

Ex-Post Evaluation Report
on
the Fermented Dairy Products Development Project
in the Republic of Bulgaria

ブルガリア共和国はっ酵乳製品開発計画
事後評価報告書

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Japan International Cooperation Agency
Sofia, Bulgaria

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Japan International Cooperation Agency (hereinafter referred to as "JICA") has conducted Ex-Post evaluation and for the preparation of necessary conclusions for the Fermented Daily Products Development Project in the Republic of Bulgaria (hereinafter referred to as "the Project"),

This Ex-Post Evaluation Report (hereinafter referred to as "the Report") has been prepared with the kindly cooperation the Ministry of Agriculture and Food Supply (hereinafter referred to as "MAF"), the Ministry of Economy and Energy (hereinafter referred to as "MEE"), the Capital Inspection for Veterinary and Sanitary Control (CIVSC) and LB Bulgaricum PLC.

The Evaluation has been conducted in the form of interviews, field surveys and discussions. As a result, JICA presents to the respective institution the Report contents.

PHOTOS



TECHNICAL COOPERATION MEMORIAL PLATE



LB BULGARICUM PLC



LB BULGARICUM LABORATORY



LB BULGARICUM LABORATORY



LB BULGARICUM PRODUCTS



LB BULGARICUM NEW PRODUCTS



LB BULGARICUM LABORATORY



CIVSC REFERENCE LABORATORY



CIVSC REFERENCE LABORATORY

事後評価調査結果要約表

評価実施部署: ブルガリア駐在員事務所

1. 案件の概要			
国名：ブルガリア共和国	案件名：ブルガリアはっ酵乳製品開発計画		
分野：畜産加工	援助形態：プロジェクト方式技術協力		
所轄部署：農業開発協力部畜産園芸課	協力金額：741 百万円		
協力期間	(R/D) 1 July 1997 – 30 June 2002		
	(F/U) December 2002 – December 2004		
	先方関係機関： 農業林業省、中央検査所、LBブルガリカム社		
	日本側協力機関： 農林水産省生産部、明治乳業		
関連協力			
1-1. 協力の背景と概要			
<p>ヨーグルト、市乳、バター、チーズなどの乳製品は、ブルガリア国の伝統かつ主要な日常の糧であり、国民に必要な良質の栄養源を提供するには、主要産業の1つである乳業の振興は不可欠であると考えられている。ブルガリア国では、世界的にもまれな豊富な乳酸菌の収集が行われているにもかかわらず、乳酸菌コレクションを保有している国営企業（LBブルガリカム社）の技術レベルの未熟さ、機材の老朽化、市場調査の不足等により、コレクションをスターター（種菌）としてほとんど活用されていない状況であった。また、一方では、市場経済の導入後、家畜が個人へ配分されたことにより、全国的に酪農経営規模の縮小化が起こり、それに伴い源乳量の急激な減少と乳質の低下につながった。</p> <p>このような状況下、ブルガリア国政府は、乳酸菌コレクションを有効に活用すると同時に、原料乳品質を改善するための技術移転を目的とするプロジェクト方式技術協力の要請を我が国に対して行った。</p> <p>これを受けて国際協力事業団（JICA。（現）国際協力機構）は、1996年12年に実施協議調査団を派遣して、討議議事録（Record of Discussions: R/D）の署名を取り交わし、1997年7月1日から5年間の計画で、「ブルガリアはっ酵乳製品開発計画」を開始した。また、1998年6月には運営指導調査団が派遣され、詳細実施計画（Tentative Detailed Implementation Plan: TDIP）を策定し、2000年3月には中間評価調査団の派遣、2002年1月には終了時評価調査団派遣が派遣された。プロジェクト終了後、2002年12月から2004年12月の2年間フォローアップ協力として専門家を派遣した。</p>			
1-2. 協力内容			
(1) 上位目標：国際競争力をもったブルガリア国の酪農製品が発展する。			
(2) プロジェクト目標： プロジェクトサイトにおいてはっ酵乳製品及び原料乳品質管理技術が改良・開発される。			
(3) 成果			
1) 原料乳品質管理及びその検査手法の現状が確認される。			
2) 原料乳品質検査手法が改良され普及する。			
3) 収集された乳酸菌の特性評価手法が確立される。			
4) 新・改良されたスターターが利用される。			
5) ヨーグルト製造技術が向上する。			
(4) 投入(プロジェクト終了時)			
日本側：			
長期専門家派遣	9名	機材供与	232 百万円
短期専門家派遣	17名	ローカルコスト負担	30 百万円
研修員受入	14名		
相手側：			
カウンターパート配置	延べ26名	機材購入(試薬類含む)	11 百万円相当
土地・施設提供	メインサイト及びサブサイト	ローカルコスト負担	
その他(施設改装費)	16 百万円相当		

2. 評価調査団の概要		
評価調査団	独立行政法人 国際協力機構ブルガリア駐在員事務所 エレナ・カライヴァノヴァ博士（ローカルコンサルタント）	
評価調査期間	22/ 10/ 2007 - 8/ 11/ 2007	評価種類：事後評価
3. 案件の実施		
3-1. プロジェクト目標の状況		
<p>プロジェクト実施目標・成果には、ブルガリアにおける乳製品の品質改良および新製品の開発、新スターターの開発と利用、原料乳品質検査技術の改良等々があげられ、事後評価の結果は、プロジェクト実施により、高品質の新はっ酵乳製品開発がなされたとともに、LBブルガリカム社によるスターター（種菌）供給によるブルガリアはっ酵乳製品部門全体への肯定的な影響があることを示している。また、中央検査所は、原料乳品質の改良のための最新検査システムを確立できた等、プロジェクト目標の達成がみられる。</p>		
3-2. 上位目標の達成状況		
<p>ブルガリアの乳製品業者は、西欧民間企業により生産された乳製品スターター（種菌）の輸入に影響する、高競争率の市場経済状況下にあるが、まさにこの状況により本プロジェクトの成果が顕著に重要視されている。ブルガリアの原料乳の品質改良により、はっ酵乳製品の品質改良と生産量増大がなされたとともに、ヨーグルト生産技術の向上が見られ、はっ酵乳製品の種類と国内市場は、民間乳製品業者の成長による拡大が見られる。また、LBブルガリカム社は、この状況下、人材能力・資格およびモチベーションの重要性をも認識し業務を行っており、主に外国のはっ酵乳製品・スターター（種菌）生産業者に対する国際競争力の増大対策にあたっている。</p>		
3-3. 終了時評価での提言の活用状況		
<p>終了時評価およびプロジェクト終了時におけるインパクトは考慮されるとともに、提言事項に対するフォローアップが見られる。提言事項は忠実に守られており、プロジェクト実施による肯定的なインパクトが長期にわたり続くとともに、プロジェクト成果の自立発展が続く結果を招いている。適切な人材配置により効果的運営が見られるようになるとともに、プロジェクトにより導入された機材および技術移転により得たノウハウが適切に使用されているという結果を出しているとともに、ブルガリアのはっ酵乳製品業者への技術指導とスターター（種菌）の普及という結果を招いている。標準ラボラトリーとしてプロジェクトサブサイトの中央検査所は、提言どおり原料乳品質検査技術を全国の原料乳管理機関に普及している。全国的な原料乳品質検査システム制度化の実施手段についても、ブルガリアの乳製品分野戦略に明記されている状況である。</p>		
4. 評価結果の概要		
4-1. 評価結果の概要		
4.1.1 インパクト		
<p>ブルガリアにおけるはっ酵乳製品及び原料乳の品質改良・開発の点において本プロジェクトの目標はほぼ達成されたといえる。両カウンターパート機関（LBブルガリカム社と中央検査所）への機材供与、日本人専門家による研修実施、技術移転・ノウハウの伝授により、カウンターパート機関の能力向上および科学的、技術的、生産的な飛躍が見られ、両機関の専門家は、本プロジェクトをつうじて取得した技術および知識を駆使し、EU融資の改革プロジェクトに申請するなど、従業員の能力向上によるますますの両機関の能力向上を目指して努力を続けている。プロジェクトをつうじて供与された新機材の使用と新分析方式の導入により、全国的な原料乳品質管理センターの開発とブルガリア乳製品の品質改善が可能となっている。プロジェクトの両カウンターパート機関は相互協力を続けており、その結果を互いの利としている。例えばLBブルガリカム社は中央検査所における原料乳の発酵検査用にスターターを供給したり、技術移転協力や乳酸菌を含めた細菌数測定手段の標準化にかかる協力等を行なっている。その他、LBブルガリカム社は、プロジェクト中に開発されたカルシウム強化ヨーグルトを含む高品質はっ酵乳製品の生産や、スターター（種菌）のブルガリア民間はっ酵乳製品業者への提供なども行っている。本プロジェクトは、国内市場における国際競争力を持つ製品を育むという全国的なインパクトを持っているともいえ、本プロジェクト実施の結果として、競争力増大と高品質なブルガリアはっ酵乳製品製造が可能となるとともに、はっ酵乳製品全体の品質および種類は著しく改良された。（LBブルガリカム社の例として、3種類の新しいヨーグルト製品を開発している。）</p> <p>2002年以降のカウンターパート機関の業績は、プロジェクト目標が達成された結果といえ、例えばブルガリア政府が行なった全国規模の原料乳品質調査は、プロジェクトにより導入・技術指導が行われた分析機材を適切に使用できることにより実現している。また、2004年の結果として、良品原料乳の占める割合が以前の10%から30%に増加していることが確認されている。その他プロジェクトのインパクトとして、原料乳・はっ酵乳製品の品質管理における国際基準（国際</p>		

酪農連盟基準)の両カウンターパート機関への導入があげられる。原料乳・はっ酵乳製品の品質検査マニュアルの作成とともに、中央検査所、農業食品供給省(旧農林省)関係職員および民間はっ酵乳業者へのトレーニングを実施している。

また、当初予想していなかった肯定的インパクトとして、本プロジェクト関係者によれば、中央検査所とLBブルガリカム社職員に語学力を含め、案件起案準備・実施にかかる技能が著しく向上・改善するという結果がでている。

4.1.2 自立発展性

4.1.2.1 技術面

2007年のEU加盟とともに、ブルガリア政府はEU基準を踏まえた品質改良実施のため、本プロジェクト実施中に導入した原料乳分析・検査システムに補助金を交付し、同システムの拡張を図っている。

中央検査所に供与された機材は、効果的かつ適切に使用されており、2003年-2004年に政府により実施された国家原料乳調査にも使用されている。LBブルガリカム社については、供与された機材の使用により、より高品質な製品の開発、乳製品の新しいスターター(種菌)開発・導入、民間企業へのスターター供給が可能となっている。また、この両カウンターパート機関は、新規採用職員へのトレーニングに加え、職員全体の能力向上のためにトレーニングやセミナーを実施している。それに加え、伝統的ブルガリアの乳酸菌およびはっ酵製品はブルガリアの国宝と見なされていることから、ブルガリアの経済開発にかかる乳製品部門の重要性をブルガリア政府は認識しており、乳製品の品質の改良への努力を試みている。あえて自立発展性の障害になりえるのは、プロジェクトによる導入機材が高稼働率で使用されていることからくる、スペアパーツの早期およびよりタイムリーな購入が必要な点にある。

4.1.2.2 組織/人材面

本プロジェクトにより、従業員のモチベーションやチームワークの向上などの肯定的影響があったのに加え、LBブルガリカム社はプロジェクトをつうじて改善された技術と知識を駆使し、ブルガリア中小企業振興庁が支援するプロジェクトを勝ち取ることができるまでのレベルに達している。両カウンターパート機関は、新規採用職員へのトレーニング実施、学習コースの設置やセミナーを開催するなど、職員の能力向上に努力している。また、プロジェクトの結果、語学力が重要視されるようになり、職員の語学コース参加が奨励されている。全般的に、高い市場競争力を持つ魅力的な多数の民間乳製品企業の設定・発展およびEU加盟による外国での職場開拓の可能性が出現したことにより、両カウンターパート機関内部に変化の兆しが見られる。

4.1.2.3 財政面

中央検査所は国家予算により運営されている機関であり、LBブルガリカム社は独立採算制の国営企業である。LBブルガリカム社は、改良を施したはっ酵乳製品の販売増加により、より多くの収益を得ることができるが、中央検査所の場合、サンプルの分析手数料は国の規定によるため、予定外の収益アップ等は望めず、機材の維持管理・修理に対するフレキシブルな財政配慮に弱い。ブルガリア政府は機材の維持管理・修理にかかる予算を考慮し、財政的支援の配慮が必要である。両機関の機能は、ブルガリアの原料乳およびはっ酵乳製品の品質、伝統的な味と特性を持ったはっ酵乳製品の製造にとって重要であり、国による支援と努力が必要とされると思料される。

4.2. プロジェクトの促進要因

4.2.1 インパクト発現を促進した要因

全般的な社会的・経済的成長が続いていることが、プロジェクトのインパクトをさらに促進しているとおもわれるが、特にEU加盟が乳製品の品質改良・EU基準達成のための努力を促す要因ともなっており、ブルガリアの乳製品業者は、西側企業との競争増大により、技術的・手法における支援を中央検査所およびLBブルガリカム社により求めるようになった。多くの民間はっ酵乳製品製造業者が、生産設備改良と検査・分析設備に投資するようになってきており、最新技術の導入とより良質のスターター(種菌)への関心が高まっている。したがって、本プロジェクトは、技術移転、最新の分析・検査方法およびスターター(種菌)の開発をつうじて、持続的にインパクト

トを示し続けているといえる。また、良質な原料乳の必要性の増加は、原料乳生産者への品質情報のフィードバックのフローを含む、検査システムの確立が特に価値あるものとして見られるようになった。

4.2.2 自立発展性強化を促進した要因

ブルガリアのはっ酵乳製品部門における状況改善が見られることがプロジェクト成果の自立発展性をより促進していると思われる。乳製品の品質に対する厳格なEUの政策と規定及び消費者の要求と期待の増大は、プロジェクトによる効果をさらに飛躍させていると思われる。また、環境保全・生態学にかかるEU政策・規定の導入・適用により、ブルガリア特有の乳酸菌の宝庫（山岳地方や人口密度の低い森林地帯）が、今後の産業汚染・家庭用廃棄物による汚染から保護されることが期待されており、今後ともプロジェクトをつうじて開始された新しい乳酸菌の収集・特性評価業務及びそれらによる新しいスターターの開発努力の継続を促進していくと思われる。

4.2.3 その他の促進要因

自立発展性が期待される要因は、ブルガリア国民が伝統的な味と特性を備えたオリジナルなブルガリア乳製品の消費に前向きな姿勢を示している傾向があることで、この状況は、西側企業の製品とは異なる、ブルガリアの伝統的なヨーグルトやチーズのスターター（種菌）の使用・販売を促進していくと考える。

4.3. プロジェクトの阻害要因

4.3.1 インパクト発現を阻害した要因

はっ酵乳製品とスターター（種菌）市場に出現した競争相手の増大があげられる。この市場への新しく開発されたはっ酵乳製品の参入は、安価であり多種にわたる輸入製品との競争のために困難となっている。ブルガリアで生産される原料乳量はまだ十分ではないとともに、その大部分は、衛生条件の改善・衛生規定を満たす能力があまりない小酪農家で生産されていることも原因と考える。

4.3.2 自立発展性強化を阻害した要因

ブルガリア市場への大量の西側はっ酵乳製品の流入により、従来のブルガリア伝統の味とは異なる味を好む傾向も一部現れ始めている。

状況として、ダノン国内最大級の国有はっ酵乳企業セルディカ-ソフィアを買収するとともに、最新製造過程および多種はっ酵乳製品の全国販売網を開発し、スタータ（種菌）を生産する西側民間企業（クリストファー・ハンゼン、ダニスコ等）は、ブルガリア市場に参入して、乳製品加工業者に対し比較的安価のスターターを紹介している。

また、EU諸国へ輸出許可を持つブルガリアはっ酵乳製品の輸出を制限するEUの政策により、ブルガリアのはっ酵乳製品部門の自立発展性にネガティブな影響が出ると考えられる。

4.3.3 その他の阻害要因

伝統的なブルガリアはっ酵乳製品製造方法の保存・保護とともに、銘柄・商標の登録制度と保護制度の確立のために、ブルガリア政府には、十分な努力が見られないことが指摘され、配慮が必要と考える。

4.4 結論

事後評価調査の結果、プロジェクトの実施成功および成果の長期にわたるインパクトが見られる。プロジェクト終了後5年を経た現在でも、特にカウンターパート機関の組織的キャパシティー向上を含む、ブルガリアはっ酵乳製品部門への持続的・肯定的なインパクトが継続して見られる。

今後考慮すべき点は、中央検査所に導入されている機材の維持管理に対する適切な予算配慮とフレキシブルな財政的配慮を行うこと、また、安価なはっ酵乳製品を提供する外国企業との市場競争の増大や、十分とはいえない特性を持つスターター（種菌）流入の可能性も考慮して活動を行なう必要があることである。

4.5 提言

- (1) プロジェクトの成果を維持・発展させるためにも中央検査への十分な予算措置を国がもっと配慮すること。人材の管理活用、供与機材の適切な維持管理が今後とも継続して行われること。スペアパーツの供給が容易に行われ、維持管理が容易に実施できるようにすること。上記事項はブルガリア中小企業振興庁との実施予定案件にても問題とならないように考慮すべき事項である。(4.1.2.1、4.1.2.3参照)
- (2) LB ブルガリカム社は、今後とも国際的に競争率の高いはっ酵乳製品の開発に寄与するとともに、ブルガリアの乳製品工場への技術指導を継続すべき。その目的のために、研究・開発活動の良好な運営に適切な人員を割り当てるとともに、十分な資格を持つ有能な科学者や従業員を得るために、より活発で継続的な努力を行うこと。(4.1.2.2参照)
- (3) サブサイト(中央検査所)は、プロジェクトで確立された原料乳の品質検査技術を他の品質管理機関に普及し、中心的な役割を果たす検査所として今後とも原料乳品質管理システムの強化に努めること。これにより、より効果的に全国的な原料乳管理制度化がなされると考える。(4.1.1参照)
- (4) 原料乳の品質改善は、高品質な乳製品の生産に重要であるため、必要な生産促進対策や最新設備・機材の設置のための予算措置と人員確保がブルガリア政府に求められる。(4.1.2.3参照)
- (5) LB ブルガリカム社が市場競争に打ち勝ち市場を拡大するためには、より柔軟な現代的財政管理の導入が望まれる。(4.3.2参照)
- (6) 伝統的なブルガリアはっ酵乳製品製造方法の保存・保護とともに、銘柄・商標の登録制度と保護制度の確立のために、ブルガリア政府の努力が望まれる。(4.3.3参照)

4.6 教訓

プロジェクトの効率的実施には、管理担当者が関係国家機関に配置されるべきである。また、プロジェクトの重要性と目的をより多くの国民に伝える必要があるとともに、伝統的なブルガリアのはっ酵乳製品の生産を保護するために行っている政府の努力に対する社会の支援と関心を高めることが必要である。

今後ともプロジェクト実施効果を増大させていくためには、中央検査所のフレキシブルな財務配慮が必要であり、LBブルガリカム社においては、研究・開発担当職員に対する報償等の可能性を考慮すべきである。

両カウンターパート機関は、自立発展性の促進のためにも、資格と能力とともに語学力をも備えた職員を引き付ける魅力を備える努力が必要である。最近の高競争市場化により、LBブルガリカム社におけるより適切かつ革新的な経営と生産活動管理の配慮がと要求される。それには、機材の適切な使用と維持管理は不可欠である。

収入源の多様化(例:ブルガリア中小企業振興庁機関との案件、EUファンド案件)によりカウンターパート機関の組織的・生産的キャパシティの向上およびフレキシブルな財政管理と人材管理が可能となるものと思料される。

他の状況

2007年1月1日、ブルガリアはEUメンバーとなり、「援助国化」することとなった。そのためブルガリアは技術協力の「ノウハウ」を学ぶ必要性から、JICAの援助経験は非常に有益であると考えている。もし、ブルガリアが「はっ酵乳製品」分野の技術協力を考えた場合、JICAは、援助国化を進めるブルガリアの努力を支援し、関連分野においてブルガリア専門家への「ノウハウ」伝授に協力できるものと考えている。

Summary

Evaluation conducted by: JICA Bulgaria Office

1. Outline of the Project			
Country: Bulgaria	Project title: The Fermented Dairy Products Development Project in the Republic of Bulgaria		
Issue/Sector: Animal Products Processing	Cooperation scheme : Project-type Technical Cooperation		
Division in charge: Agricultural Development Cooperation Department	Total cost: 741 Million Yen		
Period of Cooperation	(R/D) 1 July 1997 – 30 June 2002	Partner Country's Implementing Organization: Ministry of Agriculture and Forestry, LB Bulgaricum PLC, Capital Inspection for Veterinary and Sanitary Control (CIVSC)	
	(F/U) December 2002 – December 2004	Supporting Organization in Japan: Agricultural Production Bureau of Ministry of Agriculture, Forestry and Fisheries, Meiji Dairies Corporation	
Related Cooperation			
1-1. Background of the Project			
<p>Dairy products such as pasteurized milk, yoghurt, butter and cheese are traditional and staple parts for the daily diet in Bulgaria. Hence, development of Bulgaria's dairy processing industry is recognized for its importance in the health of its people. The state-owned LB Bulgaricum PLC utilizes a rich collection of lactic acid bacteria but due to (1) limited technology, (2) obsolete facilities and (3) a lack of research on the market economy, the company has been unable to make full use of the collection as starters of dairy products. Since the introduction of the market economy, livestock were divided among individual farmers, which resulted in a diminished farming scale across the country. This also caused a marked decrease in the output and quality of raw milk and fermented dairy products. Under these circumstances, the Bulgarian Government made requested the Japanese Government to implement Project-type Technical Cooperation in order to (1) fully utilize its lactic acid bacteria know-how and (2) to improve the quality of dairy products.</p> <p>After finalizing the Project as a follow-up cooperation, another JICA Expert was dispatched for the period of two years from December 2002 to December 2004.</p>			
1-2. Project Overview			
(1) Overall Goal			
Development of fermented dairy products with internationally competitive quality in Bulgaria.			
(2) Project Purpose			
Improvement/Development of technologies for fermented dairy products and raw milk quality control at project sites.			
(3) Outputs			
1) The present situation of raw milk quality control and inspection are identified.			
2) Improved methods for raw milk quality control and inspection are disseminated.			
3) Characterization analyses on collected lactic acid bacteria are made.			
4) New/improved starters are utilized.			
5) Technologies for yoghurt production are upgraded.			
(4) Inputs (as of the Project's termination)			
Japanese side:			
Long-term Expert	9	Equipment	232 Million Yen
Short-term Expert	17	Local cost	30 Million Yen
Trainees received	14		
Bulgarian Side:			
Counterpart	26		
Equipment (including reagents)		11 Million Yen	
Renovation of Facilities		16 Million Yen	

2. Evaluation Team	
JICA Bulgaria Office Ms. Elena.Karaivanova, Ph.D (Consultant)	
Type of Evaluation: Ex-post	Period of evaluation: 22/ 10/ 2007 - 08/ 11/ 2007
3. Ex-Post Project Performance	
3-1 Performance of the Project purpose	
<p>To clarify whether the Project implementation has achieved the aimed purposes: improvement of the quality, variety of the dairy products in Bulgaria, development and application of novel starters, improvement of the control on the quality of the raw milk in Bulgaria, etc. The results from the Ex-Post evaluation study indicate that the Project purpose was successfully realized: the Project implementation led to the development of high-quality novel dairy products, the provision of starters by LB Bulgaricum has a positive influence on the dairy sector in Bulgaria and CIVSC established an up-to-date system for control and improvement of the quality of the raw milk.</p>	
3-2 Achievement related to Overall Goal	
<p>The Bulgarian dairy producers are exposed to highly competitive economical conditions. This includes the production of starters in regards to the import of dairy starters produced by private companies from Western Europe, which has an immediate impact on the Project outcomes. The improved quality of the raw milk in Bulgaria resulted in better quality of the dairy products and increased production amounts; technologies for yoghurt production are upgraded. The variety of dairy products and the domestic market was significantly increased as a result of the development of private dairy producers. LB Bulgaricum faces increasing competition, mainly from foreign dairy and starter culture producers. In this regard, the importance of the personnel qualification and motivation was recognized.</p>	
3-3 Follow-up of the Recommendations by Terminal Evaluation Study	
<p>The impact of the terminal evaluation and the connection with the termination of the Project is taken into account and the effects of the follow-up of the recommendations are monitored. Recommendations are followed properly and this resulted in prolonged positive impact of the Project implementation and sustainability of the Project outcomes. The adequate assigning of personnel conferred effective management. This resulted in a proper utilization of the equipment and know-how delivered by the Project and dissemination of technical guidance and starters to Bulgarian dairy producers. The sub-site CIVSC as a reference laboratory provides analytical technologies on raw milk quality analysis to other institutions controlling raw milk as recommended. Measures for institutionalizing the system for raw milk quality analysis countrywide is described in the Bulgarian strategy for the dairy sector.</p>	
4. Results of Evaluation	
4-1. Summary of Evaluation Results	
4.1.1 Impact	
<p>The Overall Goal of the Project has been achieved in terms of improvement/development of the quality of the dairy products and raw milk in Bulgaria. The provision of equipment to the counterparts, training by Japanese experts and transfer of technology and know-how resulted in increase of the institutional capacities of the counterparts and scientific, technological and production excellence. As a result of the acquired skills and knowledge the personnel of LB Bulgaricum and CIVSC is successfully competing for EU-financed innovation projects for further development of the capabilities of both institutions and improvement of the competence of the employees. The development of the nation-wide centers for control of the quality of the raw milk and improvement of the quality of Bulgarian dairy products are enabled due to the implementation of the new equipment and the new methods for analysis and control. The Counterparts of the Project are continuing to cooperate with each other and profit mutually from this cooperation. LB Bulgaricum supplies CIVSC with starters for conduction of fermentation experiments with raw milk. Both institutions are collaborating in the transfer of methodologies and standardized microbiological procedures for determination of bacterial cell counts, including <i>Bifidobacteriae</i> and lactic acid bacteria. LB Bulgaricum is producing high-quality dairy products, including the calcium-enriched yogurt developed during the Project calcium-enriched yoghurt, and provides private dairy producers in Bulgaria with starter cultures. Therefore the Project has nation-wide impact providing internationally competitive products on the domestic market. The overall quality and variety of dairy products was significantly improved as a result of the implementation of the Project due to the increased competition and</p>	

the availability of high-quality Bulgarian dairy products. For instance, only as an immediate result of Project implementation 3 novel yoghurt products were developed by LB Bulgaricum.

The achievements of the Counterpart institutions for the period after 2002 are an immediate result of the completion of the Project Overall Goal. The Bulgarian state has sponsored a nation-wide study of the status of the quality of the raw milk in Bulgaria which was possible only due to the appropriate application of the analytical equipment introduced in the course of the Project. Importantly, the results indicate that the portion of the quality raw milk was increased from 10% to 30% in year 2004. As a result of the impact of the Project international standards for control of the quality of the raw milk and dairy products were introduced in both Counterpart institutions (i.e. the standards of the International Dairy federation). Manuals for investigation of the quality of the raw milk and dairy products and trainings of co-workers from the National Veterinary Sanitary Service and MAF, as well as personnel of private dairy producer laboratories were performed.

The Project had an unexpectedly good impact in terms of influence on the personal professional skills of the employees of CIVSC and LB Bulgaricum, according to the opinion of the participants of the Project.

An important impact of the Project on the CIVSC and LB Bulgaricum employees is the increase of the language knowledge and significant improvement of the skills in preparation and accomplishment of projects.

4.1.2 Sustainability

4.1.2.1 Technological Aspects

In 2007 Bulgaria became member of the EU and therefore in order to improve the milk quality according to the EU standards, the Bulgarian government subsidizes the system for analysis and control of the raw milk introduced as a result of the implementation of the Project and has a plan to expand this system.

The equipment is used properly and effectively. The technique for milk analysis is expected to be fully utilized for the implementation of the national plan and has been actively utilized during the state-sponsored study of the quality of the raw milk in Bulgaria 2003 – 2004. The equipment delivered to LB Bulgaricum enabled expansion of its production list with products of higher quality, development and introduction of novel starters for dairy production, supply of private Bulgarian dairy producers with starter cultures. Since the equipment provided by the JICA Project is being used intensively, a minor obstacle for the technological sustainability of the Project is the fast and in time acquisition of spare parts.

4.1.2.2 Organizational/Human Resources Aspect

The Project implementation has extended positive influence on the employees in terms of personal motivation, team-work and cooperativeness. The improved skills and knowledge allowed the personnel of LB Bulgaricum to apply for and profit from projects financially supported by the Bulgarian Small and Medium Enterprises Promotion Agency. Both Counterpart institutions expend intensive labors in training new employees, increase of the professional qualifications of the personnel by organizing training courses and seminars. As a result of the Project the importance of good language skills is recognized and the employees are encouraged to attend language courses. Generally, there is an increased, but still moderate turnover ratio in both Counterpart institutions due to the establishment and development of numerous highly-competitive attractive private dairy companies and the improved possibilities for career abroad as a result of the EU entrance.

4.1.2.3 Financial Aspects

CIVSC is supported financially by Bulgarian government and LB Bulgaricum is a self-supported state company. The sales of upgraded dairy products of LB Bulgaricum provide the company with additional financial incomes. Although no exact information was available on the exact budget of the Counterpart institutions (partially due to confidentiality reasons), the budgets of both institutions are sufficient to secure their proper functioning.

A matter of concern is the prices for analysis of samples by CIVSC, which are fixed by a decree of Bulgarian government and therefore restricts the means for profit, which results in lack of flexibility for maintenance and repair of equipment acquired from the Project. Therefore the Bulgarian government should provide particularly annual financial support for maintenance and repair of the equipment.

We consider that further measures of the Bulgarian government are needed for support of both institutions, since their functioning is of crucial importance for the quality of the raw milk and dairy products in Bulgaria, as well as for the production of dairy products with traditional original taste and properties.

4-2. Analysis of factors that have promoted Project

4.2.1 Impact

The overall successful social and economic development of Bulgaria promoted the impact of the Project. Particularly, the entrance into EU intensified the efforts for improvement of the quality of dairy products and achievement of EU standards. Increased competition with Western companies stimulated Bulgarian dairy producers to look for technological and methodological help CIVSC and LB Bulgaricum, since there is overall positive attitude to the traditional Bulgarian dairy products. Many private dairy producers invested in improvement of production facilities and equipment for control analysis. There is an increasing interest in the implementation of upgraded technologies for yoghurt production and better starters. Therefore the Project exhibits a continuing impact by providing technology, modern analysis methods and starters. The increased need for high-quality raw milk makes the established control system, including feedback information flow to the farmers, particularly valuable.

4.2.2 Sustainability

The improvement of Bulgarian dairy sector promotes the sustainability of the Project's outcome. More strict regulations in accordance with EU policy and increased consumer's requirements and expectations with respect to the quality of the dairy products further supports the ongoing efficacy of the Project. Notably, the introduction and application of EU regulations (i.e. Natura 2000) regarding the environmental preservation and ecological policies are expected to protect Bulgarian national reservoirs for isolation of novel lactic acid bacteria (mountain regions and isolated forest areas with low population density) from industrial contamination which will promote the continuation of the efforts for isolation and characterization of new lactic acid isolates and development of starter cultures resulting from the Project implementation.

4.2.3 Others

A factor that is expected to have a positive effect on the Project sustainability is the already existing overall positive attitude of the Bulgarian population for consumption of original Bulgarian dairy products with traditional taste and properties. This circumstance might promote the usage and sales of starter cultures for traditional Bulgarian yoghurt and chesses, unlike the ones offered by Western competitors.

4-3. Factors that have inhibited project

4.3.1 Impact

The impact of the Project was limited to some extent as a result of the increased competition on the market of dairy products and starter cultures. The introduction of dairy products on the market is difficult with respect to the low prices and the increased variety of imported dairy products.

The amount of raw milk produced in Bulgaria are still not satisfactory, and a large part of it is produced by small family farms with restricted capabilities for further improvements of the hygienic conditions and fulfillment of strict sanitary regulations.

4.3.2 Sustainability

The massive invasion of foreign dairy products on the Bulgarian market is going to change the traditional preference for traditional Bulgarian dairy products. For instance, Danone acquired one of the biggest state-owned dairy producers, namely Serdika-Sofia and developed a modern production and nation-wide distribution of variety of dairy products. Private Western companies producing starter cultures (Chr. Hansen, Danisco, etc.) invaded the Bulgarian market and introduced to the dairy producers relatively cheap dairy starters. The EU policy for restriction of the amounts of Bulgarian dairy products (so-called "milk quotes") allowed to be exported in other EU countries are expected to have a negative effect on the entire Bulgarian dairy sector.

4.3.3 Others

There are not sufficient and persistent governmental efforts for the preservation, registration and protection of the traditional Bulgarian dairy products, names and brands.

4-4. Conclusions

The results of the Ex-Post Evaluation Study indicate successful long-lasting impact of the Project implementation and results. There is a sustainable positive impact on the entire Bulgarian dairy sector 5 years after termination of the Project, as well as particularly on the institutional capacity of the Counterpart

institutions. Matters of concern are the proper financing of the equipment maintenance, lack of financial flexibility in CIVSC due to governmental regulations, the increased competition with foreign companies offering cheap dairy products and starters with unsatisfactory properties.

4-5. Recommendations

- (1) Further allocation of necessary budget for CIVSC should be provided by the Bulgarian government.; Good management of assigned personnel, proper operation and maintenance of equipment provided are required to sustain/develop outcomes of the Project. Better supply of spare parts and technological assistance for repairs of the delivered equipment. This issues might be addressed in a future project with the Bulgarian Small and Medium Enterprises Promotion Agency (see 4.1.2.1 and 4.1.2.3)
- (2) LB Bulgaricum should continue to contribute to the development of internationally competitive fermented dairy products and to provide technical guidance to dairy products factories in Bulgaria. For that purpose, LB Bulgaricum should make efforts to assign personnel appropriate for the good management of the Research & Development activities and to apply more active and permanent efforts to attract qualified scientists and employees (see 4.1.2.2)
- (3) The sub-site (CIVSC) should continue to disseminate the acquired analytical technologies on raw milk quality analysis to other institutions controlling raw milk quality, and contribute to strengthen the system for raw milk quality control, as a reference laboratory. This should result in more effective institutionalization the system for raw milk quality analysis countrywide (see 4.1.1).
- (4) Improvement of the quality of raw milk is important for high-quality dairy products production. The Bulgarian government should allocate necessary budget and assignment of necessary personnel for the implementation of measures to promote the production of high quality milk and modernization of facilities/equipment (see 4.1.2.3)
- (5) Flexible and modern economic management of LB Bulgaricum is needed for successful competition on the market and expansion (see 4.3.2)
- (6) More persistent governmental efforts are needed for the preservation, registration and protection of the traditional Bulgarian dairy products, names and brands (see 4.4).

4-6. Lessons Learned

For the efficient implementation of the Project, should be assigned administrator in the relevant governmental institutions. Popularization of the significance of the Project and its goals in the society is needed in the future in order to gain positive public attitude towards the governmental efforts to support the production of traditional Bulgarian dairy products. In order to increase the effectiveness of Project implementation, one should optimize the financial flexibility of CIVSC and provide possibilities for additional financial stimulation of the LB Bulgaricum employees involved in the research and development. It is obvious that both institutions should be able to attract and motivate qualified personnel with good language skills for promotion of the sustainability. The highly-competitive market situation nowadays requires adequate and innovative management and production practices in LB Bulgaricum. For this purpose, the proper maintenance and further modernization of the equipment is a must. Additional sources of incomes and financial diversification (i.e. projects with Bulgarian Small and Medium Enterprises Promotion Agency, EU funds) would increase the institutional and production capacity of the Counterparts and allow flexible economic and human resources management.

4.7 Follow-up Situation*

**There is no need of Follow-up Cooperation.*

Other Situation:

On January 1st, 2007 Bulgaria became an EU member, and now turns into a “Donor Country”. Due to the specifics of the Technical Cooperation, Bulgaria needs to receive “know-how”, and that is why JICA’s experience in the field might turn very useful. In this connection, if Bulgaria decides to implement Technical Cooperation in the sphere of “Fermented Dairy Products” and finds it necessary, JICA could support Bulgaria’s efforts in becoming a “donor country” and transfer “know-how” to the Bulgarian experts concerning the related field.

Contents

Picture

Summary (in Japanese, English)

1. OUTLINE OF THE EVALUATION STUDY

- 1.1 Project Background
- 1.2 Project Overview
- 1.3 Study Objectives
- 1.4 Scope of Work
- 1.5 Constraints of the Study
- 1.6 Evaluation team
- 1.7 Study Period

2. METHODOLOGY

- 2.1 Evaluation Questions
- 2.2 Methodology
- 2.3 Schedule of the Study

3. EX-POST PROJECT PERFORMANCE

- 3-1 Performance of Project Purpose
- 3-2 Achievement related to Overall Goal
- 3-3 Follow-up of the Recommendations by Terminal Evaluation Study

4. RESULTS

- 4.1 Impact of the Project
 - 4.1.1 Achievement of the expected impacts
 - 4.1.2 Casualty between the Project and the Impacts
 - 4.1.3 Unexpected Significant Positive/Negative Impacts
- 4.2 Sustainability of the Project
 - 4.2.1 Technological Aspects of Sustainability
 - 4.2.2 Organizational/Human Resources Aspects of Sustainability
 - 4.2.3 Financial Aspects of Sustainability
- 4.3 Analysis of Factors that have promoted Project
 - 4.3.1 Impact

4.3.2 Sustainability

4.3.3 Others

4.4 Analysis of Factors that have inhibited Project

4.4.1 Impact

4.4.2 Sustainability

4.4.3 Others

4.5 Conclusions

5. RECOMMENDATIONS AND LESSONS LEARNED

5.1 Recommendations to Counterpart

5.2 Lessons learned for JICA and Counterpart

6. FOLLOW-UP SITUATION

ANNEXES

1. Opinion by Head of “Probiotics” laboratory, LB Bulgaricum PLC.
2. Program of the course – Classical and New Methods for Physico-Chemical and Microbiological control in the Dairy Industry.
3. Program of the course – Technological Requirements for Improvement of the Quality of Bulgarian Yogurt”
4. Report by CIVSC “Testing Laboratory”
5. Project Design Matrix (PDM)
6. Evaluation Grid
7. Organization Chart of the Project
8. Third Party Review by External Exper

1. OUTLINE OF THE EVALUATION STUDY

1.1 Project Background

Dairy products, such as pasteurized milk, yoghurt, butter and cheese, are traditional and staple parts of the daily diet in Bulgaria, and development of dairy farming and the dairy-processing industry is recognized to have economic importance for the country. However, since the introduction of the market economy, the output of raw milk and fermented dairy products has been decreasing remarkably, as has the quality of these products.

The starter industry plays a crucial role in the fermented dairy sector. LB Bulgaricum PLC (hereinafter referred to as "LB Bulgaricum") is designated as the sole state-owned company authorized to produce starter for dairy products. Due to limited technology and obsolete facilities, LB Bulgaricum has had problems fully utilizing its rich collection of lactobacilli as well as supplying starter to meet both domestic and international requirements for better quality.

Under these circumstances, the Bulgarian Government made a request to the Japanese Government for the implementation of project-type technical cooperation in order to improve the quality of dairy products and to fully utilize lactic acid bacteria collection.

In response, JICA dispatched an implementation study team to Bulgaria in December 1996, and started project-type of technical cooperation over a five-year plan that began on July 1, 1997. A mutual consultation team was dispatched in August 1998 to work out the Detailed Implementation Plan (DIP), a mid-term evaluation team was dispatched in March 2000 and terminal (final) evaluation study team was dispatched in January 2002. The follow-up cooperation embraced two years period: after finalizing the Project another JICA Expert was dispatched from December 2002 to December 2004.

The Project was transferred to LB Bulgaricum (the main site), including the techniques of analyzing the characteristics of lactic acid bacteria, developing dairy products and producing starters. The Project also developed techniques on the production of dairy products and a manual. In Capital Inspection for Veterinary and Sanitary Control, (hereinafter referred to as "CIVSC") (the sub-site), measuring analyzing techniques were transferred to staff in order to improve the management of the quality of raw milk.

1.2 Project Overview

(1) Overall Goal

Development of fermented dairy products with internationally competitive quality in Bulgaria.

(2) Project Purpose

Improvement/Development of technologies for fermented dairy products and raw milk quality control at project sites.

(3) Outputs of the Activities

- 1) The present situation of raw milk quality control and inspection were identified.
- 2) Improved methods for raw milk quality control and inspection were disseminated.
- 3) Characterization and analysis of collected lactic acid bacteria are made.
- 4) New/improved starters were utilized.
- 5) Technologies for yoghurt production were upgraded.

1.3 Study Objectives

The objective of the study is to evaluate the impact and sustainability of the Project achievements over time. This includes the maintenance of the technical, organizational, economic, socio-cultural, and environmental aspects of the Project realization, including the financial side and the factors influencing the sustainability of the Project outcomes. Conclusions and recommendations for JICA and the Counterparts are formulated based on the results of the study.

1.4 Scope of Work

The scope of the evaluation comprises inspections activities on the sites (LB Bulgaricum and CIVSC), MAF, private dairy producers. The Evaluation consultant performs interviews, questionnaires and discussions with Counterparts employees, experts, Project participants and officials. Survey on published manuals, scientific papers is performed. Improvements of the dairy starters production supply and quality, novel lactic acid bacteria implemented in the production process and realization of novel products are investigated. The effective and proper usage of the equipment delivered in the course of the Project as well as the

maintenance of the technologies for dairy production and control of the quality of the raw milk introduced as a result of the Project activities five years after the termination of the Project are monitored. Conclusions regarding the continuous effects of the implementation of the Project on the general quality and variety of Bulgarian dairy products and the quality of raw milk are made.

1.5 Constraints of the Study

The activities of the study are restricted to the impacts of the Project on the dairy sector in Bulgaria generally and its influence on the effectiveness and excellence in all terms (organizational, technical, organizational, economic, socio-cultural, environmental and scientific). The study is based on the available information on the dairy market situation in Bulgaria and the quality of the raw milk. The study is not aimed to investigate the above mentioned issues in details, but to extract the important information on the influence of the results of the Project implementation on the Bulgarian dairy sector its provision of high-quality starters and raw milk particularly, as well as to focus on the invention of novel healthy dairy products and their realization on the market..

1.6 Evaluation team

Mr. Takeshi Komori, Resident Representative, JICA Bulgaria Office (Team Leader)

Mr. Ken Nagai, Program Officer, JICA Bulgaria Office

Dr. Elena Karaivanova, Local Consultant

Supported by:

Ministry of Agriculture and Food Supply (MAF) Mr. Georgi Nedjalkov, Head, Milk Quota Div.	Ministry of Economy and Energy (MEE) Mr. Radoslav Stanolov, Chief Expert, Donor Programmes and International Aid for Development Dept.
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Capital Inspection for Veterinary and Sanitary Control (CIVSC) Dr. Dimitar Kunchev, Director Dr. Elina Todorova, Head, Test Laboratory	LB Bulgaricum PLC Eng. Hristo Yungarev, President Dr. Svetlana Minkova, Licence and R&D manager
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1.7 Study period

The Ex-Post evaluation embraces the period after the Terminal Evaluation (January 2002) and completion of the Project (June 2002). The Study itself was performed in approximately one month (October – November, 2007).

2. METHODOLOGY

2.1 Evaluation Questions

The evaluation questions were aiming to:

- 1) Evaluate the overall achievement and continuity of the Project outcomes in terms of lasting impact and sustainability in organizational, financial, scientific, socio-economical and environmental terms.
- 2) Identifying the problems and recommending necessary measures to be taken for the improvement influence of the results of the Project performance over time.
- 3) Considering the lessons drawn from the Project activities in order to reflect them in future projects in the interest of making them more effective and efficient.

2.2 Methodology

Evaluation activities were conducted by the Evaluation Consultant. These activities included interviews, report analysis, field survey and discussions with concerned officials /staff members and participants in the Project.

(1) Impact:

A term indicating whether the Project implementation still has an effect on its surroundings in terms of technical, economic and socio-cultural, institutional, and environmental factors.

(2) Sustainability:

The extent to which the objectives of the Project continue after the Project is completed; also, the extent to which the groups affected by the Project want to and can take charge themselves to continue accomplishing its objectives. Sustainability is concerned with measuring whether an activity or an impact is likely to continue after donor funding has been withdrawn. The Project needs to be environmentally, financially, and socially sustainable.

2.3 Schedule of the Study

The Ex-Post Evaluation Consultant spent sixteen (16) days from October 22 to November 8, 2007 in Sofia, and carried out the following activities:

- (1) Brief review of f the activities resulted form the Project performance
- (2) Inspections on site
- (3) Discussion in individual sections with JICA experts and the counterpart

personnel;

- (4) Consultation meetings and with MAF and MEE executive officials; and
- (5) Analysis of the observations and findings identified during the meetings.

Time of the visits, meetings and inspections:

LB Bulgaricum	29.10.2007
	30.10.2007
	01.11.2007
CIVSC	31.10.2007
	05.11.2007
	07.11.2007
MAF	06.11.2007

3. EX-POST PROJECT PERFORMANCE

3-1 Performance of the Project purpose

To clarify whether the Project implementation has achieved the aimed purposes: improvement of the quality, variety of the dairy products in Bulgaria, development and application of novel starters, improvement of the control on the quality of the raw milk in Bulgaria, etc. The evaluation emphasizes on the continuance of the results of the Project. The evaluation covers all important aspects of the project impact and sustainability. The results from the Ex-Post evaluation study indicate that the Project purpose was successfully realized. The Project implementation led to the development of high-quality novel dairy products. The provision of starters by LB Bulgaricum has a positive influence on the dairy sector in Bulgaria. CIVSC established an up-to-date system for control and improvement of the quality of the raw milk.

3-2 Achievement related to Overall Goal

The focus is on the development of dairy products with internationally competitive quality in Bulgaria as a result of the project and the influence of external factors and the important causal relations. Notably, Bulgaria is a member of the European Union since January 2007 and this has changed substantially the legislative environment. The Bulgarian dairy producers are exposed to highly competitive economical conditions. This includes the

production of starters in regard to the import of dairy starters produced by private companies from Western Europe, which has an immediate impact on the Project outcomes. The improved quality of the raw milk in Bulgaria resulted in better quality of the dairy products and increased production amounts; technologies for yoghurt production are upgraded. The variety of dairy products and the domestic market was significantly increased as a result of the development of private dairy producers. Importantly, LB Bulgaricum as a state-owned company faces increasing competition, mainly from foreign dairy and starter culture producers. In this regard, the importance of the personnel qualification and motivation was recognized.

3-3 Follow-up of the Recommendations by Terminal Evaluation Study

The impact of the terminal evaluation and the connection with the termination of the Project is taken into account. The effects of the follow-up of the recommendations are monitored. Results indicate that the recommendations are followed properly and this resulted in prolonged positive impact of the Project implementation and sustainability of the Project outcomes. The adequate assigning of personnel conferred effective management. This resulted in a proper utilization of the equipment and know-how delivered by the Project and dissemination of technical guidance and starters to Bulgarian dairy producers. The sub-site CIVSC as a reference laboratory provides analytical technologies on raw milk quality analysis to other institutions controlling raw milk as recommended. Measures for institutionalizing the system for raw milk quality analysis countrywide is described in the Bulgarian strategy for the dairy sector.

4. EVALUATION RESULTS

4.1 Impact of the Project

4.1.1 Achievement of the expected impacts

The Overall Goal of the Project has been achieved in terms of improvement/development of the quality of the dairy products and raw milk in Bulgaria. The provision of equipment to the counterparts, training by Japanese experts and transfer of technology and know-how resulted in increase of the institutional capacities of the counterparts and scientific,

technological and production excellence. As a result of the acquired skills and knowledge the personnel of LB Bulgaricum and CIVSC is successfully competing for EU-financed innovation projects for further development of the capabilities of both institutions and improvement of the competence of the employees.

The CIVSC laboratory is functioning actively as the only national reference laboratory for control and analysis of the quality of the raw milk. The equipment delivered in the course of the Project is used properly and the results from the analysis are obtained in a day. The laboratory operates with farmers from all parts of Bulgaria. Moreover, the laboratory is training the employees and experts from MAF dealing with the quality of the raw milk.

LB Bulgaricum serves as an excellence national center for starters and dairy products. The equipment introduced as a result of the project implementation is used for further development of novel starters and dairy products. Additionally, LB Bulgaricum continues its program for isolation and characterization of lactic acid bacterial strains, including performance of contemporary molecular biology typing of the isolates and assessment of their production potential and possible probiotic effects (see ANNEX 1). LB Bulgaricum is organizing training courses and programs for control and improvement of dairy production technologies, microbiological and physicochemical control, proper application of starter cultures, etc. (ANNEX2 and ANNEX3*). The research data obtained during the Project are collected as a database in the library and are available for the employees. LB Bulgaricum is producing high-quality dairy products, including the calcium-enriched yogurt developed during the Project, and provides private dairy producers in Bulgaria with starter cultures (for obstacles regarding these issues discussed in 4.4). Only as an immediate result of Project implementation 3 novel yoghurt products were developed by LB Bulgaricum. It is worth to mention that the Counterparts of the Project are continuing to cooperate with each other and profit mutually from this cooperation. LB Bulgaricum supplies CIVSC with starters for conduction of fermentation experiments with raw milk. Both institutions are collaborating in the transfer of methodologies and standardized microbiological procedures for determination of bacterial cell counts, including *Bifidobacteriae* and lactic acid bacteria.

The Project has nation-wide impact providing internationally competitive products on the domestic market. The overall quality and variety of dairy products was significantly improved as a result of the implementation of the Project due to the increased competition and the availability of high-quality Bulgarian dairy products.

** The courses and programs in the Annexes are only exemplary, for the respective years, and do not embrace all activities in this regard.*

4.1.2 Causality between the Project and the Impacts

The achievements of the Counterpart institutions for the period after 2002 are an immediate result of the completion of the Project Overall Goal. The development of the nation-wide centers for control of the quality of the raw milk and improvement of the quality of Bulgarian dairy products are enabled due to the implementation of the new equipment and the new methods for analysis and control. For instance the Bulgarian state has sponsored a nation-wide study of the status of the quality of the raw milk in Bulgaria which was possible only due to the appropriate application of the analytical equipment introduced in the course of the Project. This study embraced mainly raw milk producers in North-West Bulgaria as the main raw milk production region in Bulgaria (ANNEX 4).

More than 10 000 samples have been investigated during 2003 and the portion of the quality raw milk was ca. 10%. In 2004 after more than 10 000 samples investigated the portion was already ca. 30%, thus indicating the improvement of the overall quality of the raw milk in Bulgaria. As a result of the impact of the Project international standards for control of the quality of the raw milk and dairy products were introduced in both Counterpart institutions (i.e. the standards of the International Dairy federation). Manual for investigation of the quality of the raw milk and dairy products was edited in 2003.

The increased technological, organizational and scientific skills of the employees as a result of the Project impact allowed both counterpart institutions to train co-workers from the National Veterinary Sanitary Service and MAF, as well as personnel of private dairy producer laboratories.

4.1.3 Unexpected Significant Positive/Negative Impacts

The Project had an unexpectedly good impact in terms of influence on the

personal professional skills of the employees of CIVSC and LB Bulgaricum, according to the opinion of the participants of the Project.

An important impact of the Project which was not originally particularly intended is the increase of the language knowledge of the CIVSC and LB Bulgaricum employees. In addition, the participation in the Project has led to significantly improved skills in preparation and accomplishment of projects. For instance as a result of a successful PHARE project two laboratories in Stara Zagora and Lovech were supplied with Milcoscan and Fossmotic apparatuses and people from the respective laboratories were trained to work with Bactoscan.

4.2 Sustainability of the Project

4.2.1 Technological Aspects

According to the MEE, the promotion of high technologies and food industry is a prior subject in Bulgaria in terms of the industrial development. In order to improve the milk and dairy products quality it is important to develop technologies of raw milk quality control. In 2007 Bulgaria became member of the EU. In order to improve the milk quality, the Bulgarian government subsidizes the system for analysis and control of the raw milk introduced as a result of the implementation of the Project and has a plan to expand this system. An accurate milk analysis is an essential technique for implementing this plan.

The technique for milk analysis, which CIVSC acquired, is expected to be fully utilized for the implementation of the national plan. The equipment is used properly and effectively. It has been actively utilized during the state-sponsored study of the quality of the raw milk in Bulgaria 2003 – 2004. The equipment delivered to LB Bulgaricum enabled expansion of its production list with products of higher quality, development and introduction of novel starters for dairy production, supply of private Bulgarian dairy producers with starter cultures. Since the equipment provided by the JICA Project is being used intensively, a minor obstacle for the technological sustainability of the Project is the fast and in time acquisition of spare parts.

4.2.2 Organizational/Human Resources Aspect

Beside the above discussed overall beneficial effects of the Project on the

professional capabilities and qualifications of the CIVSC and LB Bulgaricum personnel, the Project implementation has extended positive influence on the employees in terms of personal motivation, team-work and cooperativeness, as witnessed from the interviewed participants in the Project. The improved skills and knowledge allowed the personnel of LB Bulgaricum to apply for and profit from projects financially supported by the Bulgarian Small and Medium Enterprises Promotion Agency. As a result of the improved professional capabilities after the completion of the Project, three experts who had attended training in Japan, acquired positions at the MAF. Both Counterpart institutions expend intensive labors in training new employees, increase of the professional qualifications of the personnel by organizing training courses and seminars. In addition similar activities are being undertaken for students from the University for Food technologies, Plovdiv, and food-technology specialized high-schools.

As a result of the Project the importance of good language skills is recognized and the employees are encouraged to attend language courses.

Generally, there is an increased, but still moderate turnover ratio in both Counterpart institutions due to the establishment and development of numerous highly-competitive attractive private dairy companies and the improved possibilities for career abroad as a result of the EU entrance.

4.2.3 Financial Aspects

CIVSC is a state institution and LB Bulgaricum is a state-owned company. CIVSC is supported financially by Bulgarian government and LB Bulgaricum is a self-supported state company. Bulgarian government recognizes the importance of the dairy sector for the development of Bulgarian economy and takes measures for improvement of the quality of the dairy products. The traditional Bulgarian lactic acid bacteria and products thereof are considered as a precious resource of Bulgaria.

The sales of upgraded dairy products of LB Bulgaricum provide the company with additional financial incomes. Nevertheless, the improved and stable economic situation in Bulgaria and the market invasion of foreign starter producers and dairy products hampers the successful realization of LB Bulgaricum products to some extent.

Additional matter of concern is the prices for analysis of samples by

CIVSC, which are fixed by a decree of Bulgarian government and therefore restricts the means for profit. This results in lack of flexibility for maintenance and repair of equipment acquired from the Project. Therefore the Bulgarian government should provide particularly annual financial support for maintenance and repair of the equipment.

We consider that further measures of the Bulgarian government are needed for support of both institutions, since their functioning is of crucial importance for the quality of the raw milk and dairy products in Bulgaria, as well as for the production of dairy products with traditional original taste and properties.

4.3 Analysis of factors that have promoted Project

4.3.1 Impact

The overall successful social and economic development of Bulgaria promoted the impact of the Project. Particularly, the entrance into EU intensified the efforts for improvement of the quality of dairy products and achievement of EU standards. Increased competition with Western companies stimulated Bulgarian dairy producers to look for technological and methodological help CIVSC and LB Bulgaricum, since there is overall positive attitude to the traditional Bulgarian dairy products. Many private dairy producers invested in improvement of production facilities and equipment for control analysis. There is an increasing interest in the implementation of upgraded technologies for yoghurt production and better starters. Therefore the Project exhibits a continuing impact by providing technology, modern analysis methods and starters. The increased need for high-quality raw milk makes the established control system, including feedback information flow to the farmers, particularly valuable.

4.3.2 Sustainability

The improvement of Bulgarian dairy sector promotes the sustainability of the Project's outcome. More strict regulations in accordance with EU policy and increased consumer's requirements and expectations with respect to the quality of the dairy products further supports the ongoing efficacy of the Project. Notably, the introduction and application of EU regulations (i.e. Natura 2000) regarding the environmental preservation and ecological

policies are expected to protect Bulgarian national reservoirs for isolation of novel lactic acid bacteria (mountain regions and isolated forest areas with low population density) from industrial contamination which will promote the continuation of the efforts for isolation and characterization of new lactic acid isolates and development of starter cultures resulting from the Project implementation.

4.3.3 Others

A factor that is expected to have a positive effect on the Project sustainability is the already existing overall positive attitude of the Bulgarian population for consumption of original Bulgarian dairy products with traditional taste and properties. This circumstance might promote the usage and sales of starter cultures for traditional Bulgarian yoghurt and chesses, unlike the ones offered by Western competitors.

4.4 Analysis of Factors that have inhibited Project

4.4.1 Impact

The impact of the Project was limited to some extent as a result of the increased competition on the market of dairy products and starter cultures. The introduction of new dairy products on the market is difficult with respect to the low prices and the increased variety of imported dairy products.

The amount of raw milk produced in Bulgaria is still not satisfactory, and a large part of it is produced by small family farms with restricted capabilities for further improvements of the hygienic conditions and fulfillment of strict sanitary regulations.

4.4.2 Sustainability

The massive invasion of foreign dairy products on the Bulgarian market is going to change the traditional preference for traditional Bulgarian dairy products. For instance, Danone acquired one of the biggest state-owned dairy producers, namely Serdika-Sofia and developed a modern production and nation-wide distribution of variety of dairy products. Private Western companies producing starter cultures (Chr. Hansen, Danisco, etc.) invaded the Bulgarian market and introduced to the dairy producers relatively cheap dairy

starters. The EU policy for restriction of the amounts of Bulgarian dairy products (so-called “milk quotes”) allowed to be exported in other EU countries is expected to have a negative effect on the entire Bulgarian dairy sector.

4.4.3 Others

There are not sufficient and persistent governmental efforts for the preservation and protection of the traditional Bulgarian dairy production as well as for legislative registration and protection of original Bulgarian dairy product names and brands.

4.5 Conclusions

The results of the Ex-Post Evaluation Study indicate successful long-lasting impact of the Project implementation and results. There is a sustainable positive impact on the entire Bulgarian dairy sector 5 years after termination of the Project, as well as particularly on the institutional capacity of the Counterpart institutions. Still, to some extent matters of concern are the proper financing of the equipment maintenance, lack of financial flexibility in CIVSC due to governmental regulations, the increased competition with foreign companies offering cheap dairy products and starters with unsatisfactory properties.

5. RECOMMENDATIONS AND LESSONS LEARNED

5.1 Recommendations to counterpart

The following measures are recommended as necessary to sustain and further develop the achievements of the Project.

- (1) Further allocation of necessary budget for CIVSC should be provided by the Bulgarian government. Good management of assigned personnel, proper operation and maintenance of equipment provided are required to sustain/develop outcomes of the Project. Better supply of spare parts and technological assistance for repairs of the delivered equipment. This issues might

be addressed in a future project with the Bulgarian Small and Medium Enterprises Promotion Agency (see 4.2.1 and 4.2.3)

- (2) LB Bulgaricum should continue to contribute to the development of internationally competitive fermented dairy products and to provide technical guidance to dairy products factories in Bulgaria. For that purpose, LB Bulgaricum should make efforts to assign personnel appropriate for the good management of the Research & Development activities and to apply more active and permanent efforts to attract qualified scientists and employees (see 4.2.2).
- (3) The sub-site (CIVSC) should continue to disseminate the acquired analytical technologies on raw milk quality analysis to other institutions controlling raw milk quality, and contribute to strengthen the system for raw milk quality control, as a reference laboratory. This should result in more effective institutionalization the system for raw milk quality analysis countrywide (see 4.1.1).
- (4) Improvement of the quality of raw milk is important for high-quality dairy products production. The Bulgarian government should allocate necessary budget and assignment of necessary personnel for the implementation of measures to promote the production of high quality milk and modernization of facilities/equipment (see 4.2.3)
- (5) Flexible and modern economic management of LB Bulgaricum is needed for successful competition on the market and expansion (see 4.4.2).
- (6) More persistent governmental efforts are needed for the preservation, registration and protection of the traditional Bulgarian dairy products, names and brands (see 4.5).

5.2 Lessons Learned for Counterpart.

For the efficient implementation of the Project, should be assigned administrator in the relevant governmental institutions who fully understands the significance of the Project in the National Development Plan. More popularization of the significance of the Project and its goals in the society is needed in the future in order to gain positive public attitude towards the governmental efforts to support the production of traditional Bulgarian dairy

products. In order to increase the effectiveness of Project implementation, one should optimize the financial flexibility of CIVSC and provide possibilities for additional financial stimulation of the LB Bulgaricum employees involved in the research and development. It is obvious that both institutions should be able to attract and motivate qualified personnel with good language skills for promotion of the sustainability. The highly-competitive market situation nowadays requires adequate and innovative management and production practices in LB Bulgaricum. For this purpose, the proper maintenance and further modernization of the equipment is a must. Additional sources of incomes and financial diversification (i.e. projects with Bulgarian Small and Medium Enterprises Promotion Agency, EU funds) would increase the institutional and production capacity of the Counterparts and allow flexible economic and human resources management.

6. FOLLOW-UP SITUATION*

**There is no need of Follow-up situation.*

Other Situation:

On January 1st, 2007 Bulgaria became an EU member, and now turns into a “Donor Country”. Due to the specifics of the Technical Cooperation, Bulgaria needs to receive “know-how”, and that is why JICA’s experience in the field might turn very useful. In this connection, if Bulgaria decides to implement Technical Cooperation in the sphere of “Fermented Dairy Products” and finds it necessary, JICA could support Bulgaria’s efforts in becoming a “donor country” and transfer “know-how” to the Bulgarian experts concerning the related field.

OPINION

By Michaela Michaylova
Head of „Probiotics” laboratory
LB BULGARICUM PLC, Sofia Bulgaria

CONCERNING: Advantage of JICA „Fermented Dairy Products Development Project” in Bulgaria

The transfer of technologies and equipment during the five years project gave to LB BULGARICUM the possibility to do research at contemporary level. It contributes the company to gain project “Development of new starters for dairy products with health properties” co-financed by National Innovation Fund as well as to take part as partner in another projects. The work concerning the enrichment and characterization of the company bacterial collection started during JICA project is continuing at present time. Based on the results obtained during the project the following report was published:

FEMS Microbiol Lett 269 (2007) 160-169.



Isolation and characterization of *Lactobacillus delbrueckii* ssp. *bulgaricus* and *Streptococcus thermophilus* from plants in Bulgaria

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DOI:10.1111/j.1574-6968.2007.00631.x

Abstract

One of the traditional ways of preparation of yogurt starter in Bulgaria is placing a branch of a particular plant species into boiled sheep's milk maintained at about 45 °C, which is further incubated until a dense coagulum is obtained. To investigate the possible origin of the yogurt starter bacteria, *Lactobacillus delbrueckii* ssp. *bulgaricus* (*L. bulgaricus*) and *Streptococcus thermophilus* (*S. thermophilus*), the traditional way of yogurt-starter preparation was followed. Hundreds of plant samples were collected from four regions in Bulgaria and incubated in sterile skim milk. The two target bacteria at low frequencies from the plant samples collected were successfully isolated. Phenotypic and genotypic characteristics of these bacterial isolates revealed that they were identified as *L. bulgaricus* and *S. thermophilus*. Twenty isolates of *L. bulgaricus* and *S. thermophilus*, respectively, were selected from the isolated strains and further characterized with regard to their performance in yogurt production. Organoleptic and physical properties of yogurt prepared using the isolated strains from plants were not significantly different from those prepared using commercial yogurt-starter strains. It was therefore suggested that *L. bulgaricus* and *S. thermophilus* strains widely used for commercial yogurt production could have originated from plants in Bulgaria. To our knowledge, this is the first report on the isolation and characterization of *L. bulgaricus* and *S. thermophilus* strains from plants.



APPENDIX 1.

PROGRAM OF THE COURSE

**CLASSICAL AND NEW METHODS FOR PHYSICO-CHEMICAL AND
MICROBIOLOGICAL CONTROL IN THE DAIRY INDUSTRY**

**05 Feb 2007 – 09 Feb 2007
LB BULGARICUM PLC - SOFIA
RESEARCH AND DEVELOPMENT CENTER**

05 Feb 2007

Monday

9,30 Registration and opening of the course.

Lectures

11,00 Information on the safety principles in the microbiological laboratory

14,00 Growth media, applied in the microbiological practice.
Rules for growth media preparation. Sterilization.
Preparation of samples for analysis. General rules for
microbiological analysis. Surface inoculation and calculation of
the number of colonies (CFU).
Inoculation of broth media and calculation of the number of bacteria
with the “most probable number” tables(MPN).

Lecturer Z. Nikolov

Exercise

14,00 Microscope. General scheme. Determination of the surface of the visible area
17,30 with a micrometer. Calculating the factor of the microscope. Staining of
somatic cells. Enumeration technique. Determination of the number of
somatic cells in raw milk according to BDS EN ISO 13366-1

Lecturer Z. Nikolov

06 Feb 2007

Tuesday

Exercise

8,30 Technique for microscope slide preparation. Methods for
16,30 staining:
A. Staining with methylene blue.
B. Staining acc. to Gram.

Contemporary methods for detection of inhibitors in milk.
Determination of the total bacterial counts - BDS ISO 6610;
Yeasts and moulds - ISO 6611; Coliforms - ISO 4832.
Information on the principles and techniques for analyses of samples and tests by parameters: Salmonella – BDS EN ISO 6579;
Escherichia coli- BDS EN ISO 16649 -2; Enterobacteria - ISO 21528-1;
staphylococci -ISO 5594.

Lecturer: Zh. Atanassova

07 Feb 2007

Wednesday Lectures

8,30 Basic principles for safety in the chemical laboratory
9,30 Methods for sampling and physico-chemical analysis.

Lecturer M. Spassova

Exercise

13,00 Analyses of milk: Acidity, pH, fat content, dry matter, total
16,30 protein/casein, mineral content, lactose by Shoorl, lactose -
enzymatic method (Boehringer)

Lecturers: M. Spassova, G. Velichkova

08 Feb 2007

Thursday Exercise

8,30 Physico-chemical analysis : cream, cheese, dry products (powdered
16.30 milk and whey).
Information on the methods for detection of the most frequent adulterations of milk. Analysis of washing and disinfecting preparations. Determination of the activity of rennin.

Lecturers: M. Spassova, V. Krasteva

09 Feb 2007

Friday Exercise

8,30 Application of pure cultures for the production of dairy products.
16,00 Bacteriophages and methods for their detection. Measures against phage infections.
Performing a sensory evaluation.

16.00 Discussion on the contents of the course. Filling in a questionnaire

Lecturers: Z. Urshev, M. Spassova, P. Pavlov

17,30 Distribution of certificates for successful completion of the course.
Closing the course.

APPENDIX 2

PROGRAM OF THE COURSE

CLASSICAL AND NEW METHODS FOR PHYSICO-CHEMICAL AND MICROBIOLOGICAL CONTROL IN THE DAIRY INDUSTRY

05 March 2007 – 09 March 2007
LB BULGARICUM PLC - SOFIA

05 March 2007
Monday

9,00 – 10,00 REGISTRATION AND OPENING OF THE COURSE.

Lectures and exercise

10,00 Basic principles for safety in the chemical laboratory
17,00 Methods for sampling and physico-chemical analysis
Analyses of milk: Acidity, pH, fat content, dry matter, total
protein/casein, mineral content, lactose by Shoorl, lactose -
enzymatic method (Boehringer)

Lecturers: M. Spassova, G. Velichkova

06 March 2007
Tuesday

8,30 Physico-chemical analyses – control of the production - pasteurized
16.30 milk, fermented milk products, cream, cheese, dry
products (powdered milk and whey). Analysis of protein by
Kehldal.
Information on the methods for detection of the most frequent
adulterations of milk. Analysis of washing and disinfecting
preparations.

Lecturers: M. Spassova, V. Krasteva

07 March 2007
Wednesday

8,30 ч. Information on the safety principles in the microbiological
16,30 ч laboratory
Growth media, applied in the microbiological practice.
Rules for growth media preparation. Sterilization.
Preparation of samples for analysis. General rules for
microbiological analysis. Surface inoculation and calculation of
the number of colonies (CFU).
Inoculation of broth media and calculation of the number of bacteria
with the “most probable number” tables.
Microscope. General scheme. Determination of the surface of the visible area
with a micrometer. Calculating the factor of the microscope. Staining of

somatic cells. Enumeration technique. Determination of the number of somatic cells in raw milk according to BDS EN ISO 13366-1

Lecturers: Z. Nikolov, D. Doinova, T. Dimitrova

08 March 2007

Thursday

8,30 Technique for microscope slide preparation. Methods for staining;
16,30

- A. Staining with methylene blue.
- B. Staining acc. to Gram.

Contemporary methods for detection of inhibitors in milk.
Determination of the total bacterial counts - BDS ISO 6610;
Yeasts and moulds - ISO 6611; Coliforms - ISO 4832.
Information on the principles and techniques for analyses of samples and tests by parameters: Salmonella – BDS EN ISO 6579;
Escherichia coli- BDS EN ISO 16649 -2; Enterobacteria - ISO 21528-1;
staphylococci -ISO 5594.

Lecturers: Z. Nikolov, D. Doinova, T. Dimitrova

09 March 2007

Friday

8,00 Application of pure cultures for the production of dairy products..
16,00 Bacteriophages and methods for their detection. Measures against phage infections.

Lecturers: Z. Urshev, K. Pashova

16.00

16,30 Discussion on the contents of the course. Filling in a questionnaire.

Closing the course.

APPENDIX 4

PROGRAM OF THE COURSE ON

**“TECHNOLOGICAL REQUIREMENTS FOR IMPROVEMENT OF THE QUALITY OF BULGARIAN
YOGURT”**

**15 October 2007 – 20 October 2007
LB BUGARICUM PLC - SOFIA
RESEARCH AND DEVELOPMENT CENTER**

15 Oct 2007
Monday

9.15 – 17.15 . Registration and opening of the course.
Lectures: Microbiological control of raw
milk intended for the production of yogurt.
Control of the ready product.

Lecturer: Z. Nikolov

Lectures: Starters for Bulgarian yogurt and methods for their
application in the production process. Bacteriophages. Methods for
prevention of phage infection in yogurt production.

Lecturers: Z. Nikolov, K. Pashova, Z. Urshev

Lunch break 12.00 – 13 00

16 Oct.2007
Tuesday
9,30 – 17.00

Lecture: Physico-chemical analyses related to yogurt production.
Information on the methods for detection of the most frequent
adulterations of milk. Application of washing and disinfecting
preparations

Lecturer: M.Spasoova

Exercise: Microbiological methods for analysis of
raw materials and ready products

Zh. Atanassova, D. Doinova, T. Dimitrova

Exercise: Physico-chemical methods for analysis of
raw materials and ready products

M. Spassova; G. Velichkova,
V. Krasteva, K. Krasteva

Lunch Break 12.00 – 13 00.

17 Oct 2007
Wednesday

9.00 - 17.00 .

Lecture: Technological requirements for Bulgarian yogurt production.

