قسم : علوم وتكنولوجيا الأغذية - كلية الزراعة - جامعة أسيوط .
رئيس القسم : أ.د / ابراهيم أبوالنجا .

بعض صفات الجبن الأبيض المصنع من لبن مصاب بالتهاب الضرع

حسين عبد الجليل

صنع الجبن الأبيض من لبن جاموسى سليم وآخر مخلوط بلبن مصاب بالتهاب الضرع بنسبة ١٠ ، ٢٠٪ وخزن لمدة ٣٠ يوم على درجة حرارة الغرفة وتم تحليل الجبن الطازج وعلى عمر تخزين ١٥ ، ٣٠ يوم . ووجد أن الجبن الناتج من لبن ١٠٪ اصابة كان ضعيف الجودة ولكن يمكن قبوله للاستهلاك .

ولكن استعمال لبن به ٢٠٪ لبن مصاب ادى الى اطالة مدة التجبن وأعطى جبن ذو قوام طرى ومفتوح وتركيب مطاط وقد قصف وبه فتحات ميكانيكية بالاضافة الى وضوح الطعم المالح والطعم المر أثناء وبعد التذوق .

وبتحليل الجبن اتضح أن زيادة اللبن المصاب أعطى جبن به نسبة رطوبة أعلى ومواد صلبة كلية أقل من الجبن المصنع من لبن سليم .

وعليه لا ينصح باستعمال لبن به اصابة أعلى من ١٠٪ فى صناعة الجبن الأبيض .

Dept. of Food Science and Technology,
Faculty of Agriculture, Assiut University,
Head of Dept. Prof. Dr. I. G. Abo-Elnaga.

SOME PROPERTIES OF WHITE CHEESE MADE FROM MILK OF BUFFALOES SUFFERING FROM MASTITIS

(With 2 Tables)

By

H. ABDEL-GALIL

(Received at 14/12/1980)

SUMMARY

Buffaloes milk containing 10 and 20% mastitic milk was converted into white cheese. At 10% the cheese was poor in quality but could be accepted for consumption. The higher percentage of mastitic milk not only lengthened the coagulation time but also gave a soft open cheese with mechanical holes and rubbery breakable texture. A salty and bitter flavour could be distinguished during and after tasting. The moisture content was higher and the total solids was lower than those of cheese made from normal milk.

INTRODUCTION

It is a well known fact that milk for use in cheese manufacture should be of a good quality and drawn from dairy animals not suffering from mastitis.

In a previous work the effect of mastitis on the chemical composition and curd properties of buffaloe's milk has been studied (ABDEL-GALIL and NASSIB 1980). The results obtained showed that mastitic milk was slightly lower in the fat and magnesium content than normal milk. S.N.F., casein, lactose, calcium and phosphorus content were markedly decreased, whereas whey proteins and chlorine significantly increased. The coagulation time was longer and the curd tension was lesser than normal milk. Mixing normal milk with mastitic milk, regularly increased the chlorine content and the coagulation time, and decreased the curd tension. A percentage of mastitic milk higher than 10% not only lengthened the coagulation time but also resulted in a weak curd.

The present work deals with some properties of white cheese made from normal milk containing 10 and 20% mastitic milk.

MATERIALS AND METHODS

Buffaloe's milk used in these experiments was both normal bulk milk and mastitic milk from infected quarters, secured from a private farm in Assiut vicinity. The mastitic samples were taken from subclinical mastitis cases (showed positive C M T reactions), the bacteria which isolated were Str. agalactiae and Staph. aureus.

The percentage of fat, S.N.F. and T.S. and the amount of chlorine and calcium (mg/100 ml) determined by the methods described by Ling (1963) were 6.30, 9.85, 16.25, 68.15 and 185.71 for normal milk. For mastitic milk the values were 6.21, 9.57, 15.78, 153.18 and 156.06, respectively.

The normal milk was mixed with 10 and 20% mastitic milk and used for white cheese making. After salting with 7% (w/w) cooking salt and warming in a water-bath up to 35 °C sufficient fresh solution of Hansens rennet powder was added to coagulate normal milk within 3 hours. The curd was laddled into metalic moulds, drained for 24 hours and the cheese was then pickled at room temperature.

The moisture determined by B. S. I. method (1952), T.S., body, texture and flavour were recorded for fresh cheese and after 15 and 30 day storage.

RESULTS AND DISCUSSION

Table 1 shows the effect of added mastitic milk on the coagulation time of milk and moisture content of cheese.

The results show that the coagulation time increased from 3 hrs. to 4.5 and 6.5 hrs. with addition of 10 and 20% mastitic milk, respectively. This may be due to the low calcium and casein content of mastitic milk compared to normal milk (NANI and REDAELLI 1957, HOSOYA et al. 1966 and KISZA et al. 1967).

