

Effects of Some Environmental Parameters on Keeping Quality of Goat, Sheep and Cow Milks Obtained from Behbahan Animal Husbandry in Iran

Ali Aberoumand

Department of Fisheries, Behbahan High Educational Complex,
Behbahan, Khuzestan Province, Iran

Abstract: In this research, goat, sheep and cow milks were collected from a Behbahan animal husbandry in Iran, then cooled milk were transferred to nutrition laboratory. The samples of goat, sheep and cow milks were holden at the different time periods of 9.5 h (in oven), 59 h (in refrigerator) and 25°C at room temperature for 20 h, respectively and then with adding of organic acid time (sec) of reach clot-on boiling were measured for all samples. Results showed that different meaning of sheep milk and cow milks which had been holden at 36°C for 20 h and in room temperature after first boiling and also samples of cow milk and goat milk which had been holden for 59 h at 4°C 1 mm of organic acid were added and then were compared together. Results showed sheep, goat and cow milks were spoiled in effect of temperature changes and also in holding different timely periods.

Key words: Temperature, keeping quality, goat, cow, sheep milks, husbandry

INTRODUCTION

Milk production has increased with technology improvement and breeding correct feeding of animal in world and also in Iran. The most important countries of cow milk producer are the first Europe then Russia and northern America, especially, France and Germany which are the main countries. Milk production value has been calculated according to animals statistics and function mean in Iran. Milk production value according to 1000 ton including cow milk (2240), sheep milk (735), goat milk (267) and buffalo milk (38) in Iran. Per head consumption in Iran (Greig and Manning, 1983; Kitchen, 1991). Bulk collection of milk in Britain become universal in 1970, so that all milk now arrives at distributors and manufacturers in per misses at 5°C (Szijarto *et al.*, 1990). It is common practice for milk to be stored in creameries at 5°C for up to 24 h and sometimes longer. There is normally no problem with milk quality for milk so held, although psychographs can grow very slowly at below 5°C. These are generally biochemically active against fat and protein but do not usually ferment lactose to lactic acid. Thus cold-stored milk does not sour but can develop taints (Rowland, 1938; Szijarto *et al.*, 1990). Food Research Institute (FRI) and Hannah Research Institute has evolved methods for the estimation of resistant proteases and lipases in refrigerated milk. These enzymes begin to affect the quality of dairy products when a psychotropic count of about 5 million mL⁻¹ is attained. King and Mabbitt have shown that carbon dioxide can inhibit the spoilage of

refrigerated raw milk. The greater the concentration of cox and the lower the temperature to greater was the inhibition (Harding, 1987; Walstra and Jennes, 2001; Romas and Juarez, 1998).

The antibacterial lacto peroxides/thiocyanate/hydrogen peroxide system is active and gram-negative bacteria and it is suggested that this method could be useful extending the life of refrigerated raw milk in those tropical countries where it would be legally permissible (Canant, 1993; Muir, 1990). The stability of milk in various types of processing is of the greatest importance in dairy manufacture, particularly for sterilized, evaporated and sweetened condensed milk (Greig and Manning, 1983).

Milks from some cows and even from some herds may be thermo labile. The stability of milk to heat and other factors (acidity, rennet, concentration, freezing) is a complex phenomenon controlled by the physicochemical systems of the proteins and salts in the milk. Of the whey proteins the immune globulins are least, the β -lacto globulin and serum albumin fairly and the α -lactalbumin the most heat-resistant (Canant, 1993). Milk taints contain: (a)-sunlight or burnt feather flavor. This taint is of some importance in the USA and one of milk freshness or oldness determining methods is acidity degree determining. The most accurate way of measuring simple souring is to determine the lactic acid specifically unless the initial acidity is known. One of milk acidity measuring methods is clot on boiling test. C.O.B test alone has been used in Britain for some years as a measure of keeping or of bacterial quality for producer's milks for advisory

purposes. The full keeping quality test for milk involves holding it at a fixed temperature and testing it at time intervals for development of taint and clotting when boiled (Fox, 1992; Varnam and Sutherland, 1994).

MATERIALS AND METHODS

Materials and instruments were milks samples of goat, cow and sheep, thermometer, chronometer, pipette, glassy vessels, oven and citric acid. In this research, milks samples of cow, goat, sheep from Behbahan city animal husbandry were collected by hygienic method in closed cool dishes and were transferred to nutrition laboratory. Production of sheep milk was little in summer season. Keeping quality control test or time of reach clot on boiling were performed out on the milks samples (Szijarto *et al.*, 1990).

Resistant time of clot on boiling in the milk samples were measured after adding of 25 g citric acid to the samples at 4°C before boiling. Milk samples of cow, goat and sheep were holden at 36 and 4°C at different times periods 9.5 h (in oven), 59-96 h (refrigerator) and 20 h in free air and then time of reach clot on boiling were measured. The mean of time of reach clot on boiling were calculated by statistical method of means comparison ($p < 0.01$). