	7 days	500	500	—	3.6	3.3	4.7
4	Montana	Agropromstrou BD & Co Montana	18-Oct	3 days	360	500	—	2.0	—	—
5	Pleven	Pleven Sirma	—	3 days	370	500	—	2.0	—	—

Quality of yoghurt products on the market

(3/4)

Table.2 Quality check of the samples (before storage)

No. product name	Acidity (TH)	Acidity (%)	pH Tor	pH Zeibold	Whey separation (%)	Kinematic viscosity (est)	FAT (%)	ROTEI (%)	SNF (%)	TS (%)	Flavour component				Taste Preference	
											A (ppm)	D (ppm)	Ethanol (ppm)	Aceton (ppm)		Bthanon (ppm)
1 Danone	103	0.91	4.02	4.11	39.71	1.067	4.0	3.09	7.21	11.21	11.30	2.90	10.60	2.45	0.30	good
2 Verea	101	0.91	3.97	3.98	36.97	1.026	4.0	2.97	6.71	10.71	13.10	1.82	10.10	2.30	0.07	very good
3 Plovdiv	120	1.07	3.84	3.91	48.85	1.069	3.2	3.06	7.13	10.33	12.30	0.94	12.44	2.41	0.08	neutral
4 Montana	122	1.09	3.88	3.97	58.13	1.064	2.0	3.00	7.69	9.69	14.30	0.55	5.80	1.38	0.07	very bad
5 Pleven	115	1.03	3.80	3.92	64.82	1.073	2.2	2.78	6.43	8.63	5.71	0.27	14.20	2.01	0.08	very bad

Quality of yoghurt products on the market

(3/4)

Table.3 Microbiological properties of the samples (before storage)

No. product name	The number of lactic acid bacteria (x 10 ⁶ colony forming unit /g)										E.coli		Yeast (/1g)	Fungi (/1g)
	B C P			M R S			M 17		Hinabrown		Liquid Cesler	plate Climer		
	L	S	L	L	S	L	S	L	S					
1 Danone	0.0	50.0	0.0	61.0	0.0	104.0	310.0	(-)	(-)	(-)	(-)	(-)	(-)	
2 Verea	Total 49.2		3.0	2.7	23.0	1.7		(-)	(-)	(-)	10	(-)	(-)	
3 Plovdiv	40.0	31.0	36.5	23.5	37.0	8.0		(-)	(-)	(-)	2860	(-)	(-)	
4 Montana	80.5	10.5	44.0	4.5	33.5	22.0		(-)	(-)	(-)	110	(-)	(-)	
5 Pleven	14.5	9.5	19.5	4.5	8.1	5.0		(-)	(-)	(-)	10	(-)	(-)	

Quality of yoghurt products on the market

(4/4)

Table.4 Preservation test (10°C)

No.	product name	Preservatio period (day)	Acidity (TH)	Acidity (%)	pH	Whey separation (%)	Kinematic viscosity (cst)	The number of Lactic acid bacteria			
								BCP(x 10 ⁷ cfu/g)	MRS(x 10 ⁷ cfu/g)		
								L	S	S	
1	Danone	0	103	0.91	4.11	39.71	1.067	0.0	50.0	0.0	61.0
		14	105	0.95	4.01	38.85	1.064	0.0	6.5	0.0	20.0
		28	106	0.97	3.96	41.63	1.055	0.0	0.7	0.0	0.9
2	Verea	0	101	0.91	3.98	36.97	1.026	Total 49.2		3.0	2.7
		14	134	1.22	3.71	36.50	1.023	1.0	36.2	0.4	4.8
		28	155	1.41	3.56	34.44	1.017	0.0	0.0	0.3	0.1
3	Plovdiv	0	120	1.07	3.91	48.85	1.069	40.0	31.0	36.5	23.5
		14	156	1.35	3.65	43.60	1.074	36.5	1.5	10.5	14.5
		28	168	1.59	3.55	42.02	1.067	8.6	0.1	8.1	0.2
4	Montana	0	122	1.09	3.97	58.13	1.064	80.5	10.5	44.0	4.5
		14	140	1.22	3.79	58.25	1.065	39.0	10.0	4.5	18.0
		28	157	1.38	3.72	56.79	1.058	22.0	0.2	18.5	0.4
5	Pleven	0	115	1.03	3.92	64.82	1.073	14.5	9.5	19.5	4.5
		14	138	1.22	3.68	58.95	1.073	30.5	6.0	27.5	9.5
		28	144	1.38	3.63	67.40	1.063	9.1	0.0	7.5	0.0

mixed culture 1/2

Table.5 Properties of the monoculture isolated from market yoghurt(1) (1/8)

Medium: 10% milk powder medium with 0.1% B.Y.E
Incubation condition: 37°C

Yoghurt	Isolated Strain No.	Inoculation Time	Form	Acidity		Kinematic Viscosity (cst)	Viscosity	Number 16hr (10 ⁶ cfu/ml)
				16hr (%)	40hr (%)			
Danone	1-1	9	Spheres	1.07	1.15	1.067	—	
	1-2	9	Spheres	1.06	1.17	1.057	—	
	1-3	9	Spheres	1.05	1.15	1.069	—	
	1-4	9	Spheres	1.05	1.16	1.055	—	
	1-5	9	Spheres	1.04	1.17	1.057	—	
	D1	10	Rods	1.09	1.46	1.105	—	
	D2	10	Rods	1.06	1.43	1.134	—	
	D4	10	Rods	1.01	1.40	1.103	—	
	D5	10	Rods	1.03	1.45	1.128	—	
	D6	10	Rods	1.05	1.55	1.105	—	
	D7	10	Rods	1.08	1.61	1.122	—	
	D8	10	Rods	1.05	1.62	1.111	—	
	D9	10	Rods	1.05	1.61	1.128	—	
	D10	10	Rods	1.04	1.54	1.117	—	
	D12	10	Rods	1.04	1.54	1.116	—	
	D1	22	Rods	0.87	1.21	1.105	—	105.0
	D2	21	Rods	0.77	1.26	1.099	—	81.5
	D4	18	Rods	0.87	1.13	1.114	—	29.5
	D5	23	Rods	0.86	1.23	1.140	—	45.5
	D6	22	Rods	0.83	1.31	1.094	—	103.0
	D7	20	Rods	0.96	1.30	1.105	—	53.0
	D8	22	Rods	1.00	1.28	1.085	—	17.0
	D9	22	Rods	0.91	1.22	1.105	—	12.5
	D10	21	Rods	0.76	1.26	1.088	—	33.5
	D12	20	Rods	0.92	1.16	1.099	—	35.0
	D13	10	Rods	0.69	1.18	1.093	—	
	D14	10	Rods	0.80	1.24	1.093	—	
	D15	10	Rods	0.90	1.27	1.087	—	
	D16	10	Rods	0.87	1.30	1.133	—	
	D18	10	Rods	0.88	1.29	1.102	—	
D19	10	Rods	0.77	1.17	1.093	—		
D13	20	Rods	0.66	1.05	0.976	—	94.0	
D14	20	Rods	0.70	1.17	0.902	—	85.0	
D15	20	Rods	0.72	1.01	0.963	—	66.0	
D16	20	Rods	0.65	1.03	1.128	—	42.0	
D18	20	Rods	0.68	1.05	1.095	—	41.0	
D19	20	Rods	0.68	1.08	0.990	—	45.0	

Table.5 Properties of the monoculture isolated from market yoghurt(2)

(2/8)

Medium: 10% milk powder medium with 0.1% B.Y.E
 Incubation condition: 37°C

Yoghurt	Isolated Strain No.	Inoculation Time	Form	Acidity		Kinematic Viscosity (cst)	Viscosity	Number 16hr (10 ⁶ cfu/ml)
				16hr (%)	40hr (%)			
Verea	2-1	9	Spheres	1.10	1.12	1.105	—	
	2-2	9	Spheres	1.04	1.07	1.096	—	
	2-3	9	Rods	1.19	1.46	1.053	—	
	2-4	9	S+R	1.13	1.16	1.064	—	
Plovdiv	3-1	9	Spheres	1.04	1.04	1.053	—	
	3-2	9	Spheres	1.04	1.05	1.058	—	
	3-3	9	Rods	1.04	1.32	1.111	—	
	3-4	9	Rods	1.01	1.39	1.108	—	
	3-5	9	Rods	1.01	1.33	1.088	—	
Montana	4-1	9	Spheres	0.98	0.96	1.050	—	
	4-3	9	Rods	0.98	1.31	1.087	—	
	4-4	9	Rods	1.04	1.42	1.082	—	
	4-5	9	Rods	1.02	1.37	1.084	—	
Pleven	5-1	9	Spheres	1.09	1.09	1.076	—	
	5-2	9	Spheres	1.03	1.05	1.094	—	
	5-3	9	Rods	1.32	1.81	1.100	—	
	5-4	9	Rods	0.94	1.46	1.113	—	
	5-5	9	Rods	0.95	1.45	1.094	—	
Nestle	N-1	10	Spheres	1.05	1.19	1.183	+	
	N-2	10	Spheres	1.23	1.40	1.093	—	o
	N-3	10	Spheres	1.08	1.27	1.189	+	
	N-4	10	Spheres	1.07	1.25	1.173	+	
	N-5	10	Spheres	1.09	1.29	1.192	+	o
	N-6	10	Spheres	1.09	1.29	1.199	+	
	N-7	10	Spheres	1.23	1.31	1.256	+	
	N-8	10	Spheres	1.23	1.32	1.261	++	o
	N-9	10	Spheres	1.25	1.33	1.315	++	
	N-10	10	Spheres	1.24	1.38	1.340	++	o
	N-11	10	Spheres	1.05	1.27	1.198	+	