Lecturer: prof. Zh. Simov

Lecture: Methods and equipment for control of the raw materials, hygiene of surfaces and water according to the requirements of HACCP. Safety of raw materials and ready products.

Lecturer: D. Trendafilova

Practical exercise: T. Bayatev, D. Nikolova,
T. Ivanova, Z. Nikolov

Lunch break: 12.00 – 13 00

18 Oct 2007
Thursday

9,00 – 16.30

Practical exercise:

T. Bayatev, D. Nikolova,
T. Ivanova, Z. Nikolov

Lunch break: 12.00 – 13 00

19 Oct 2007
Friday

8.30 -16.30

Practical exercise.

Performing sensory evaluation. Discussion on the contents of the course

Lunch break: 12.00 – 13 00

Practical exercise: T. Bayatev, D. Nikolova,
T. Ivanova, Z. Nikolov

NATIONAL VETERINARY MEDICINE SERVICE
DEPARTMENT
"CAPITAL VETERINARY SANITARY CONTROL "
 TESTING LABORATORY

SOFIA, 7 GENERAL DANAIL NIKOLAEV BLVD., TEL.: +359 2 843 24 51, FAX: +359 2 944 46 36

Check up for the quality of raw milk:

During 2002 year were tested 10 000 samples raw milk from 500 stations, mainly from NW Bulgaria. According statistical evaluation standard raw milk is 10%.

During 2004 year for determining quality of raw milk in Bulgaria were taken from official veterinary doctors samples from each station generally 10 000. During 3 months in the laboratory were tested 250 samples daily. The result is 30% standard milk.

These data are index that the quality of raw milk in Bulgaria going better.

THE QUALITY OF RAW MILK 2005

2005	TBC	Directive	Regulation	Out of standard	SCC	Directive	Regulation	Out of standard
12 months	4015	1616	919	1480	4010	1108	1084	1278
		40 %	23 %	37 %		41 %	27 %	32 %

THE QUALITY OF RAW MILK 2006

2006	TBC	Directive	Regulation	Out of standard	SCC	Directive	Regulation	Out of standard
12 months	4251	2764	873	614	4249	2787	487	975
		65%	20,5%	14,5%		65,6%	11,5%	22,9%

THE QUALITY OF RAW MILK 2007

2007	TBC	up to 100000	up to 500000	over 500000	SCC	up to 400000	up to 500000	over 500000
9 months	2842	1974	446	422	2708	2087	156	465

As a result of tests made in the reference laboratory was published Guide for testing of milk and milk products - 2003 year.

As a result of the project the laboratory was made as Reference for the country, with order of the minister of agriculture since 2003 year. The laboratory is the only one, which has these apparatus and has the ability to perform test result only for few hours.

2004 г. Promote of sector Raw Milk as a Reference laboratory ahead of European commission of community in Paris – presentation of a report.

In 2006 was taken a part in Interlaboratory trial.

In 2007 has taken a part in International interlaboratory trial, organized by AFFSA.

Qualitative and quantitative indices, by which are testing the samples of raw milk – total bacteria count, somatic cells counts, inhibitors, fat, protein, lactose, total solids content, freezing point.

Standards, used in the laboratory:

- Standard 100B:1991 - Milk and milk products - Enumeration of microorganisms. Colony count at 30°C
- Standard 148A:1995 - Milk - Enumeration of somatic cells
- BSS 6688 – Methods for detecting of inhibitory substances.
- Standard 117:2003 /ISO 7889 - Yoghurt - Enumeration of characteristic Microorganisms. Colony-count technique at 37° C.
- ISO 2446 - Milk. Determination of fat content. (Routine method).
- BSS 1111 - Milk and milk products. Determination of acidity.
- Standard 20-2:2001 /ISO 8968-2 - Milk - Determination of nitrogen content. Part 2: Block-digestion method (Macro method)
- BSS EN ISO 5764 – Milk - Determination of freezing point. Thermistor cryoscope method (Reference method).
- ISO 11816-1 - Milk and milk products - Determination of alkaline phosphatase activity - Part 1: Fluorimetric method for milk and milkbased drinks.
- BSS ISO 9622 - Whole milk. Determination of milk fat, protein and lactose content. Guidance on the operation of mild-infrared instruments.

- Standard 21B:1987 - Milk, cream & evaporated milk - Determination of total solids content.

Training of new workers in the laboratory.

As a reference laboratory, at the building of D CVSC, have been conducted a course for training of laboratory doctors, working in the RVMS from the country, about taking of samples of raw milk, preserving and transportation. There have been discussed and practically showed methods of testing raw milk by instruments.

As a reference laboratory we are trained our colleagues from the laboratories in the structure of NVMS and the other ones.

The training plan includes:

1. Physical chemistry.

- Determination of fat content by Gerber's method - ISO 2446.
- Determination of water and total solids contents - direct method of drying - IDF 21 B.
- Determination of acidity of milk - BSS 1111.
- Detecting of inhibitory substances - method of fermentation - BSS 6688
- Determination of density - BSS 1110.
- Determination of alkaline phosphatase activity - ISO 11816-1.
- Determination of freezing point - БДС ISO 5764.
- Determination of nitrogen content - IDF 20B.
- Training with MSC, FM, BSC - ISO 9622

2. Microbiology.

- Enumeration of microorganisms. Colony count technique at 30°C - IDF 100 B.
- Yoghurt - Enumeration of characteristic Microorganisms. Colony-count technique at 37°C - *L. bulgaricus*, *Str. thermophilus* - IDF - 117 A.
- Disc assay for determine of antibiotics in raw milk – Intralaboratory method.

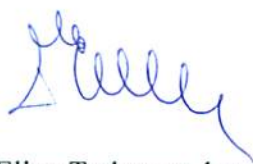
3. Statistic.

- Analyses of statistical data and determining of uncertainty.

Because of lack of other laboratory like this, amortization is huge and supporting of the used apparatuses is too expensive, that's why have the difficulties with the analyze for determining of percent of standard milk.

The funds, which are given for maintenance of the apparatuses are about 50 000 lv. per year.

Yours sincerely,



Dr. Elina Todorova, head of the laboratory



ANNEX 5

PDM(PROJECT DESIGN MATRIX)

Narrative Summary	Indicator	Means of Verification	Assumption
Overall Goal Development of fermented dairy products with internationally competitive quality in Bulgaria	1)The number of newly developed yoghurt products in Bulgaria 2)Raw milk quality control with EU standards.	1)Annual report of dairy sector in Bulgaria 2)National standards	Existence of appropriate legislations Dairy farmers and dairy processors understand the necessity of milk quality improvement The project agencies bear responsibilities of extending acquired technologies in Bulgaria
Project Purpose Improvement/Development of technologies for fermented dairy products and raw milk quality control at project sites	1)Accreditation of CIVSC by National Accreditation Service 2)The number of newly developed prototype yoghurt at LBB	1)Certificates 2)Research reports and publications of LBB	
Output 1)Present situation of raw milk quality control and inspection are identified. 2)Improved methods for raw milk quality control and inspection are disseminated 3)Characterization analyses on collected lactic acid bacteria are made. 4)New/improved starters are utilized 5)Technologies for yoghurt production are upgraded.	1)The number of field surveys 2)The number of seminars conducted by CIVSC 3)The number of analyses on lactic acid bacteria characterization 4)The number of newly utilized starters 5)The number of manuals on yoghurt production technologies.	1)Survey reports and annual bulletins of CIVSC 2)Proceedings of seminars 3)Entries of database 4)Research reports publications of LBB 5)Research reports and publications of LBB	
Activities 1)Survey and study on present situations of raw milk quality control inspection 2)Examination of methods for and awareness enhancement on the improvement of raw milk quality control and inspection 3)Characterization research and database construction on collected lactic acid bacteria 4)Development of technologies for starter production/utilization 5)Improvement/Development and standardization of technologies for yoghurt production	Input Japanese side (1)Long-term Experts a. Team Leader b. Project Coordinator c. Experts in the fields of: a)Raw Milk Quality Control b)Dairy Microbiology c)Dairy Processing (2)Short-term Experts (3)Counterparts Training in Japan (4)Provision of Machinery and Equipment (5)Dispatch of Survey Missions	Bulgarian side (1)Counterparts and administrative personnel a. Project Director b. Project Manager c. Counterpart personnel to the Japanese Experts d. Administrative personnel e. Other necessary supporting personnel (2)Land, buildings, facilities, and equipment a. Offices and facilities necessary for the Japanese b. Laboratories and attached facilities c. Other as required (3)Provision of running expenses of the Project	Support from related Ministries and Agencies are secured, even in the organization reform process. Pre-Condition A sufficient number of counterparts will be assigned to the Project. LB Bulgaricum PLC will not be privatized. CIVSC functions as information center in collecting necessary raw milk samples and data for the project. LBB collection of yoghurt bacteria is timely released for the characterization research. Sufficient budget is allocated for running expenses of the project.

LBB:LB Bulgaricum PLC, CIVSC:Capital Inspection for Veterinary and Sanitary Control

ANNEX 6 Evaluation Grid

CRITERIA	EVALUATION QUESTIONS		Achievement Criteria/Measures	Data needed	Data source	Data collection methods	Results
	Main questions	Sub questions					
IMPACT	What positive and negative impacts has the project achieved besides what was originally intended?	<p>Does the Project have a nationwide effect?</p> <p>Did the results of the project influence the consumption of dairy products in Bulgaria?</p> <p>Are there new products in the market as a result of the project?</p> <p>Are there new technologies implemented by the dairy producers?</p>	Side effects of the Project, influence on the dairy producers and farmers	Statistics, with which farmers and dairy producers do the counterparts work particularly.	Mmedia, Ministry of Agriculture and Foods,	Interviews,	<p>The Project had an unexpectedly good impact in terms of influence on the personal professional skills of the employees of CIVSC and LB Bulgaricum, according to the opinion of the participants of the Project.</p> <p>An important impact of the Project which was not originally particularly intended is the increase of the language knowledge of the CIVSC and LB Bulgaricum employees. In addition, the participation in the Project has led to significantly improved skills in preparation and accomplishment of projects. For instance as a result of a successful PHARE project two laboratories in Stara Zagora and Lovech were supplied with Milcoscan and Fossmotic apparatuses and people from the respective laboratories were trained to work with Bactoscan.</p>
	What unintended positive and negative effects have been observed?	<p>Has the overall quality of the milk and dairy products in Bulgaria been improved or worsened?</p> <p>Has the project contributed to the health status of the population?</p> <p>Do the counterparts act as functioning competence centers?</p>	Review of the recent developments of the Buglarian dairy industry, health of the population.	Statistics, amounts of milk and dairy products sold, health statistics	LB Bulgaricum and CIVSC, dairy producers.	Interviews, inspections on site	<p>The Project had an unexpectedly good impact in terms of influence on the personal professional skills of the employees of CIVSC and LB Bulgaricum, according to the opinion of the participants of the Project.</p> <p>An important impact of the Project which was not originally particularly intended is the increase of the language knowledge of the CIVSC and LB Bulgaricum employees. In addition, the participation in the Project has led to significantly improved skills in preparation and accomplishment of projects.</p>
	What factors contributed to the positive and negative effects?	<p>Are the economical and social developments in Bulgaria influencing the achievements of the Project?</p> <p>Are there particular governmental issues with influence on the achievement of the project?</p>	Social and economical development, new laws, implementation of governmental programs	Economical growth, growth of the dairy sector, particular governmental acts, etc.	Governmental statistics, data from the dairy sector	Interviews	The overall successful social and economic development of Bulgaria promoted the impact of the Project. Particularly, the entrance into EU intensified the efforts for improvement of the quality of dairy products and achievement of EU standards. Increased competition with Western companies stimulated Bulgarian dairy producers to look for technological and methodological help CIVSC and LB Bulgaricum. Many private dairy producers invested in improvement of production facilities and equipment for control analysis. There is an increasing interest in the implementation of upgraded technologies for yoghurt production and better starters. Therefore the Project exhibits a continuing impact by providing technology, modern analysis methods and starters. The increased need for high-quality raw milk makes the established control system, including feedback information flow to the farmers, particularly valuable.
	Among the positive changes made, how has the project implementation empowered the target group (dairy producers, farmers) technically, economically, socially and environmentally?	<p>Are the dairy producers continuously been supplied with technologies and starters?</p> <p>How many and which novel starters have been developed?</p> <p>How many and which starters are implemented in production?</p>	Implementation and distribution of technologies, development of new starters and products, provision of raw milk with better quality	Farmers and dairy producers using the skills and supplies of CIVSC and LB Bulgaricum, lists of products, starters and measurements for improving the quality of the raw	LB Bulgaricum R&D and production departments, CIVSC, dairy producers	Interviews, inspections on site, reports	New upgraded technologies for yoghurt production were implemented, high-quality starters developed and raw milk with

	Is the quality of the raw milk satisfactory for the dairy producers? Which farms are being supplied with technological help from CIVSC?		milk.			better quality provided, EU standards for raw milk quality control introduced.
Has the project contributed to an improved institutional capacity of the implemented agency?	Analysis of the results of the scientific research in the course of the project? What are the new production technologies developed and implemented? Are there new microorganisms been isolated, characterized and included in novel starters? Has the delivered equipment been use efficiently and adequate?	Report on the equipment in each delivered department and for what purpose it is used. Lists of novel technologies, starters, microorganisms, including characteristics and production applications.	Survey on the technological, equipment and scientific improvements	Reports, surveys, lists of equipment	Inspections on site, reports, interviews	Beside the above discussed overall beneficial effects of the Project on the professional capabilities and qualifications of the CIVSC and LB Bulgaricum personnel, the Project implementation has extended positive influence on the employees in terms of personal motivation, team-work and cooperativeness, as witnessed from the interviewed participants in the Project. The improved skills and knowledge allowed the personnel of LB Bulgaricum to apply for and profit from projects financially supported by the Bulgarian Small and Medium Enterprises Promotion Agency. As a result if the improved professional capabilities after the completion of the Project, three experts who had attended training in Japan, acquired positions at the Ministry of Agriculture and Foods. Both Counterpart institutions expend intensive labors in training new employees, increase of the professional qualifications of the personnel by organizing training courses and seminars. In addition similar activities are being undertaken for students from the University for Food technologies, Plovdiv, and food-technology specialized high-schools. As a result of the Project the importance of good language skills are recognized and the employees are encouraged to attend language courses.
Has the project contributed to the promotion of environmental and social developments? Has there been any influence on LB Bulgaricum, the citizens, other dairy producers and on CIVSC as a result of the implementation of the project?		Particular effects on the Bulgarian market of dairy products and overall effects on target groups (consumer's quality of food and life, dairy producers) and institutions (Associations of the dairy producers in Bulgaria, responsible and interested governmental institutions)	Economical, social, environmental data.	Target groups and institutions (consumers, dairy producers, associations of the dairy producers in Bulgaria).	Interviews, opinions from responsible personnel and target groups (dairy producers, active of the associations of the dairy producers), media survey.	Provision of high-quality raw milk has an impact on the health and quality of life of Bulgarian population since the consumption of dairy products is traditionally high in Bulgaria. The Project has an direct impact on the production of dairy product with traditional taste and qualities in Bulgaria. More strict regulations in accordance with EU policy and increased consumer's requirements and expectations with respect to the quality of the dairy products further supports the ongoing efficacy of the Project. Notably, the introduction and application of EU regulations (i.e. Natura 2000) regarding the environmental preservation and ecological policies are expected to protect Bulgarian national reservoirs for isolation of novel lactic acid bacteria (mountain regions and isolated forest areas with low population density) from industrial contamination which will promote the continuation of the efforts for isolation and characterization of new lactic acid isolates and development of starter cultures resulting from the Project implementation.
	Is there any positive or negative influence been observed by the society? Influence observed by the dairy producers? Influence on the excellence of LB Bulgaricum and CIVSC?	Economical, social, developmental impacts.	Influence on the quality of life, consumption of dairy products and their quality.	Media, LB Bulgaricum, dairy producers, CIVSC.	Interviews	
Has a reference been made to the terminal evaluation with regards to making a comparison	Were the recommendations of the terminal evaluation adequate and reasonable? Did the terminal evaluation	Specific examples and measures undertaken.	Influence of the undertaken measures and implementation of	LB Bulgaricum, CIVSC, dairy producers.	Interviews with responsible persons.	A reference to the terminal evaluation has been made with

	<p>between the expected impact at the time of terminal evaluation and the achieved impact? Are there any recommendations by the terminal study implemented and executed properly?</p>	<p>help for the impact of the project and how? What is the result of the implementation of the terminal evaluation recommendations, if there are any?</p>		<p>recommendations on the achievement of the overall goal of the project.</p>			<p>generally positive effect.</p>
	<p>Are there any external factors that have influenced the achievement of the project overall goal?</p>	<p>What is the influence of the overall economic and social development? Are there any particular governmental measures and social issues which have influenced the project goal?</p>	<p>Investigation of the recent economical and social developments.</p>	<p>Economical and social data.</p>	<p>Ministry of the Agriculture and Forestry, LB Bulgaricum, publications.</p>	<p>Interviews, media survey, statistics.</p>	<p>The impact of the Project was limited to some extent as a result of the increased competition on the market of dairy products and starter cultures. The introduction of dairy products on the market is difficult with respect to the low prices and the increased variety of imported dairy products. The amount of raw milk produced in Bulgaria are still not satisfactory, and a large part of it is produced by small family farms with restricted capabilities for further improvements of the hygienic conditions and fulfillment of strict sanitary regulations.</p>
	<p>To what extent has the project overall goal been achieved since the Project terminated?</p>	<p>What is the overall influence on the dairy industry in Bulgaria? Is the degree of the control and monitoring of the raw milk and dairy products improved?</p>	<p>Development of the dairy industry in Bulgaria and implementation of innovative approaches for control and production</p>	<p>Plants and products development, qualification of the personnel.</p>	<p>Dairy producers, LB Bulgaricum.</p>	<p>Interviews with dairy producers and personnel, visits on site.</p>	<p>The achievements of the Counterpart institutions for the period after 2002 are immediate result of the completion of the Project. The overall goal has been successfully achieved.</p>
<p>Is the competitiveness and variety of Bulgarian dairy products increased?</p>	<p>Are the products implemented during the project (3 types drinking and 3 types plain yoghurt) still successfully sold on the market?</p>	<p>Satisfaction of the customers interest</p>	<p>Amounts sold.</p>	<p>LB Bulgaricum Market department</p>	<p>Interviews with responsible persons, distributors</p>	<p>The overall quality of the dairy products in Bulgaria has been improved. Increased competition with Western companies stimulated Bulgarian dairy producers to look for technological and methodological help CIVSC and LB Bulgaricum. Many private dairy producers invested in improvement of production facilities and equipment for control analysis. There is an increasing interest in the implementation of upgraded technologies for yoghurt production and better starters. Therefore the Project exhibits a continuing impact by providing technology, modern analysis methods and starters. The increased need for high-quality raw milk makes the established control system, including feedback information flow to the farmers, particularly valuable.</p>	
	<p>Are there newly developed products, based on old or new starters implemented on the market?</p>	<p>Diversification of the products</p>	<p>Number of novel products, presence on the market</p>	<p>LB Bulgaricum production and Market departments</p>	<p>Interviews with responsible persons</p>		
	<p>What are the tendencies of Bulgarian export of dairy products?</p>	<p>Increase of the international competitiveness</p>	<p>Producers exporting dairy goods, dairy producers approved for exportation in EU</p>	<p>Bulgarian Ministry of Agriculture and Foods, selected dairy producers</p>	<p>Statistics of the Ministry, interviews with selected dairy producers</p>		
	<p>Do the results and achievements of the project still have a significant impact on the competitiveness and improved quality of dairy products in Bulgaria?</p>	<p>Implementation and distribution of novel starters, production manuals, seminars and technologies by LB Bulgaricum</p>	<p>An impartial assessment by the dairy producers</p>	<p>Dairy producers</p>	<p>Interviews</p>		
	<p>Has the quality of the raw milk in Bulgaria improved and does the project have a significant influence on this issue?</p>	<p>Sub-site CIVS functioning as a full value reference laboratory for the dairy industry</p>	<p>Control of the raw milk quality</p>	<p>CIVS records of the analysis results of the raw milk, opinions of the farmers and dairy producers</p>	<p>Inspection of the analysis performance in CIVS, interviews with dairy producers and farmers</p>		
	<p>Is CIVS distributing manuals, technologies and knowledge on</p>	<p>System for control and improvement of the quality</p>	<p>Improvement of the skills and</p>	<p>Opinions of the farmers</p>	<p>Interviews with dairy producers</p>		

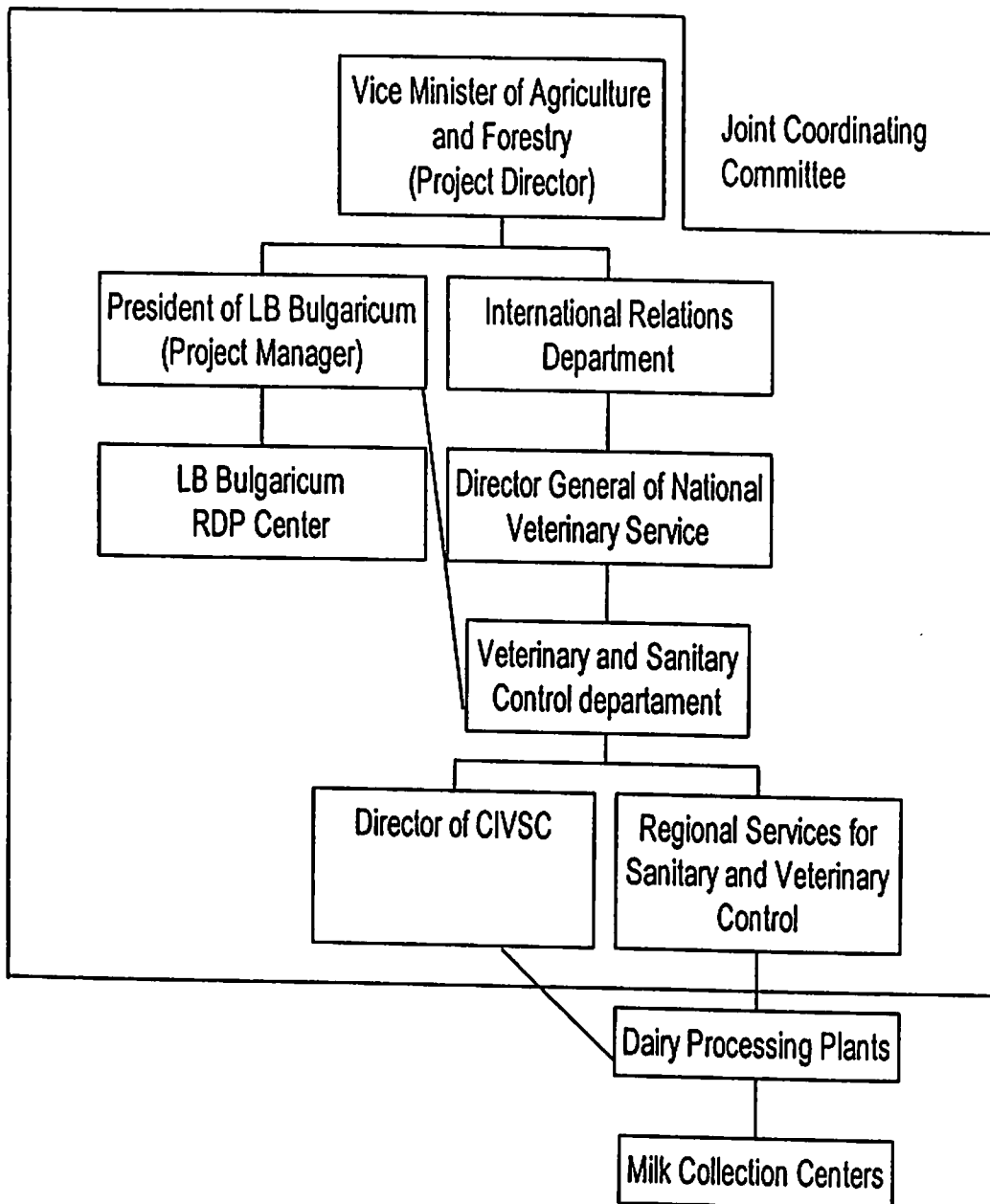
Does the project have influence on the quality of the raw milk in Bulgaria?	the proper collection and handling of the raw milk?	of the raw milk in the sub-site CIVS	knowledge of dairy producers and farmers	and dairy producers	and farmers	The overall quality of the quality of raw milk in Bulgaria is improved, although the amounts are not sufficient and additional governmental efforts are needed for promotion of the farmers.
	Is the communication between the sub-side CIVS and the farmers and producers improved?	Information from the producers and farmers to reach and be interpreted by CIVS and LB Bulgaricum	Coordination of the information and cooperativity	Responsible persons at the main- side and the sub-side	Interviews with responsible persons addressing the farmers and dairy producers	
	Is the technological capacity and competence of the CIVS enough improved to meet the EU standard for control of the raw milk?	Provision of competent control service nationwide	Number, skills, educational attainment and motivation of the CIVS employees; technical equipment	Employees of CIVS, opinion of dairy producers and farmers	Interviews, inspections of the laboratory facilities of CIVS	
	Does the overall social and economical development have influence on the quality of the raw milk?	Reflection of specific developments on the dairy branch	Produced raw milk annually, records on its quality, data reflecting the dynamic if social and economical activities in Bulgaria	State statistics, statistics of the Ministry of the Agriculture and Foods, analysis and conclusions on particular issues influencing the dairy sector	Interviews, media survey	
What is the particular influence of the project on LB Bulgaricum as a center of excellence for the dairy sector in Bulgaria?	Are there any novel starter cultures implemented in the dairy production?	Optimization and quality improvement of the dairy production process	Information about the state of development of new starters and new products thereof ? Literature survey	R&D and production employees in LB Bulgaricum R&D employees of LB Bulgaricum	Interviews, assessment of scientific reports Introduction to the publications, discussion with authors and contributors	The equipment delivered to LB Bulgaricum enabled expansion of its production list with products of higher quality, development and introduction of novel starters for dairy production, supply of private Bulgarian dairy producers with starter cultures. Since the equipment provided by the JICA Project is being used intensively, a minor obstacle for the technological sustainability of the Project is the fast and in time acquisition of spare parts.
	Are there new international scientific publications (incl. submitted or in print) as result of the project?	Improvement of the international scientific impact of Bulgarian lactic acid bacteria researchers				
	Did the project influence positively the employment policy and the motivation of the employees in LB Bulgaricum?	Attraction of qualified, motivated and ambitious co-workers in order to maintain and improve the research and production excellence	Dynamic of the employment, qualifications, educational and professional attainments	Human Resources department and/or responsible managers	Analysis of the employees policy based on the data from LB Bulgaricum, interviews for opinion with selected employees	
	Is LB Bulgaricum operating as a nationwide centre for distribution of production techniques and skills and provider of high-grade starters?	Positive influence on the overall quality status of the dairy products in Bulgaria via implementation and distribution of know-how	Survey on the starter cultures production list of LB Bulgaricum, technological manuals, seminars, willingness for support on-site	LB Bulgaricum production and market departments, dairy producers	Interviews with responsible persons in LB Bulgaricum, interviews and discussions with dairy producers and personnel of the Dairy Associations in Bulgaria	

