

CURD-MAKING FROM CARABAO MILK INTENDED AS RAW MATERIAL FOR PROCESSED CHEESE MANUFACTURE

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ABSTRACT

A process evolved from a study where carabao milk in distant villages can be preserved for a longer period by converting them into curd intended as raw material for processed cheese manufacture. Curd made from raw milk can be kept from 2-3 weeks at ambient temperature with the development of stronger flavor and aroma from day to day as compared with the pasteurized lot. Curd produced daily over a three-week period was pooled together to constitute one batch. Organoleptic grading done by a selected panel labelled the product acceptable until after three weeks.

INTRODUCTION

Curd making suitably applies in distant places where collection of liquid milk is not economically feasible due to low density of production. A curd collection program assures the farmers a profitable utilization of their milk and therefore serve as incentive to promote small dairying in the countryside. A process of curd making utilizing cow's milk was reported to keep about a week at room temperature without deterioration in flavor (Stobber-up, 1977). The process does not require sophisticated equipment and even very small volume of milk can be utilized for curd making.

Carabaos milk have greater utilization potential than milk of any other domestic animals due to its higher fat and protein contents (Davide, 1975) making them suitable for the manufacture of cheese and confectioneries. Although used mainly as draft animals, it is worthwhile to entice our small farmers to milk their animals for their own use and part of the produce sold to generate an extra income. A limitation, however, for them to continue milking is the lack or absence of liquid milk market especially those in far flung areas where a collection scheme does not operate. It is for this reason that farmer's milk in distant places were utilized for this study.

Murphy (1965) reported a process whereby extended curing of the curd is not required yet the product exhibited uniform flavor and body characteristics particularly suited as raw material for processed cheese manufacture. Normally, the natural types of cheese require from three months to one year ripening period.

Processed cheese was originally invented as a method to prolong the keeping quality of good quality cheese. But recently, the process includes

	2-26-79	9-10-79	1-8-80
V F			
	C-7	# 6	# 6
	H-20	# 7	#16
	# 10	#101	# 4
	# 9	H-206	# 20
	+++ (P)	+++ (P)	+++ (P)
	+++ (S)	+++ (S)	+++ (S)
	+++ (P)	+++ (S)	+++ (P)
	+++ (N)	+++ (N)	+++ (P)
	3-26	10-15-79	1-8-80
V I F			
	RS-32	YB-112	# 21
	CM-8	B-9	YB-2
	# 22	# 103	H-21
	# 8	# 18	B-92
	+++ (S)	+++ (S)	+++ (P)
	+++ (P)	+++ (S)	+++ (P)
	+++ (S)	+++ (P)	+++ (N)
	+++ (P)	+++ (P)	+++ (P)
	5-7-79	11-12-79	1-10-80
V I I F			
	B-1	B-203	H-325
	B-10	B-119	B-16
	# 11	H-206	B-182
	# 6	H-95	# 5
	+++ (S)	+++ (S)	+++ (S)
	+++ (N)	+++ (N)	+++ (S)
	+++ (P)	+++ (P)	+++ (S)
	+++ (P)	+++ (N)	+++ (S)
	+++ (P)	+++ (N)	+++ (N)
	7-6-79	11-20-79	1-10-80
V I I I F			
	H-15	YB-10	YB-14
	C-17	C-9	YB-42
	YB-16	# 2	# 1
	# 2	# 5	# 4
	+++ (S)	+++ (S)	+++ (P)
	+++ (N)	+++ (N)	+++ (P)
	+++ (P)	+++ (P)	+++ (P)
	+++ (S)	+++ (S)	+++ (S)
	8-8-79	11-26-79	1-10-80
I X F			
	C-107	# 9	# 11
	Y-635	# 1	# 23
	C-03	#20	# 35
	H-201	# 3	# 40
	+++ (P)	+++ (P)	+++ (S)
	+++ (N)	+++ (N)	+++ (S)
	+++ (S)	+++ (S)	+++ (S)
	+++ (N)	+++ (N)	+++ (P)

Legend: **Agglutination reactions in dilutions 1:25, 1:50, 1:100, 1:200

() Interpretation of agglutination reactions : P = Positive, S = Suspicious, N = Negative

Table 3. Comparative agglutination and keeping quality tests of the local *B. abortus* field antigen with plate antigen.