Table.6 Research on the combination of isolated strains
Fermentative activity test

(3/8)

Strains: Lactobacillus isolated from market yoghurt , L.bulgaricus No.2038 , S.thermophilus No.1131

Medium: 10% skim milk powder medium

Pasteurization condition: 90°C, 5min

Inoculation volume and ratio: 2%, No.1131:L=1:1 (Direct inoculation of mother starter)

Incubation condition: 43°C, 3hrs in water bath

Trial	Combination		Ratio S:L	Mother starter Acidity (%)		Activity After 3hr Acidity (%)	Viscosit of product	Preservation test at 10°C Changing of the acidity			
	S	L		S	L			Initial: A	7days: B	21days	B-A
(1)	1131	2-3	1:1	0.95	1.29	0.68	+	0.80	1.06	1.18	0.26
	1131	3-3		0.95	1.31	0.77	+	0.85	1.13	1.23	0.28
	1131	3-4		0.95	1.38	0.75	+	0.86	1.14	1.25	0.28
	1131	4-3		0.95	1.20	0.75	+	0.85	1.12	1.22	0.27
	1131	4-4		0.95	1.20	0.71	+	0.80	1.09	1.21	0.29
	1131	2038		0.95	1.45	0.76	+	0.85	1.11	1.20	0.26
(2)	1131	3-5	1:1	0.95	1.01	0.82	+	0.86	1.10	1.19	0.24
	1131	4-5		0.95	1.11	0.82	+	0.88	1.10	1.23	0.22
	1131	5-3		0.95	1.37	0.85	+	0.93	1.10	1.24	0.17
	1131	5-4		0.95	1.08	0.84	+	0.87	1.10	1.23	0.23
	1131	5-5		0.95	1.05	0.81	+	0.82	1.09	1.19	0.27
	1131	2038		0.95	1.28	0.77	+	0.80	1.07	1.20	0.27
(3)	2-1	2038	1:1	1.17	1.44	0.72	-	0.86	1.04	1.11	0.18
	2-2	2038		1.13	1.44	0.71	-	0.86	1.06	1.12	0.20
	3-1	2038		1.06	1.44	0.78	-	0.85	1.03	1.10	0.18
	3-2	2038		1.08	1.44	0.79	-	0.85	1.06	1.09	0.21
	4-1	2038		1.10	1.44	0.77	-	0.82	1.01	1.06	0.19
	1131	2038		0.99	1.44	0.74	+	0.86	1.09	1.14	0.23
(4)	1-1	2038	1:1	1.09	1.29	*0.48	-	0.83	1.04	1.13	0.21
	1-2	2038		1.12	1.29	*0.47	-	0.83	1.03	1.16	0.20
	1-3	2038		1.14	1.29	*0.44	-	0.82	1.04	1.15	0.22
	5-1	2038		1.08	1.29	0.72	-	0.83	1.03	—	0.20
	5-2	2038		0.98	1.29	0.74	-	0.82	1.02	—	0.20
	1131	2038		1.01	1.29	0.72	+	0.81	1.07	1.19	0.26
(5)	1131	D1	1:1	1.04	1.11	*0.45	+	0.74	0.86	—	0.12
	1131	D2		1.04	0.91	*0.45	+	0.75	0.79	—	0.04
	1131	D5		1.04	1.04	*0.44	+	0.74	0.85	—	0.11
	1131	D6		1.04	1.13	*0.48	+	0.77	0.85	—	0.08
	1131	D7		1.04	0.97	*0.45	+	0.74	0.83	—	0.09
	1131	2038		1.04	1.63	0.80	+	0.83	1.10	—	0.27

*1 After 4hr 20min Acidity: 0.77%

*2 After 5hr 30min Acidity: 0.73%

Table.7 Viability of *L.bulgaricus* in the cold storage

1. Preparation condition for the culture
 Medium : 10% skim milk powder + 0.1% B.Y.E
 Incubation condition : 1% inoculation, 37°C, 16hrs

2. Preservation condition : 5°C for 3weeks

Changing of the number of *L.bulgaricus* during cold storage (BCP)

L.bulgaricus No.	Initial A $\times 10^6$ cfu/ml	2weeks B		3weeks C		Survival rate	
		$\times 10^6$ cfu/ml	$\times 10^6$ cfu/ml	$\times 10^6$ cfu/ml	$\times 10^6$ cfu/ml	B/A (%)	C/A (%)
2-3	25.0	2.0	11.5	1.0	5.5	8.0	4.0
3-3	2.5	5.0	49.5	2.0	13.5	200.0	80.0
3-5	25.0	15.5	144.0	10.5	94.0	62.0	42.0
4-3	25.0	33.5	321.0	22.0	178.0	134.0	88.0
4-5	25.0	11.5	84.0	13.5	135.0	46.0	54.0
5-3	4.5	3.5	20.0	0.5	2.5	77.8	11.1
B5	25.0	5.0	80.0	1.0	30.0	20.0	4.0
B26	95.0	48.5	414.0	10.0	68.0	51.1	10.5
B87	95.0	28.0	235.5	9.0	150.5	29.5	9.5
B41	95.0	25.0	—	—	—	26.3	—
2038	95.0	12.0	115.0	4.0	14.0	12.6	4.2

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24.04.1998г.

Ирменевский ЦЛ

Г-н Фрунзе

ПОСТКИСЕЛИНООБРАЗОВАНИЕ НА ЛАКТОБАЦИЛУС БУЛГАРИКУС

Проби	МЛЯКО	0 часа				16 часа (37°C)				2 седмици (5°C) 8.5.98г.				3 седмици (5°C) 15.5.98г.			
		pH	TK, T	бр. клетки	pH	TK, T	бр. клетки	pH	TK, T	бр. клетки	pH	TK, T	бр. клетки	pH	TK, T	бр. клетки	
B 2038	SMP 10% BYE 0.1%	6.19	22	2.5x10 ⁶	3.75	150	9.5x10 ⁶	3.73	155	2.5x10 ⁶	3.73	154	4.5x10 ⁷	} Вспр			
				8.4x10 ⁶		(1.35)	1.0x10 ⁷				115x10 ⁶				14x10 ⁶		
B 5		6.23	21	2.5x10 ⁶	3.90	130	2.5x10 ⁶	3.89	150	8.5x10 ⁷	3.88	158	4.5x10 ⁷	} Вспр			
				7.7x10 ⁶		(1.17)	2.0x10 ⁶								30x10 ⁶		
B 26		6.30	20	2.5x10 ⁶	3.61	172	9.5x10 ⁶	3.60	183	2.5x10 ⁶	3.64	187	4.5x10 ⁷	} Вспр			
				6.9x10 ⁶		(1.57)	3.4x10 ⁶								68x10 ⁶		
B 37		6.22	21	2.5x10 ⁶	3.79	144	9.5x10 ⁶	3.79	162	2.5x10 ⁶	3.83	164	2.5x10 ⁶	} Вспр			
				5.8x10 ⁶		(1.30)	1.6x10 ⁶								150.5x10 ⁶		
B 41		6.23	19	2.5x10 ⁶	3.79	144	9.5x10 ⁶	3.80	152	2.5x10 ⁶	3.84	166	4.5x10 ⁷	} Вспр			
				3.0x10 ⁵		(1.30)	1.0x10 ⁷								0		

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Viability of *L. bulgaricus* in yoghurt under the cold storage on 1.1.01

- Preparation for mother starter
 Medium: 10% skim milk powder + 0.1% BYE
 Incubation condition: 1% inoculation, 37°C, 16 hrs
- Preparation for yoghurt
 Medium: 10% skim milk powder
 Pasteurization: 90 - 93°C, 5 min
 Fermentation condition: Mother starter 2% inoculation / mixed culture method /
S. thermophilus No 1131 : *L. bulgaricus* = 1 : 1
 Fermentation temperature 43°C / water bath
 Final acidity 0.75-0.78 %

3. Preservation condition: 4 - 5°C for 5 weeks
 Changing of the number of *L. bulgaricus* during cold storage (B. 2.2)

L.b. No	mother			Fermentation process		Storage period	Acidity %	pH	Qualitative properties during cold storage at 4 - 5 °C				
	starter Acidity %	After 3 hrs Acidity %	Final acidity pre-storage %	Final acidity %	<i>L. bulgaricus</i> 10 ⁶ cfu/ml				<i>L. bulgaricus</i> 10 ⁶ cfu/ml	No 1131 10 ⁶ cfu/ml			
b2038	1.43	0.77	0.77/3 hr	0.77	10 ⁶ cfu/ml	3 d	2.16	4.27	10 ⁶ cfu/ml	10 ⁶ cfu/ml	No 1131 10 ⁶ cfu/ml		
				1.03	139x10 ⁶	1 w	1.03	4.15	22.5x10 ⁶	>300x10 ⁶	>300x10 ⁶	83x10 ⁷	
						2 w							
						3 w							
						4 w							
B5	1.12	0.71	0.80/3.30 hr	0.71	22x10 ⁶	3 d	3.93	4.32	9x10 ⁶	22x10 ⁶	>300x10 ⁶		
				1.01	2.5x10 ⁶	1 w	1.01	4.15	1x10 ⁶	>300x10 ⁶	90x10 ⁷		
						2 w							
						3 w							
						4 w							
		5 w											

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b26	1.56	0.76	0.7673 hr	3 d	0.94	4.30	327.5x10 ⁶	34x10 ⁷	85.5x10 ⁷
				1 w	1.00	4.19	169x10 ⁶	29.5x10 ⁷	>300x10 ⁷
				2 w					68.5x10 ⁷
				3 w					
				5 w					
b37	1.40	0.72	0.7973.30 hr	3 d	0.93	4.31	51.5x10 ⁶	8.5x10 ⁷	>300x10 ⁷
				1 w	1.00	4.17	44.5x10 ⁶	4.5x10 ⁷	>300x10 ⁷
				2 w					88x10 ⁷
				3 w					
				5 w					
b41	1.50	0.72	0.7873.30 hr	3 d	0.88	4.34	5x10 ⁶	0x10 ⁷	>300x10 ⁷
				1 w	0.84	4.24	0x10 ⁶	0x10 ⁷	>300x10 ⁷
				2 w					198x10 ⁷
				3 w					
				5 w					

(8/8)

Table.8 Viability of *L.bulgaricus* in yoghurt under the cold storage condition

1. Preparation for mother starter
 Medium : 10% skim milk powder + 0.1% B.Y.E
 Incubation condition : 1% inoculation, 37°C, 16hrs
2. Preparation for yoghurt
 Medium : 10% skim milk powder
 Pasteurization : 90~93°C, 5min
 Fermentation condition : Mother starter 2% inoculation (mixed culture method)
 S.thermophilus No.1131: *L.bulgaricus* = 1 : 1
 Fermentation temperature 43°C (water bath)
 Final acidity 0.75~0.78%
3. Preservation condition : 4~5°C for 5weeks

Changing of the number of *L.bulgaricus* during cold storage (BCP)

L.b No.	mother starter pH	Fermentation process		Qualitative properties during cold storage at 4~5°C					
		After 3hrs Acidity (%)	Final acidity pre-storage (%)	Storage period	Acidity (%)	pH	Number of lactic acid bacteria		
							<i>L.bulgaricus</i>		No.1131
10 ⁶ cfu/ml	10 ⁶ cfu/ml	10 ⁶ cfu/ml							
2-3	3.74	0.56	0.75	1day	0.83	4.41	7.0	—	30.0
				1w	0.85	4.26	0.0	1.0	47.0
				2w					
				3w					
				4w					
3-3	3.69	0.70	0.75	1day	0.90	4.27	24.0	—	29.0
				1w	0.98	4.08	45.5	328.0	47.0
				2w					
				3w					
				4w					
3-5	3.69	0.69	0.75	1day	0.86	4.37	15.0	—	43.0
				1w	0.94	4.19	10.0	118.0	60.5
				2w					
				3w					
				4w					
4-3	3.71	0.71	0.76	1day	0.86	4.36	19.0	—	18.0
				1w	0.94	4.18	21.0	172.0	18.0
				2w					
				3w					
				4w					
4-5	3.82	0.72	0.76	1day	0.87	4.34	34.0	—	11.0
				1w	0.97	4.15	25.5	264.0	12.5
				2w					
				3w					
				4w					
5-3	3.52	0.72	0.77	1day	0.92	4.26	23.0	—	32.0
				1w	0.97	4.14	26.0	193.0	41.0
				2w					
				3w					
				4w					

Penicillin

Λ = 3/1 = 30% (1)

ИЗСЛЕДВАНЕ НА СИМБИОТИЧНИ ЗАКВАСКИ ЗА АНТИБИОТИЧЕН ТОЛЕРАНС

Λ = 3/4 = 0.75, 0.01, 0.02 IU

МЕРСК

Използува се 10% обезмаслено кравче мляко

Пасторизира се на 95 °C за 5 минути

Инокуира се на 45 °C с 2% закваска симбиотична и с 1%:1% смесена 1131-2038 като контрола

Време показатели	МЛЯКО		СМЕСЕНА ЗАКВАСКА 1131-2038 <i>Mix starter</i>		СИМБИОТИЧНА СМЕС 26-12 <i>Symbiotic starter</i>	
	СР МЕРСК 10%	без пеницилин	с 0.01 IU пеницилин	с 0.02 IU пеницилин	без пеницилин	с 0.01 IU пеницилин
0 h (11:20 h)						
pH	6.58	6.45	6.45	6.45	6.48	6.48
ТК, °T	16	18	18	18	17	17
брой клетки		St > 300 x 10 ⁴ 257.5 x 10 ⁵ Lb 17.5 x 10 ⁴ 6 x 10 ⁵			St > 300 x 10 ⁴ 308 x 10 ⁵ Lb 36.5 x 10 ⁴ 1.5 x 10 ⁵	
2 h (13:20 h)						
pH		5.40	5.48	5.63	5.37	5.40
% <i>Lactic acid</i>		0.49	0.43	0.41	0.48	0.46
м.киселина 25x(13:50h)						
pH		5.07	5.21	5.39	5.05	5.18
% <i>Lactic acid</i>		0.59	0.56	0.49	0.60	0.58
м.киселина 3 h (14:20 h)						
pH		4.85	4.97	5.11	4.82	4.88
% <i>Lactic acid</i>		0.71	0.64	0.61	0.71	0.68
м.киселина брой клетки 3.5h (14:50h)		St 43 x 10 ⁷ Lb 1.0 x 10 ⁷	St 26.5 x 10 ⁷ Lb 0.5 x 10 ⁷	St 10.3 x 10 ⁷ Lb 0.1 x 10 ⁷	St 99 x 10 ⁷ Lb 4.5 x 10 ⁷	St 36.5 x 10 ⁷ Lb 2.7 x 10 ⁷
						St 14.5 x 10 ⁷ Lb 1.7 x 10 ⁷

Symbiotic Culture
特性調査 (1/7)

pH	4.65	4.79	4.95	4.59	4.67	4.87
% <i>Lactococcus acid</i>	0.83	0.74	0.70	0.84	0.78	0.63
МА. КИСЕЛИНА	SI > 300 x 10 ⁶			SI > 300 x 10 ⁶		
БРОЙ	48.5 x 10 ⁷			103.5 x 10 ⁷		
КЛЕТКИ	Lb 24 x 10 ⁶			Lb 59.5 x 10 ⁶		
	2 x 10 ⁷			9.5 x 10 ⁷		
4h (15.20h)						
pH		4.67	4.82		4.53	4.71
% <i>Lactococcus acid</i>		0.81	0.74		0.82	0.76
МА. КИСЕЛИНА						
БРОЙ		SI 240 x 10 ⁶			SI > 300 x 10 ⁶	
КЛЕТКИ		31 x 10 ⁷			58 x 10 ⁷	
		Lb 4 x 10 ⁶			Lb 40.5 x 10 ⁶	
		0.5 x 10 ⁷			1.5 x 10 ⁷	
4.5h (15.50h)						
pH			4.78			4.63
% <i>Lactococcus acid</i>			0.77			0.82
МА. КИСЕЛИНА						
БРОЙ			SI 141 x 10 ⁶			SI 133 x 10 ⁶
КЛЕТКИ			19 x 10 ⁷			13.5 x 10 ⁷
			Lb 22 x 10 ⁶			Lb 38 x 10 ⁶
			2 x 10 ⁷			2.5 x 10 ⁷

(2/7)

ji ca_penicilin .doc

ИЗСЛЕДВАНИЯ ВЪРХУ ВЪЗДЕЙСТВИЕТО НА ПЕНИЦИЛИНА ВЪРХУ ЙОГУРТОВИТЕ БАКТЕРИИ
2 СПИТ
20.05.1998 ГОДИНА

Използвано мляко 10% SMP MERCK
Пастеризация на 90-95 °C за 5 минути
Инокулация на 45 °C с 2% симбиотична закваска 26-12

Закваска 26-12	Концентрации на ПЕНИЦИЛИНА (IU/ml мляко)			
	0 IU/ml мляко	0.22 IU/ml мляко	0.03 IU/ml мляко	0.04 IU/ml мляко
0 h - pH	6.84	6.84	6.84	6.84
% МЛА К-НА	18 °T	18 °T	18 °T	18 °T
брой клетки				
2 h - pH	4.90	4.90	5.06	5.12
% МЛА К-НА	0.60	0.59	0.52	0.48
брой клетки				
2.5 h - pH	4.64	4.70	4.86	4.95
% МЛА К-НА	0.74	0.70	0.63	0.60
брой клетки	St 566 x 10 ⁶ Lb 70.5 x 10 ⁷ Lb 42 x 10 ⁶ 8.5 x 10 ⁷			
3 h - pH	4.38	4.50	4.69	4.80
% МЛА К-НА	0.84	0.78	0.71	0.65
брой клетки	St >300 x 10 ⁶ 60.5 x 10 ⁷ Lb 61.5 x 10 ⁶ 5 x 10 ⁷	St 265 x 10 ⁶ 21.5 x 10 ⁷ Lb 18.5 x 10 ⁶ 3 x 10 ⁷	St 101 x 10 ⁶ 15.5 x 10 ⁷ Lb 10 x 10 ⁶ 2.5 x 10 ⁷	St 47.5 x 10 ⁶ 2 x 10 ⁷ Lb 20.5 x 10 ⁶
				St 4.5 x 10 ⁶ 1.5 x 10 ⁷ Lb 4.5 x 10 ⁶

(4/9)

3.5 h - pH	4.52	4.65	4.80
% мл. к-на	0.80	0.73	0.65
брой клетки	St 99 x 10 ⁶ Lb 24 x 10 ⁶ 4.5 x 10 ⁷		
4 h - pH	4.51		4.68
% мл. к-на	0.80		0.70
брой клетки	St 24.5 x 10 ⁶ 7 x 10 ⁷ Lb 5.5 x 10 ⁶ 2 x 10 ⁷		
4.5 h - pH			4.57
% мл. к-на			0.78
брой клетки			St 5 x 10 ⁶ Lb 0 x 10 ⁶

Фрагм
98.5.28

ИЗСЛЕДВАНИЯ ВЪРХУ ВЪЗДЕЙСТВИЕТО НА ПЕНИЦИЛИНА ВЪРХУ СИМБИОТИЧНИ ЗАКВАСКИ ЗА
БЪЛГАРСКО КИСЕЛО МЛЯКО
3 ОПИТ (28.06.1998)

Използвано мляко 10% SMP MERCK
Пастеризация на 90-95 °C за 5 минути
Инокулация на 45 °C със симбиотични закваски

	5-12	25-12	37-12	144-12
pH	0.18	0.04	0.10	0.10
закваски	4.58	4.81	4.60	4.59
% МЛ.К.МЗ	0.84	0.77	0.70	0.72
закваски	St > 300x10 ⁶	St > 300x10 ⁶	St > 300x10 ⁶	St > 300x10 ⁶
Брой клетки	49 x 10 ⁷	68 x 10 ⁷	57 x 10 ⁷	78 x 10 ⁷
закваски	Lb 7 x 10 ⁶	Lb 5 x 10 ⁶	Lb 35.5 x 10 ⁶	Lb 27 x 10 ⁶
	5 x 10 ⁷		4 x 10 ⁷	1 x 10 ⁷
2.5h - pH	4.87	5.26	4.81	4.82
% МЛ.К.МЗ	0.68	0.49	0.71	0.70
Брой клетки				
3h - pH	4.57	5.17	4.58	4.57
% МЛ.К.МЗ	0.79	0.51	0.81	0.79
Брой клетки	St > 300x10 ⁶	St > 300x10 ⁶	St > 300x10 ⁶	St > 300x10 ⁶
	75 x 10 ⁷	45 x 10 ⁷	88.5 x 10 ⁷	104.5 x 10 ⁷
	Lb 96.5 x 10 ⁶	Lb 4.5 x 10 ⁶	Lb 84.5 x 10 ⁶	Lb 85.5 x 10 ⁶
	7 x 10 ⁷		11 x 10 ⁷	9.5 x 10 ⁷
2.5h - pH	5.14	5.27	5.03	5.15
% МЛ.К.МЗ	0.52	0.50	0.47	0.53
Брой клетки				

(6/9)

4h - pH	5.14	5.00	5.22	5.10	6.15
% M.A.K.-HB	0.52	0.58	0.52	0.53	0.26
БРОЯ КЛЕТКИ					
45h - pH	5.14	4.84	5.17	5.10	6.13
% M.A.K.-HB	0.52	0.69	0.53	0.53	0.26
БРОЯ КЛЕТКИ	SI 64 x 10 ⁴ 25.5 x 10 ⁷ Lb 5 x 10 ⁶ 1 x 10 ⁷	SI > 300 x 10 ⁶ 79.5 x 10 ⁷ Lb 91 x 10 ⁶ 10 x 10 ⁷	SI 32.5 x 10 ⁶ 20 x 10 ⁷ Lb 0 x 10 ⁶ 0.5 x 10 ⁷	SI 70.5 x 10 ⁶ 4.5 x 10 ⁷ Lb 7 x 10 ⁶ 0.5 x 10 ⁷	SI 46 x 10 ⁶ 22 x 10 ⁷ Lb 2 x 10 ⁶

(7/9)

ОПИТИ ЗА ПОСТКИСЕЛИНООБРАЗУВАНЕ

12.03.1998 г.

Използваме сухо обезмаслено мляко (Видин) 10%

Пастъоризираме до 92-95°C за 5 минути

Охлаждане до 45°C

Инокулиране с 2% закваска и разливане в епруветки по 15 ml

Ферментация до 85°C (начало 12.05 h)

Бързо охлаждане с вода и лед

Съхранение 2 седмици на 10°C

Време	закваска 1 5-12	закваска 2 37-12	закваска 3 41-14	закваска 4 144-12
13.30 h (1.25 h)	36°C	35°C	33°C	31°C
14.00 h (1.55 h)	62°C	56°C	60°C	48°C
14.30 h (2.25 h)	72°C	70°C	65°C	60°C
15.00 h (2.55 h)	85°C	82°C	80°C	
15.10 h (3.05 h)		86°C		
15.15 h (3.10 h)			84°C	
15.25 h (3.20 h)				85°C
13.03.98 (24 h)	100°C	94°C	93°C	91°C
7 ден (19.03.)	104°C	102°C	101°C	100°C
14 ден (26.03.)	114°C	109°C	107°C	111°C

RDP center

アーンヨーグルトの
嗜好性調査
(1/16)

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА
КИСЕЛО МЛЯКО

Име:

1. R - S
2. S - R

I. След като дегустирахте проби R и S, коя от двете бихте купили?
Отбележете с кръгче, коя от тях е по-добра според Вас, обяснете
причините за това.

5 определено предпочи- там R	4 предпочи- там R	3 двете проби са еднакви	2 предпочи- там S	1 определено предпочи- там S
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Обяснете избора си:

(2/15)

2

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА КИСЕЛО МЛЯКО

II. Определете коя от двете проби е по-подходяща за Вас?
Попълнете въпросника. Какво мислите за:

1. Аромата

5	4	3	2	1
Р е с по-добър аромат	Р е с малко по-добър аромат	не мога да определя	С е с малко по-добър аромат	С е с по-добър аромат

2. Консистенцията (гладкостта)

5	4	3	2	1
Р е с по-добра консистенция	Р е с малко по-добра консистенция	не мога да определя	С е с малко по-добра консистенция	С е с по-добра консистенция

3. Степента на киселинност

5	4	3	2	1
Р е по-кисел	Р е малко по-кисел	не мога да определя	С е малко по-кисел	С е по-кисел

4. Предпочитание за кисел вкус

5	4	3	2	1
Р е по-кисел	Р е малко по-кисел	не мога да определя	С е малко по-кисел	С е по-кисел

5. Усещане за сладост

5	4	3	2	1
Р е по-сладък	Р е малко по-сладък	не мога да определя	С е малко по-сладък	С е по-сладък

6. Предпочитание за сладък вкус

5	4	3	2	1
Р е по-сладък	Р е малко по-сладък	не мога да определя	С е малко по-сладък	С е по-сладък

7. Отношение (баланс) между кисел и сладък вкус

5	4	3	2	1
Р е по-сладък	Р е малко по-сладък	не мога да определя	С е малко по-сладък	С е по-сладък

8. Мекота и нежност на вкуса

5	4	3	2	1
Р е по-сладък	Р е малко по-сладък	не мога да определя	С е малко по-сладък	С е по-сладък

9. Плътност на продукта

5	4	3	2	1
Р е по-плътен	Р е малко по-плътен	не мога да определя	С е малко по-плътен	С е по-плътен

10. Усещане след дегустация

5	4	3	2	1
Р е по-плътен	Р е малко по-плътен	не мога да определя	С е малко по-плътен	С е по-плътен

(3/10)

3

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА
КИСЕЛО МЛЯКО

III. След попълването на дегустационната карта (страници 1 и 2), коя от двете проби бихте предпочели да закупите?
Отбележете с кръгче, коя от тях е по-подходяща за Вас.

5 определено предпочи- там R	4 предпочи- там R	3 двете проби са еднакви	2 предпочи- там S	1 определено предпочи- там S
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IV. Какъв обем (ml) на пробата за дегустация считате, че е по-подходящ?

По-подходяща е пробата от 100ml	По-подходяща е пробата от 180ml
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(4/16)

Consumer test of plain yoghurt in LB center

Panel	SECTION	ORDER	Q1	Q2-1	Q2-2	Q2-3	Q2-4	Q2-5	Q2-6	Q2-7	Q2-8	Q2-9	Q2-1	Q3	Q4
1	P	2	4	5	1	4	4	2	4	4	4	2	2	4	1
2	P	2	4	4	1	4	3	1	3	1	1	1	1	4	1
3	P	2	2	2	2	4	2	2	2	2	2	2	1	2	2
4	P	1	5	5	1	4	4	2	3	1	1	5	5	4	1
5	P	1	1	3	2	4	4	2	2	2	1	2	1	2	1
6	T	1	4	5	1	4	4	4	4	4	2	1	1	4	2
7	T	1	5	5	5	5	5	5	5	5	5	5	5	5	1
8	T	1	2	5	2	4	4	4	2	4	4	2	2	2	1
9	T	2	4	4	3	5	5	3	3	3	3	4	4	4	1
10	T	2	2	2	1	2	2	1	2	2	2	1	1	2	2
11	A	1	1	1	1	4	2	3	3	2	2	1	1	1	2
12	A	1	2	5	1	5	5	1	1	2	2	1	3	5	2
13	A	2	1	1	1	3	3	2	2	2	2	2	2	5	1
14	A	2	1	2	1	2	2	2	2	3	1	1	1	1	1
15	A	2	5	1	4	4	4	3	2	4	4	5	5	4	1
16	R	1	2	5	1	2	4	1	1	4	4	4	1	2	1
17	R	1	4	5	1	5	4	1	3	4	1	2	2	4	2
18	R	1	3	5	3	5	4	4	2	3	3	2	3	3	2
19	R	2	4	3	1	4	4	2	2	2	2	2	2	4	2
20	R	2	4	4	2	4	4	2	1	1	5	4	4	4	2
AVERAGE			3.0	3.6	1.8	3.9	3.7	2.4	2.5	2.8	2.6	2.5	2.4	3.3	1.5

Consumer test of plain yoghurt in LB center

12 March 1998

Judgment

	N	TOTAL POSITIVE										R+S
		5	4	3	2	1	R	S	R+S			
Q1	20	3	7	1	5	4	52.6	47.4	10	9	19	
Q2-1	20	9	3	2	3	3	66.7	33.3	12	6	18	
Q2-2	20	1	1	2	4	12	11.1	88.9	2	16	18	
Q2-3	20	5	11	1	3	0	84.2	15.8	16	3	19	
Q2-4	20	3	11	2	4	0	77.8	22.2	14	4	18	
Q2-5	20	1	3	3	8	5	23.5	76.5	4	13	17	
Q2-6	20	1	2	5	9	3	20.0	80.0	3	12	15	
Q2-7	20	1	6	3	7	3	41.2	58.8	7	10	17	
Q2-8	20	2	4	2	7	5	33.3	66.7	6	12	18	
Q2-9	20	3	3	0	8	6	30.0	70.0	6	14	20	
Q2-10	20	3	2	2	5	8	27.8	72.2	5	13	18	
Q3	20	3	9	1	5	2	63.2	36.8	12	7	19	

significant difference in 5%

significant difference in 5%

significant difference in 5%

significant difference in 5%

Sample R : symbiotic culture 26-12
Sample S : mixed culture No.1131 + No.2038

- (1) Preparation date of the samples : 11 March 1998
- (2) Milk solid of the samples: FAT 3.25%, SNF 8.11%
- (3) Qualitative properties of the samples (12 March, after 1 day)
<Acidity> R : 0.77%, S : 0.80%

(5/16)

(5/15)

**TOTAL PREFERENCE
GROUP 1 (R - S) AND GROUP 2 (S - R)
FROM "ELBY BULGARICUM CRDP"**

- I. Preference for R - 10 person
- II. Preference for S - 9 person
- III. Not preference for R and S - 1 person

I. Preference for R - 10 person	
Preference for R	Negative Reason for S
1. Traditional Bulgarian Yoghurt - 5 2. Lactic Acid Taste - 4 3. Better Flavour - 2 4. Better Density (Structure) - 2	1. Without Taste and Flavour - 1
Negative Reason for R	Preference for S
1. Small Acidity - 1 2. Have not Typical Structure - 1 3. Low Flavour - 1	1. Good Structure - 1 2. Mild Structure - 1
II. Preference for S - 9 person	
Preference for S	Negative Reason for R
1. Mild Structure - 3 2. Density Structure - 7 3. Small Amount of Whey Separation - 1 4. Specific Taste - 3	
Preference for R	Negative Reason for S
1. Lactic Acid Taste - 3 2. High Acidity - 1 3. Low Flavour - 1	
III. Not preference for R or S - 1 Person	
Preference for S	Negative Reason for R
1. Better Structure - 1	
Preference for R	Negative Reason for S
1. Better Flavour - 1 2. High Acidity - 1	1. Different than Bulgarian Yoghurt - 1

(7/16)

Science academy

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА
КИСЕЛО МЛЯКО

Групи за дегустация?

1.	R - S
2.	S - R

Възраст

1.	2.	3.	4.	5.
20 - 30	30 - 40	40 - 50	50 - 60	над 60

Пол

мъжки
женски

I. След като дегустирахте проби R и S, коя от двете бихте купили?
Отбележете с кръгче, коя от тях е по-добра според Вас, обяснете
причините за това.