The moisture content of cheese increased as the amount of added mastitic milk was increased. Negative results was obtained in respect to the total solids. After one-month storage the loss of moisture were higher in mastitic milk cheese than in that made from normal milk. The reduction in the moisture content was 14.84, 20.15 and 23.91% in normal milk cheese, in + 10% and in + 20% mastitic milk cheese, respectively. The yield of normal milk cheese showed consequantly a reduction of 19.01% compared to 23.66 and 27.29% in case of the two ratios of mastitic milk.

Table 2 shows the sensory evaluation of one-month-old cheese made from milk containing 10 and 20% mastitic milk. Cheese made from milk containing 10% mastitic milk was slightly soft and closed, slightly rubbery and breakable and had a slightly salty flavour .

The higher percentage of mastitic milk not only lengthened the coagulation time but also produced a soft open cheese with mechanical holes and rubbery breakable texture. A salty and bitter flavour like that observed by SOROKINA (1964) could be distinguished during and after tasting. The cheese was therefore not acceptable for consumption. These results agree with PERDRIX & PAOLI (1955) who reported that mastitis was a real danger to the quality of Gruyere cheese. SOROKINA (1964) also obtained a low quality cheese from mastitic milk.

Table (1)

The effect of added mastitic milk on the coagulation time of milk and moisture content of white cheese.

	Normal milk	+ 10% mastitic milk	+ 20% mastitic milk
Coagulation time (hours)	3.0	4.5	6.5
Cheese, Fresh:			
Moisture%	63.20	68.53	79.05
T. S. %	36.80	31.47	20.95
Yield %	32.35	35.42	42.18
15 days-old			
Moisture%	52.20	55.61	65.87
T. S. %	47.80	44.39	34.13
Yield %	25.56	27.62	32.26
30 days-old			
Moisture%	53.82	54.72	60.15
T. S. %	46.18	45.28	39.85
Yield %	26.20	27.04	30.67

Table (2)

Sensory evaluation of one-month-old cheese made from milk containing 10 and 20% mastitic milk

	+ 10% mastitic milk	+ 20% mastitic milk
Body:	slightly soft, closed	soft, open, with mechanical holes
Texture:	slightly rubbery and breakable	rubbery and breakable.
Flavour:	slightly salty	salty, bitter during and after tasting.

The salty taste observed here may be due to the lower lactose and higher chlorine content of mastitic milk than normal milk (BARRY & ROWLAND 1953, PILIPOVITCH et al.1956, GILLES 1966, and WALSH & NEAVE 1968).

REFERENCES

Abdel-Galil, H. & Nassib, T.A. (1980): Mastitic milk and its effect on white cheese manfacture. Assiut Vet. Med. J. 7: 13&14.

B.S.I. (1955): British Standard Institution, publication No. 696, Part 2.

Barry, J.M. & Rowland, S.J. (1953): Variations in the ionic and lactose concentratuon of milk. Biochem. J. 54: 575 - 78.

Filipovitch, Dj & Filipovitch, Darinka (1956): The chlorine content of milk and its value in the diagnosis of bovine mastitis and of pathological milk. Lait. 36 (359/360) 608 - 13.

Gilles, R. (1966): Na and K levels in milk of cows with mastitis. Ec. National Vet. Lyon. 38 : 50.

Hosoya, H.; Kuwabara, Y.; Igorashi, Y. & Kugoh, T. (1966): Changes of nitrogen distribution in mastitis milk. J. Fd. hyg. Soc. Japan. 7: 349 - 53.

Kisza, J.; Kruk, A. & Rotkiewicz, W. (1967): Renneting capacity of mastitis milk. Milchwissenschaft, 22: 558-62.

Ling, E.R. (1963): A text book of Dairy Chemistry, Vol. 2 London : Chapman and Hall.

Nani, S. & Redaelli, G. (1957): Behaviour of chemical constituents of milk in the course of bovine mastitis caused by Streptococcus agalactiae. Note III - The protein. Atti Soc. Ital. Sci. Vet. 11: 799-801.

Perdrix, J. & Paoli, C. (1955): Mastitis and abnormal milks in cheese - making. Bull. Soc. Sci. Vet. Lyon. 57: 49 - 55.

Sorokina, O.F. (1964): Effect on cheese quality of milk from cows with subclinical mastitis. Izv. Vyssh. Ucheb. Zaved., Pishch. Tekhnd. 4: 29 - 30.

Walsh, J.P. & Neave, F.K. (1968): Udder infection and the chemical composition of milk in eight dairy herds. Ir. J. Agric. Res. 7: 81 - 91.