LOT NO.	AGGLUTINATION REACTIONS**											
	INITIAL TEST				SECOND TEST				THIRD TEST			
	SAMPLE NUMBER	FIELD ANTIGEN	PLATE ANTIGEN	SAMPLE NUMBER	FIELD ANTIGEN	PLATE ANTIGEN	SAMPLE NUMBER	FIELD ANTIGEN	PLATE ANTIGEN	SAMPLE NUMBER	FIELD ANTIGEN	PLATE ANTIGEN
I F		8-27-78		6-29-79			12-5-79					
	C-03	+++ (P)	+++ (P)	C-32	+++ (N)	+++ (N)	# 8	+++ (S)	+++ (S)			+++ (S)
	YB-635	+++ (S)	+++ (S)	# 1	+++ (S)	+++ (S)	# 10	+++ (S)	+++ (S)			+++ (S)
	# 5	+++ (S)	+++ (S)	# 11	+++ (P)	+++ (P)	YB-635	+++ (P)	+++ (P)			+++ (P)
	# 2	+++ (P)	+++ (P)	C-85	+++ (S)	+++ (S)	# 3	+++ (S)	+++ (S)			+++ (S)
II F		9-19-78		4-3-79			12-18-79					
	CM-21	+++ (N)	+++ (N)	# 2	+++ (P)	+++ (P)	B-570	+++ (N)	+++ (N)			+++ (N)
	C-32	+++ (P)	+++ (P)	# 13	+++ (N)	+++ (N)	H-121	+++ (S)	+++ (S)			+++ (S)
	C-78	+++ (P)	+++ (P)	C-78	+++ (P)	+++ (P)	# 12	+++ (P)	+++ (P)			+++ (P)
	H-35	+++ (S)	+++ (S)	H-35	+++ (S)	+++ (S)	# 4	+++ (S)	+++ (S)			+++ (S)
III F		12-12-78		7-6-79			12-20-79					
	H-40	+++ (N)	+++ (N)	B-2	+++ (P)	+++ (P)	C-21	+++ (P)	+++ (P)			+++ (P)
	C-12	+++ (S)	+++ (S)	C-22	+++ (S)	+++ (S)	C-12	+++ (S)	+++ (S)			+++ (S)
	# 6	+++ (N)	3 3-- (N)	# 7	+++ (P)	+++ (P)	# 20	+++ (S)	+++ (S)			+++ (S)
	# 16	+++ (P)	+++ (P)	# 10	+++ (N)	+++ (N)	# 6	+++ (N)	+++ (N)			+++ (N)
IV F		1-19-79		8-24-79			1-4-80					
	C-41	+++ (S)	+++ (S)	C-107	+++ (S)	+++ (S)	C-101	+++ (S)	+++ (S)			+++ (S)
	H-6	+++ (P)	+++ (P)	Y-635	+++ (P)	+++ (P)	# 20	+++ (P)	+++ (P)			+++ (P)
	YB-10	+++ (N)	+++ (N)	C-05	+++ (S)	+++ (S)	YB-219	+++ (S)	+++ (S)			+++ (S)
	YB-13	+++ (S)	+++ (S)	H-201	+++ (S)	+++ (S)	# 12	+++ (P)	+++ (P)			+++ (P)

IV T	1-22-79				10-9-79				1-5-80				
	2-23-79	10-9-79	11-6-79	3-21-79	2-23-79	10-9-79	11-6-79	3-21-79	1-5-80	10-9-79	11-6-79	3-21-79	1-5-80
C-936	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-226	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
H-40	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-22	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)
	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)
	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)
V T	2-23-79				10-9-79				1-5-80				
H-40	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-936	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-226	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-25	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)
	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)	(S*)
	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)	(N*)
VI T	3-21-79				11-6-79				1-5-80				
C-78	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-22	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
# 11	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
C-720	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)
	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)	(P)

Legend: ** Agglutination reactions in dilutions 1:25, 1:50, 1:100, 1:200

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