5 определено предпочи- там R	4 предпочи- там R	3 не мога да определя коя е по- добра	2 предпочи- там S	1 определено предпочи- там S
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Обяснете избора си:

(8/16)

2

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА КИСЕЛО МЛЯКО

II. Определете коя от двете проби е по-подходяща за Вас?
Попълнете въпросника. Какво мислите за:

1. Предпочитание за аромат

5	4	3	2	1
Р е с по-добър аромат	Р е с добър аромат	и двете проби са еднакви	С е с добър аромат	С е с по-добър аромат

2. Предпочитание за гладкост на консистенцията

5	4	3	2	1
Р е с по-добра консистенция	Р е с добра консистенция	не мога да определя	С е с добра консистенция	С е с по-добра консистенция

3. Усещане за киселинност

5	4	3	2	1
Р е с по-изразена киселинност	Р е с по-малко изразена киселинност	не мога да определя	С е с по-малко изразена киселинност	С е с по-изразена киселинност

4. Предпочитание за кисел вкус

5	4	3	2	1
Р е с по-предпочитан кисел вкус	Р е с по-малко изразен кисел вкус	не мога да определя	С е с по-малко изразен кисел вкус	С е с по-предпочитан кисел вкус

5. Усещане за сладост

5	4	3	2	1
Р е с изразен сладък вкус	Р е по-малко сладък вкус	не мога да определя	С е по-малко сладък вкус	С е с изразен сладък вкус

6. Предпочитание за сладък вкус

5	4	3	2	1
Р е с по-предпочитан сладък вкус	Р е по-малко предпочитан сладък вкус	не мога да определя	С е с по-малко предпочитан сладък вкус	С е с по-предпочитан сладък вкус

7. Предпочитание за баланс между кисел и сладък вкус

5	4	3	2	1
Р е с по-изразен млечнокисел вкус	Р е с изразен млечнокисел вкус	не мога да определя	С е с изразен млечнокисел вкус	С е с по-изразен млечнокисел вкус

8. Предпочитание за мекота и нежност на вкуса

5	4	3	2	1
Р е с по-нежен, мек, млечнокисел вкус	Р е по-малко нежен, мек млечнокисел вкус	не мога да определя	С е по-малко нежен, мек млечнокисел вкус	С е с по-нежен, мек, млечнокисел вкус

9. Предпочитание за плътеност на продукта

5	4	3	2	1
Р е по-плътен	Р е малко по-плътен	не мога да определя	С е малко по-плътен	С е по-плътен

10. Усещане след дегустация

5	4	3	2	1
Р е с по-приятен млечнокисел вкус	Р е с приятен млечнокисел вкус	не мога да определя	С е с приятен млечнокисел вкус	С е с по-приятен млечнокисел вкус

(9/15)

3

ДЕГУСТАЦИОННА КАРТА ЗА ОЦЕНКА НА
КИСЕЛО МЛЯКО

III. След попълването на дегустационната карта (страници 1 и 2), коя от двете проби бихте предпочели да закупите?
Отбележете с кръгче, коя от тях е по-подходяща за Вас.

5 определено предпочи- там R	4 предпочи- там R	3 двете проби са еднакви	2 предпочи- там S	1 определено предпочи- там S
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(10/16)

Consumer test of plain yoghurt in science academy

Panel	SEX	AGE	ORDE	Q1	Q2-1	Q2-2	Q2-3	Q2-4	Q2-5	Q2-6	Q2-7	Q2-8	Q2-9	Q2-1	Q3
1	1	4	1	1	3	1	5	5	1	1	5	1	1	2	1
2	1	4	1	5	5	1	5	1	2	4	5	3	1	4	5
3	1	5	1	4	4	2	2	5	3	5	5	1	2	2	2
4	1	4	1	4	2	1	5	5	4	4	5	1	1	5	4
5	1	3	1	2	2	1	1	1	2	1	1	1	1	1	2
6	1	3	1	1	2	1	5	2	1	1	5	1	1	2	1
7	1	4	1	2	1	1	2	1	2	1	2	1	1	1	1
8	2	3	1	5	5	1	5	5	1	2	5	1	1	4	4
9	1	1	1	2	3	2	5	1	4	1	4	4	2	2	2
10	1	3	1	2	3	1	2	1	1	1	2	1	1	1	1
11	1	4	1	1	1	1	1	1	2	2	1	1	1	1	1
12	1	4	1	1	2	1	2	2	2	3	2	1	2	2	2
13	1	2	1	1	1	1	2	1	4	1	2	1	1	2	2
14	2	1	1	3	3	2	3	3	3	3	3	3	1	3	3
15	1	3	1	1	1	1	2	2	1	1	2	1	1	1	1
16	2	4	1	4	3	5	5	5	4	5	5	3	5	5	5
17	2	1	1	2	2	1	1	1	3	3	1	1	1	2	1
18	2	4	1	1	3	1	5	5	1	1	5	1	1	2	1
19	1	3	1	4	4	4	2	2	3	2	4	4	3	4	4
20	1	1	1	4	5	4	4	4	5	5	4	5	4	4	4
21	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1
22	1	1	1	2	2	1	5	2	1	3	5	1	1	2	2
23	1	1	1	1	1	1	2	2	1	1	4	4	1	1	1
24	1	5	1	2	2	2	2	2	1	1	3	3	2	2	2
25	1	2	1	2	2	1	2	2	1	1	4	1	1	1	1
26	1	1	1	4	4	2	2	5	1	2	4	5	1	5	4
27	1	1	1	1	3	1	2	1	1	1	1	1	1	1	1
28	1	2	1	5	5	5	5	5	4	4	5	5	4	4	5
29	1	4	1	4	4	1	5	5	2	2	3	2	1	4	4
30	1	3	1	5	4	3	2	5	3	3	4	5	3	5	5
31	1	1	2	3	3	2	5	3	1	3	4	1	3	3	4
32	2	4	2	1	1	1	2	1	1	2	2	2	1	2	1
33	1	3	2	1	1	3	2	2	1	1	4	1	3	1	1
34	1	4	2	2	2	2	2	4	4	4	2	4	4	2	2
35	1	1	2	2	3	1	5	2	1	3	5	1	1	1	1
36	1	4	2	1	3	1	2	2	1	1	4	1	1	1	1
37	1	3	2	1	1	1	2	2	1	1	2	1	1	1	1
38	1	2	2	5	3	3	5	5	1	2	4	5	4	4	4
39	1	1	2	2	1	1	2	2	1	1	4	1	3	2	2
40	1	3	2	2	2	1	2	1	3	1	4	1	1	2	2
41	1	3	2	2	3	2	2	2	4	1	1	1	1	1	1
42	1	1	2	2	1	2	5	2	1	1	2	1	1	2	2
43	1	4	2	1	1	1	2	2	3	1	2	1	1	2	1
44	1	3	2	5	4	4	5	5	4	4	4	5	1	4	5
45	2	4	2	4	2	2	1	1	4	4	2	1	1	1	4
46	1	4	2	2	2	2	2	2	1	1	1	1	1	1	2
47	2	4	2	1	1	1	5	1	2	1	2	1	1	1	1
48	1	4	2	2	2	1	2	1	2	1	2	1	2	1	2
49	2	5	2	2	3	2	2	2	1	3	2	1	1	1	2
50	1	4	2	1	2	1	5	2	2	1	4	1	1	1	1
51	1	2	2	5	5	3	5	5	4	3	5	4	3	4	5
52	1	3	2	1	1	2	5	2	4	4	2	1	1	1	2
53	2	2	2	2	2	2	2	2	1	1	2	1	1	1	2
54	1	4	2	2	2	2	2	2	1	1	4	1	1	2	2
55	1	3	2	2	3	1	2	2	1	1	4	2	1	1	2
56	1	1	2	1	1	1	2	2	1	1	2	1	1	1	1
57	1	5	2	5	5	5	5	5	4	4	4	5	5	5	5
58	1	2	2	4	4	2	2	5	4	4	5	5	1	1	4
59	1	1	2	1	1	1	5	1	1	1	5	1	1	1	1
60	1	1	2	2	2	2	5	5	1	3	2	1	1	2	2
AVERAGE				2.4	2.5	1.8	3.1	2.7	2.1	2.1	3.2	2.0	1.6	2.2	2.3

1=FEMALE 1=R→S
2=MALE 2=S→R

1=20's
2=30's
3=40's
4=50's
5=60's

Table.8 Consumer test of plain yoghurt in science academy

19 March 1998

Sample R: symbiotic culture 144-14
Sample S: mixed culture 1131+2038

	N											TOTAL POSITIVE			Judgment
		5	4	3	2	1	R	S	R+S						
Q1	60	8	9	2	21	20	17	70.7	41	58				significant difference in 1%	
Q2-1	60	6	7	14	17	16	28.3	71.7	33	46				significant difference in 1%	
Q2-2	60	3	3	4	17	33	10.7	89.3	6	50				significant difference in 1%	
Q2-3	60	23	1	1	31	4	40.7	59.3	24	35				significant difference in 1%	
Q2-4	60	16	2	2	25	15	31.0	69.0	18	40				significant difference in 1%	
Q2-5	60	1	13	7	10	29	26.4	73.6	14	39				significant difference in 1%	
Q2-6	60	3	9	10	7	31	24.0	76.0	12	38				significant difference in 1%	
Q2-7	60	14	18	3	18	7	56.1	43.9	32	25				significant difference in 1%	
Q2-8	60	8	5	4	3	40	23.2	76.8	13	43				significant difference in 1%	
Q2-9	60	2	4	6	5	43	11.1	88.9	6	48				significant difference in 1%	
Q2-10	60	5	9	2	18	26	24.1	75.9	14	44				significant difference in 1%	
Q3	60	7	10	1	19	23	28.8	71.2	17	42				significant difference in 1%	

(1) Preparation date of the samples : 17 March 1998
 (2) Milk solid of the samples : FAT 3.5%, SNF 8.0%
 (3) Qualitative properties of the samples (19 March, after 2days)

R	Acidity(%)	0.88	pH	4.21	Whey separation(%)	39.9	Kinematic viscosity(cst)	1.062
S	Acidity(%)	0.85	pH	4.27	Whey separation(%)	33.2	Kinematic viscosity(cst)	1.185
	Acidity(%)	0.84	pH	4.30	Whey separation(%)		Kinematic viscosity(cst)	
	Acidity(%)	0.83	pH	4.31	Whey separation(%)		Kinematic viscosity(cst)	

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(12/16)

合計	150	106	188	159	127	126	194	118	97	129	144
平均	2.50	1.77	3.13	2.65	2.12	2.10	3.23	1.97	1.62	2.15	2.40
標準偏差	1.27	1.10	1.52	1.55	1.27	1.31	1.39	1.51	1.11	1.34	1.42
件数	60										

相関行列	Q2-1	Q2-2	Q2-3	Q2-4	Q2-5	Q2-6	Q2-7	Q2-8	Q2-9	Q2-10	Q1
Q2-1	1.0000										
Q2-2	0.5357	1.0000									
Q2-3	0.3446	0.2573	1.0000								
Q2-4	0.6142	0.5195	0.4516	1.0000							
Q2-5	0.3468	0.5217	0.0957	0.2676	1.0000						
Q2-6	0.5292	0.5581	0.2853	0.5260	0.6147	1.0000					
Q2-7	0.5169	0.2742	0.5586	0.5166	0.0601	0.3058	1.0000				
Q2-8	0.6096	0.6892	0.1839	0.5317	0.4656	0.4572	0.3689	1.0000			
Q2-9	0.3949	0.7710	0.2075	0.4354	0.3988	0.4601	0.2941	0.5799	1.0000		
Q2-10	0.6606	0.6001	0.4481	0.6847	0.3926	0.5412	0.4897	0.6390	0.5534	1.0000	
Q1	0.8050	0.6369	0.3077	0.6418	0.4572	0.6507	0.4589	0.6707	0.4888	0.8028	1.0000

重回帰式	変数名	偏回帰係	標準偏回	F 値	T 値	P 値	判定	標準誤差	偏相関	単相関
Q2-1	0.482694	0.4333	28.8065	5.3672	0.0000	**	0.089935	0.5863	0.8050	
Q2-10	0.476639	0.4507	28.1455	5.3052	0.0000	**	0.089843	0.5818	0.8028	
Q2-6	0.223059	0.2067	8.2425	2.8710	0.0058	**	0.077695	0.3610	0.6507	
Q2-3	-0.09541	-0.1025	2.4604	1.5686	0.1225		0.060828	-0.2069	0.3077	
定数項	-0.00097		0.0000	0.0035	0.9972		0.275781			

精度	決定係数	修正済決	重回帰係	修正済重	タービソト	赤池のAI
	0.8136	0.8000	0.9020	0.8944	1.5594	121.2740

分散分析表
 要因 偏差平方 自由度 平均平方 F 値 P 値 判定
 回帰変動 97.95577 4 24.48894 60.01061 **
 誤差変動 22.44423 55 0.408077
 全体変動 120.4 59

**1%有意 *5%有意
 ** 判定 **

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	Q2-1	Q2-2	Q2-3	Q2-4	Q2-5	Q2-6	Q2-7	Q2-8	Q2-9	Q2-10
合計	150	106	188	159	127	126	194	118	97	129
平均	2.50	1.77	3.13	2.65	2.12	2.10	3.23	1.97	1.62	2.15
標準偏差	1.27	1.10	1.52	1.55	1.27	1.31	1.39	1.51	1.11	1.34
件数	60									
相関行列	Q2-1	Q2-2	Q2-3	Q2-4	Q2-5	Q2-6	Q2-7	Q2-8	Q2-9	Q2-10
Q2-1	1.0000									
Q2-2	0.5357	1.0000								
Q2-3	0.3446	0.2573	1.0000							
Q2-4	0.6142	0.5195	0.4516	1.0000						
Q2-5	0.3468	0.5217	0.0957	0.2676	1.0000					
Q2-6	0.5292	0.5581	0.2853	0.5260	0.6147	1.0000				
Q2-7	0.5169	0.2742	0.5586	0.5166	0.0601	0.3058	1.0000			
Q2-8	0.6096	0.6892	0.1839	0.5317	0.4656	0.4572	0.3689	1.0000		
Q2-9	0.3949	0.7710	0.2075	0.4354	0.3988	0.4601	0.2941	0.5799	1.0000	
Q2-10	0.6606	0.6001	0.4481	0.6847	0.3926	0.5412	0.4897	0.6390	0.5534	1.0000

重回帰式

変数名	重回帰係	標準偏回	F 値	T 値	P 値	判定	標準誤差	偏相関	単相関
Q2-4	0.235544	0.2721	5.8165	2.4117	0.0193	*	0.097665	0.3118	0.6847
Q2-8	0.192222	0.2160	3.4345	1.8532	0.0693		0.103723	0.2445	0.6390
Q2-1	0.243963	0.2316	4.1895	2.0468	0.0456	*	0.11919	0.2683	0.6606
Q2-3	0.147577	0.1677	3.3924	1.8418	0.0710		0.080125	0.2431	0.4481
Q2-9	0.220897	0.1834	3.3523	1.8309	0.0726		0.120648	0.2418	0.5534
定数項	-0.28166		0.6859	0.8282	0.4112		0.340096		

分散分析表

精度	決定係数	修正済決	重回帰係	修正済重	ターミナル	赤池のAI	自由度	平均平方	F 値	P 値	判定
	0.6539	0.6219	0.8086	0.7886	2.0083	153.6817	5	14.07868	20.40573	0.0000	**
							54	0.689937			**
							59				

***:1%有意 *5%有意

(14/16)

GROUP 1. (R - S)

- I. Preference for R - 11 person
- II. Preference for S - 18 person
- III. Not preference for R and S - 1 person

I. Preference for R - 11 person	
Preference for R	Preference for S
1. Traditional Bulgarian Yoghurt - 4 2. Sour Taste - 3 3. Lactic Acid Taste - 4 4. Better Flavour - 3	1. Bigger Fat Content (Similar with cream) - 2
II. Preference for S - 18 person	
Preference for S	Preference for R
1. Sweet Taste - 5 2. Nature Milk Aroma - 1 3. Good Taste - 6 4. Better Flavour - 3 5. Lactic Acid Taste - 6 6. Similar with cream - 4 7. Better density (structure) - 11	1. Acidity Taste - 1

GROUP 2 (S - R)

- I. Preference for R - 6 person
- II. Preference for S - 23 person
- III. Not preference for R and S - 1 person

I. Preference for R - 6 person	
Preference for R	Preference for S
1. Traditional Bulgarian Yoghurt - 2 2. Bigger Fat Content - 1 3. Lactic Acid Taste - 3 4. Better Flavour - 1 5. Better density (structure) - 2	1. Better density (structure) - 1
II. Preference for S - 23 person	
Preference for S	Preference for R
1. Sweet Taste - 9 2. Bigger Fat Content (similar with cream) - 6 3. Better density (structure) - 11 4. Good Taste - 10 5. Better Flavour - 1 6. Lactic Acid Taste - 2 7. Small acidity - 2	1. Better Acidity Taste - 1
III. Not preference for R or S	
Preference for S	Preference for R
1. Sweet Taste - 1	1. Better Acidity Taste - 1 2. Traditional Bulgarian Yoghurt - 1

(15/16)

**TOTAL PREFERENCE
GROUP 1 (R - S) AND GROUP 2 (S - R)**

- I. Preference for R - 17 person
 II. Preference for S - 41 person
 III. Not preference for R and S - 2 person

I. Preference for R - 17 person	
Preference for R	Preference for S
1. Traditional Bulgarian Yoghurt - 6 2. Bigger Fat Content - 1 3. Lactic Acid Taste - 7 4. Better Flavour - 4 5. Better density (structure) - 2 6. Sour Taste - 3	1. Better density (structure) - 1 2. Bigger Fat Content (Similar with cream) - 2
II. Preference for S - 41 person	
Preference for S	Preference for R
1. Sweet Taste - 14 2. Bigger Fat Content (similar with cream)- 10 3. Better density (structure) - 22 4. Good Taste - 16 5. Better Flavour - 4 6. Lactic Acid Taste - 8 7. Small acidity - 2 8. Nature Milk Aroma - 1	1. Better Acidity Taste - 2
III. Not preference for R or S	
Preference for S	Preference for R
1. Sweet Taste - 1	1. Better Acidity Taste - 1 2. Traditional Bulgarian Yoghurt - 1