SUSTAINABILITY

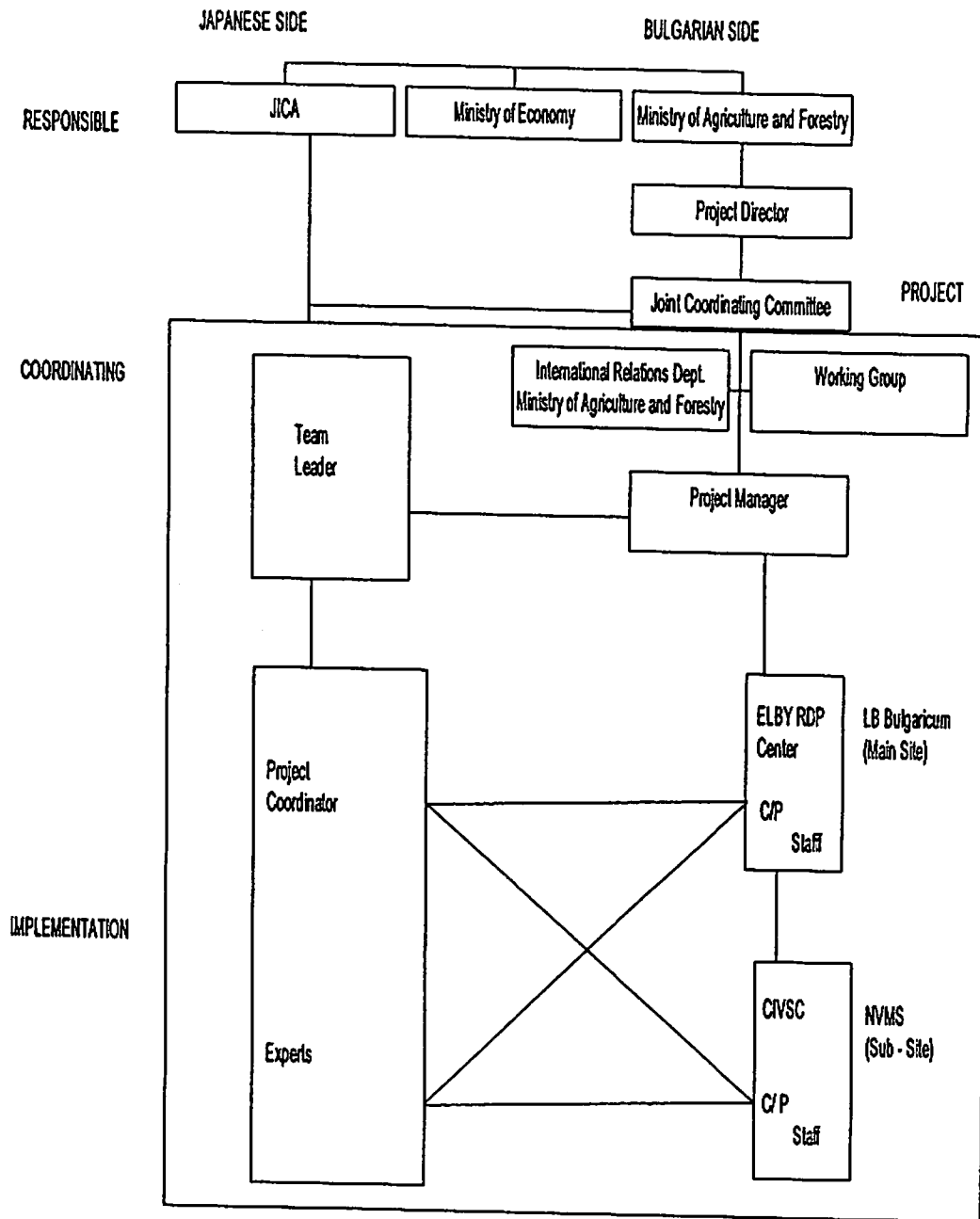
CRITERIA	EVALUATION QUESTIONS		Achievement Criteria/Measures	Data needed	Data source	Data collection methods	Results
	Main questions	Sub questions					
SUSTAINABILITY	Is the project counterpart organization maintain the achieved benefits as a result of reaching the project purpose and overall goals? And how is the counterpart organizations maintaining the project activities and services delivered by the project?	Has there been an ongoing government support for LB Bulgaricum and CIVSC? What has been the relations between the main site and the sub site after the project termination? Who is in charge of the progress on budget or activity execution? Who analyses the report? Has the structure allowed technical skills transfer to all staff and technical transfer to other sites?	Proper and qualified functioning of the established system in terms of techniques, finance and organization.	Verified data on the organization structure, financial sustainability, educational and professional attainment of the personnel.	LB Bulgaricum, dairy producers, CIVSC.	Observation on site, interviews.	<p>According to the MOE, the promotion of high technologies and food industry is a prior subject in Bulgaria in terms of the industrial development. In order to improve the milk and dairy products quality it is important to develop technologies of raw milk quality control. In 2007 Bulgaria became member of EU. In order to improve the milk quality, the Bulgarian government subsidizes the system for analysis and control of the raw milk introduced as a result of the implementation of the Project and has a plan to expand this system. An accurate milk analysis is an essential technique for implementing this plan. The technique for milk analysis, which CIVSC acquired, is expected to be fully utilized for the implementation of the national plan. The equipment is used properly and effectively. It has been actively utilized during the state-sponsored study of the quality of the raw milk in Bulgaria 2003 – 2004. The equipment delivered to LB Bulgaricum enabled expansion of its production list with products of higher quality, development and introduction of novel starters for dairy production, supply of private Bulgarian dairy producers with starter cultures. Since the equipment provided by the JICA Project is being used intensively.</p> <p>CIVSC is a state institution and LB Bulgaricum is state-owned company. Therefore both institutions are financially supported by Bulgarian government. Bulgarian government recognizes the importance of the dairy sector for the development of Bulgarian economy and takes measures for improvement of the quality of the dairy products. The traditional Bulgarian lactic acid bacteria and products thereof are considered as a precious resource of Bulgaria.</p> <p>The sales of upgraded dairy products of LB Bulgaricum provide the company with additional financial incomes. Nevertheless, the improved and stable economic situation in Bulgaria and the market invasion of foreign starter producers and dairy products hampers the successful realization of LB Bulgaricum products to some extent.</p> <p>Additional matter of concern is the prices for analysis of samples by CIVSC, which are fixed by a decree of Bulgarian government and therefore restricts the means for profit. This results in lack of flexibility for maintenance and repair of equipment acquired from the Project. We consider that further measures of the Bulgarian government are needed for support of both institutions, since their functioning is of crucial importance for the quality of the raw milk and dairy products in Bulgaria, as well as for the production of dairy products with traditional original taste and properties.</p>
	Is there a substantial governmental support, is the budget managed properly and competent?		Annual financial budget and competence of the responsible employees	Financial management	Financial department	Reports, interviews	
	Are the connections with the sub-side maintained and developed and how?		Information exchange and collaboration between the two institutions	Technological interchange share of information, synchronized measures and activities	Employees of both institutions, reports	Interviews, reports.	
	Are the competence and scientific technological skills continuing to improve?		Increase of the competency of the team	Personal opinions on the effect of the project	LB Bulgaricum team, Dairy producers. International collaborators	Interviews	
	Does LB Bulgaricum continuously support the dairy producers technologically?		Sustainable maintenance of the quality of the dairy products	Dairy production sector	Dairy producers	Interviews	
	Has the provided equipment been used efficiently?		Technical strengthening	Technical data	Technical and scientific employees.	Interviews, inspections on site	
	Is the overall attitude to collaboration between departments and team-work been improved?		Increased efficiency and productivity	Personal opinions.	LB Bulgaricum employees	Questionaries, inspection of the departments structure	
	What is the process of instructions flows between the different directorates and in what way does it affect the wholeness and implementation of the project? Who is in charge of personnel management? Has the provided equipment been used efficiently and		Evaluation of the technological aspects of the project implementation, and the organizational flexibility.	Information flow, qualification, motivation, willingness of the personnel to maintain the achieved level of technical and structural effectiveness.	Personnel of LB Bulgaricum, CIVSC.	Interviews, discussions.	

		maintained at high levels? Is there enough budget support reserve to support the above activity?					
	Is the project counterpart organization recognizing and maintaining the prospects of all sides of the project, including organizational, institutional, financial and technical stability, which are expected to be achieved after the terminal evaluation?	Is there a substantial governmental support, is the budget managed properly and competent?	Annual financial budget and competence of the responsible employees	Financial management	Financial department	Reports, interviews	The Counterparts recognize and maintain the expected prospects of all sides of the Project. There is obviously increased recognition for the importance of the Project with the time and acknowledgement for the its important positive effects.
Does the sub site CIVSC maintain and further develop the achievements?		Are the connections between the counterparts maintained and developed and how?	Information exchange and collaboration between the two institutions	Technological interchange share of information, synchronized measures and activities	Employees of both institutions, reports	Interviews, reports.	The sub-site (CIVSC) continues to disseminate the acquired analytical technologies on raw milk quality analysis to other institutions controlling raw milk quality, and contributes to strengthen the system for raw milk quality control, as a reference laboratory. This results in more effective institutionalization the system for raw milk quality analysis countrywide.
		Are the competence and scientific technological skills continuing to improve?	Increase of the competency of the team	Personal opinions on the effect of the project	CIVSC team, Dairy producers. International collaborators	Interviews	
		Does CIVSC maintain its capacity and facilities as a reference laboratory nationwide?	Provision of a nationwide control center	Analysis of the information collected as a result of the activity as a reference laboratory	CIVSC personnel and record, dairy producers, farmers	Interviews, analysis of the technological processes in the laboratory	
		Does CIVSC continuously supply the farmers and regional collection centers with technical support, manuals, instructions, regular seminars?	Provision of competence and technical help	Activities undertaken and maintained	Dairy producers, farmers, CIVSC employees	Interviews, reports.	
		Is the quality of the raw milk continuously improved as a result of the implemented control system?	Improved raw milk for the dairy industry and the consumers	Raw milk control parameters	Farmers, reports of CIVSC, dairy producers	Interviews, reports.	
		Are there any external factors that have influenced the achievement of the project overall goal? What are the factors that contribute /inhibit the sustainability of the project outcomes: such as appropriateness of project planning, technology transfer, and the role of external factors?	Evaluation of the factors influencing the project realization and their effects.	Organizational, social, economical and environmental aspects of the influence.	Ministry of Agriculture and Foods, LB Bulgaricum, CIVSC, dairy producers.	Interviews.	

ORGANIZATION CHART OF THE PROJECT



ORGANIZATION CHART OF THE PROJECT



Third Party Review by External Experts

Ex-Post Evaluation on the Fermented Dairy Products Development Project in the Republic Bulgaria

- * This Third Party Review by External Experts is to examine the end-product (an evaluation report and a summary sheet) of ex-post evaluation of the above-mentioned project in light of its structure, verification procedure and overall consistency. It is to be noted that the review is not to question the validity of the evaluation results per se.
- * On the leftmost column of each item, choose the rating from A as 'excellent', B as 'good', C as 'acceptable' and D as 'unacceptable'.
- * When you choose D for an item, specify the reason in comment fields.
- * For more details of viewpoints for each item, refer to the corresponding page of 'JICA Project Evaluation Guideline' which is indicated on the rightmost column of each item.

1 Evaluation Framework

Reference page No.
of 'JICA Project
Evaluation Guideline'

B	(1) Time Frame of Evaluation Study	97
Viewpoint	Necessary field survey activities such as data collection and discussion with counterparts are appropriately set within the time frame of the evaluation study. Time frame also contains preparations such as distribution of questionnaires, and are appropriate in terms of timing, length and schedule of the evaluation study.	
B	(2) Study Team	107
Viewpoint	Team members are assigned on a impartial basis, and are with balanced specialty.	
Comment		

2 Date Collection and Analysis

B	(1) Evaluation Questions	51
Viewpoint	Evaluation questions are in line with evaluation purposes and set properly in the evaluation grid. General questions as to the five evaluation criteria are narrowed down to more specific sub questions to identify necessary information/data to be collected.	
B	(2) Data Collection	72
Viewpoint	Data collection is conducted based on the evaluation grid, and is sufficient for obtaining answers for evaluation questions. Additional information are collected for unexpected and newly confronted questions during the process.	
B	(3) Measurement of Results	61
Viewpoint	Achievement level of overall goal is examined on the basis of appropriate indicators, being compared with targets.	
B	(4) Examination of Causal Relationship	62
Viewpoint	The causal relationships whether the effects for the beneficiaries resulted from the project is examined either in a qualitative or quantitative manner (i.e. Are the effects at the overall goal level caused by the project intervention?)	
Comment		

3 Evaluation Results

B	(1) Impact	57, 85-86
Viewpoint	Perspectives for evaluation of 'Impact' (e.g. achievement level of the overall goal, causal relationships between the outcome of the project and overall goal, ripple effects) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	
B	(2) Sustainability	58, 85-86
Viewpoint	Perspective for evaluation of 'Sustainability' (e.g. probability of activities to be continued and outcomes to be produced in terms of 1)policies and systems, 2) organizational and financial aspects, 3) technical aspects, 4) Society, Culture and environment and) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	

B	(3) Factors Promoting Sustainability and Impact	85-86
Viewpoint	Promoting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	
B	(4) Factors Inhibiting Sustainability and Impact	85-86
Viewpoint	Inhibiting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	
B	(5) Recommendations	87-88
Viewpoint	Recommendations are made thoroughly based on the information obtained through the process of data analysis and interpretation. Recommendations are specific and useful for feedbacks and follow-ups, preferably being prioritized with a time frame.	
B	(6) Lessons Learned	87-88
Viewpoint	Lessons learned are derived thoroughly based on the information obtained through the process of data analysis and interpretation. Lessons learned are convincing and useful for feedbacks, being generalized for wider applicability.	
Comment		

4 Structure of Report

B	(1) Writing Manner	89,103
Viewpoint	Logical structure and major points are clearly described in an easily understandable manner.	
B	(2) Presentation of Primary Data and Utilization of Figures	89,103
Viewpoint	Sufficient primary data such as on the target, contents and results of interviews and questionnaires are presented properly in the report. Figures and tables are utilized effectively to present statistics and analysis results.	
Comment		

5 Overall Review based on 'Criteria for Good Evaluation'

B	(1) Usefulness	13-14
Viewpoint	In light of the effective feedback to the decision-making of the organization, clear and useful evaluation results are obtained.	
B	(2) Impartiality and Independence	13-14
Viewpoint	Evaluation is impartially conducted in a neutral setting	
B	(3) Credibility	13-14
Viewpoint	In light of the specialties of evaluators, transparency of the evaluation process and appropriateness of the criterion of judgment, evaluation information are credible.	
B	(4) Participation of Partner Countries	13-14
Viewpoint	Partner countries' stakeholders participate actively in the process of evaluation, not just provide information.	
Comment		

6. Overall Comment

The finalized reports are on a good level and provide a rigorous enough review in terms of indicators of sustainability, financing, policy and agenda.

Date: 29.01.2008

Name of the Third Party: Radka Vlaseva

Designation: Assoc. Professor

Name of the Institution : University of Food Technologies, Plovdiv, Bulgaria

Overall Comments of Third Party Review on the Ex-Post Evaluation on the Fermented Dairy Products Development Project in the Republic Bulgaria

The consultant has conducted a good evaluation, conforming to the *Project Design Matrix of Terminal Evaluation* and the *Evaluation Grid*.

The finalized reports have taken into account the proposals and recommendations and this has led to prolonged impact of project results and sustainability of its influence.

As a third-party reviewer, I am satisfied with the finalized reports, namely the Evaluation and Review Reports of the above-named project.

Date: 29.01.2008

Name of the Third Party: Radka Vlaseva

Designation: Assoc. Professor

Name of the Institution : University of Food Technologies, Plovdiv. Bulgaria