MICROBIAL RENNET for Cheese Production



Susana M. Mercado Project Leader







BIOTECH Microbial Rennet

- an effective milk coagulant produced by solid substrate fermentation using the fungus Rhizopus chinensis BIOTECH 3273
- developed by the National Institute of Molecular Biology and Biotechnology (BIOTECH) through funding from DOST and DA-BIOTECH.
- The product is a better substitute for traditionally produced animal rennet.
- It has been found to be better than imported rennet in terms of quality and volume of cheese produced





Year	Net Weight (kg)	Trade Value (US\$)
2007	52,920.00	476,268.00
2008	33,681.00	369,758.00
2009	49,496.00	947,640.00
2010	45,365.67	868,752.52

Source: Based on United Nations Commodity Trade

Statistics Database, 2007-2010

- Extract from animal abomasum
 - Rennet from milk fed calf

>Chymosin or rennin - 95%

>Pepsin - 5%

Rennet from older cows, sheep, carabao, etc

>Chymosin – 5%

>Pepsin – 95%

- Imported rennet
- Acid





BIOTECH RENNET

Product	Liquid	Granule
Activity	60 IMCU	100 IMCU
Application rate	10 ml/L milk	5 grams/L milk
Price	PhP 480/L	PhP 750/Kg
Shelflife	5 months	1 year
Present Production	60 L/mo	30Kg/mo





- Projected annual demand: 43 tons
- PCIEERD project: Scale up target production is 20% of the total demand
- Technology adaptors/taker: PCC & Aust Phil Foods







Milk coagulant being used by local dairy processors and multinational companies compared to BIOTECH microbial rennet

	Cost of coagulant per 100 L milk	% Cheese Yield	Production Cost of Cheese/100 grams	Net benefit /100L milk
Animal Rennet*	700.00	18	20.53	5,305.00
Chymax**	56.00	18	16.95	5,949.00
Vinegar***	250.00	10	32.86	1,714.38
BIOTECH rennet Granules	350.00	23	14.54	8,155.00
BIOTECH Liquid rennet	480.00	23	15.11	8,025.00

^{*}Rennet extracted from 4th stomach of ruminant (PhP 70/L)

^{**}Commercial rennet produced by Pizer and distributed by Christian Hansen, recombinant rennet, (PhP 21,000 per Kilogram, 2080 IMCU/gram)



Market



The market for microbial rennet is attractive because there is still no local producer or dominant distributor serving the small to medium cheese manufacturers.

Positioning: The "best quality and most efficient cheese coagulant" in the market.

Price: P 480.00 per liter and P 750.00 per Kg – similar price as the imported rennet to emphasize the best product image, better quality of the product and its efficiency as cheese coagulant.





LOCATION MAP OF BIOTECH RENNET CLIENTS MR. ANNETE PATDU Ms. OLIVIA RESIDE A-Farm Baguio City Sta. Barbara, Tarlac Ms. JOAN PERALTA Aust Phil Food Mr. Jason Gavino 5th District of Pangasinan Dairy Manufacturing Corp. Nueva Ecija farm, Laoac, Pangasinan #180 10th Street corner 8th Avenue. Grace Park Caloocan City MR. EMMERSON MANANGHAYA Ms. Socille Caindec Lin-Mer's Bakeshop Quezon City Tibag, Baliwag, Bulacan Mr. YNIGO GENIZA MR. LESTER S. ORQUE 3 Fontaine Extension, East Tapinac 129 Caimito Street. Olongapo City, Zambales Cembo, Makati City MR. NORMAN MERCADO Ms. JANE CAJUGURAN Bagumbayan Dairy D64B Villa Regina F. Antonio St. Bagumbayan, Sta. Cruz, Bambang, Pasig City MR. RICO DIAZ Laguna Cabuyao, Laguna MR. WALFRIDO DE JESUS, JR. San Jose Street, Molo. Iloilo City MR. MARC NACIANCENO MR. OLIVER JOHN GOMEZ Julio Treinta 31 Food & Beverages Enterprise Putho, Los Baños, 4 Garcia Apt., PHHC B-22 L-29 Laguna Manduriacy Bollo City WAFFLE TIME, INC. Ms. JULIE TAN Dotlo Visayas State University Baybay, Leyte PURO ORGANIC Ms. JAQUES DAGUERRE Triple i Cheese Sitio Aning, Barangay Pahanocov, Bacolod City, 3 Purok Bucac, Bayugan, Negros Occidental Agusan Del Sur Ms. SYLVIA AGUROR Xavier University, Cagayan De Oro

Profitability Analysis

	Liquid Concentrate	Rennet Granules
Net Present Value (15% discount		
rate)	1,624,560.92	1,534,580.72
Total Investment	1,702,825.79	4,492,624.72
Selling Price	480.00/ Li	750.00/ kg
Break-even point	8,770.84 Li	11,845.88, kg
Profit margin	194.15/Li	379.26/kg
Break-even period (in year)	1.5 years	1.5 years
Average net income/year	1,072,168.85	1,916,675.97
Average return of		
Investment/year (%)	62.96	42.66





Example of Opportunity sites