(16/16)

Composition of plain yoghurt

Ingredient	Composition (wt%)	FAT (wt%)	SNT (wt%)	PROTEIN (wt%)	TS (wt%)	Unit price (leva/kg)	Amount (leva/kg)	Weight (kg)
Fresh milk		0.00	0.00	0.00	0.00	320.00	0.00	0.00
Skim milk powder		0.00	0.00	0.00	0.00	4000.00	0.00	0.00
Whole milk powder		0.00	0.00	0.00	0.00	5000.00	0.00	0.00
Excellion 833		0.00	0.00	0.00	0.00	9000.00	0.00	0.00
Starter		0.00	0.00	0.00	0.00	320.00	0.00	0.00
Water	100.00							0.00
	100.00	0.00	0.00	0.00	0.00		0.00	

Ingredient	Composition (wt%)	FAT (wt%)	SNT (wt%)	PROTEIN (wt%)	TS (wt%)	Unit price (leva/kg)	Amount (leva/kg)	Weight (kg)
Fresh milk		0.00	0.00	0.00	0.00	320.00	0.00	0.00
Skim milk powder		0.00	0.00	0.00	0.00	4000.00	0.00	0.00
Whole milk powder		0.00	0.00	0.00	0.00	5000.00	0.00	0.00
Excellion 833		0.00	0.00	0.00	0.00	9000.00	0.00	0.00
Starter		0.00	0.00	0.00	0.00	320.00	0.00	0.00
Water	100.00							0.00
	100.00	0.00	0.00	0.00	0.00		0.00	

		FAT (wt%)	SNT (wt%)	PROTEIN (wt%)	TS (wt%)	CHO (wt%)	Ash (wt%)	Casein (wt%)
Fresh milk	(LB)	3.60	8.00	2.90	11.80			
Skim milk powder	(LB)	0.00	96.96	36.06	96.96	52.45	8.45	33.00
Whole milk powder	(LB)	27.13	70.23	25.48	97.36	38.60	6.15	22.80
Excellion 833		3.00	93.00	62.00	96.00			
Starter								
Fresh milk	(JAPAN)	3.60	8.50	3.10	12.10	4.60	0.70	
Skim milk powder	(JAPAN)	1.00	95.50	34.00	96.50	53.30	7.90	
Whole milk powder	(JAPAN)	26.00	71.20	25.00	97.20			

Effect of stabilizer Excellion on plain yoghurt (1)

< Preparation condition for plain yoghurt >

1. Composition of yoghurt mix ; FAT:3.60%, SNF:8.40%
2. Kinds of stabilizer
 - ① Excellion 300 : 1.0%
 - ② Excellion 310 : 1.0%
 - ③ Excellion 806 : 1.0%
 - ④ Excellion 814 : 1.0%
 - ⑤ Excellion 833 : 1.0% (control)

Every stabilizer was added before pasteurization

3. Pasteurization condition ; more than 90°C, 5min

4. Starter ; symbiotic culture 41-14, inoculation volume: 1.5%

5. Fermentation temperature ; 43°C in production department

Fermentation process and qualitative properties of the yoghurt (after 1 day)

	Solubility	Fermen- tation time	Acidity before cooling	Whey s.p before cooling	Acidity after 1 day	pH	Whey separation (%)		Texture	Total preference	
							Filter method 1	Filter method 2			
Excellion 300	good	2:00	75TH	- (few)	100TH	4.40	8.8	9.1	24.0	smooth	best
Excellion 310	good	2:00	75TH	± (few)	95TH	4.50	17.6	16.9	25.4	smooth	good
Excellion 806	very bad	2:00	75TH	++ (much)	110TH	4.38	17.5	20.9	33.5	rough	bad
Excellion 814	best	2:00	74TH	++ (much)	105TH	4.47	17.6	15.0	30.7	rough	bad
Excellion 833	good	2:00			118TH	4.10	29.4	24.0	30.6	normal	neutral

* Filter method 1 ; Filter paper was used. Sample volume: 60g (without mixing). Filter for 15min

* Filter method 2 ; Filter paper was used. Sample volume: 60g (after mixing 20times with spoon). Filter for 15min

* Centrifuge method ; SIGMA centrifuge was used. Sample volume: 50g (after mixing 20times with spoon). 3000rpm, 10min, 20°C

Effect of stabilizer Excellion on plain yoghurt (2)

< Preparation condition for plain yoghurt >

1. Composition of yoghurt mix : FAT:3.30%, SNF:8.19%

2. Kinds of stabilizer and concentration

① Excellion 300 : 0.5%

② Excellion 300 : 0.75%

③ Excellion 300 : 1.0%

④ Excellion 300 : 1.0% (control)

Every stabilizer was added before pasteurization

3. Pasteurization condition : more than 90°C, 5min

4. Starter : symbiotic culture 28-22, inoculation volume: 1.5%

5. Fermentation temperature : 43°C in production department

Fermentation process and qualitative properties of the yoghurt (after 1 day)

Stabilizer	Solubility	Fermen- tation time	Acidity before cooling	Whely s.p before cooling	Acidity after 1 day	pH	Whely separation (%)		Texture	Total preference
							Filter method	Centrifuge method		
Excellion 300	0.50%	good	72TH	—	98TH	4.32	19.2	17.9	creamy	good
Excellion 300	0.75%	good	72TH	—	99TH	4.32	14.3	16.8	creamy	pretty good
Excellion 300	1.00%	good	72TH	—	103TH	4.31	10.8	11.0	creamy	pretty good
Excellion 833	1.00%	good	72TH	—	105TH	4.33	22.0	19.4		good

Preservation test (after 7 days at 5°C)

Stabilizer	Acidity	pH	Whely separation (%)		Texture
			Filter method	Centrifuge method	
Excellion 300	0.50%				
Excellion 300	0.75%				
Excellion 300	1.00%				
Excellion 833	1.00%				

* Filter method : Filter paper was used. Sample volume: 50g (after mixing 20times with spoon), Filter for 15min

* Centrifuge method : SIGMA centrifuge was used. Sample volume: 50g (after mixing 20times with spoon), 3000rpm, 5min, 20°C

(3/3)

Effect of kinematic viscosity of *S.thermophilus* on plain yoghurt (1)

< Preparation condition for plain yoghurt >

1. Composition of yoghurt mix : FAT:3.50%, SNF:8.50% (without stabilizer)
 2. Pasteurization condition : more than 90°C, 5mir.
After pasteurization, yoghurt mix was divided into 4 parts
 3. Starter culture (Mixed culture method)
 - ① *S.thermophilus* N-2 : *L.bulgaricus* No.2038 = 2 : 1 (K.Viscosity of N-2 : 1.093cst)
 - ② *S.thermophilus* N-5 : *L.bulgaricus* No.2038 = 2 : 1 (K.Viscosity of N-5 : 1.192cst)
 - ③ *S.thermophilus* N-8 : *L.bulgaricus* No.2038 = 2 : 1 (K.Viscosity of N-8 : 1.261cst)
 - ④ *S.thermophilus* N-10 : *L.bulgaricus* No.2038 = 2 : 1 (K.Viscosity of N-10 : 1.340cst)
- Mother starters were inoculated directly in the ratio of 2 : 1 with total volume of 2%
- Every *S.thermophilus* was isolated from Nestle yoghurt

5. Fermentation temperature : 43°C in production department

Fermentation process and qualitative properties of the yoghurt (after 1 day)

Combination	Mother starter		Fermen- tation time	Acidity before cooling	Whcy s.p before cooling	Acidity after 1 day	pH	Whcy separation (%)		Kinematic viscosity (cst)	Texture	Total preference
	Acidity (S.therm)	K.Viscosity (S.therm)						Filter method	Centrifuge method			
N-2 : No.2038	1.18	1.049	2:45	72TH	much	0.80	4.52	25.0	28.8	1.049		
N-5 : No.2038	0.95	1.108	2:45	72TH	much	0.78	4.56	17.7	20.9	1.142	viscous	good
N-8 : No.2038	1.00	1.128	2:45	72TH	much	0.80	4.54	21.3	17.0	1.143	viscous	
N-10 : No.2038	0.99	1.137	2:45	72TH	much	0.78	4.55	20.7	18.1	1.137	viscous	

* Filter method : Filter paper was used. Sample volume: 50g (after mixing 20times with spoon). Filter for 15min

* Centrifuge method : SIGMA centrifuge was used. Sample volume: 50g (after mixing 20times with spoon). 3000rpm, 5min. 20°C

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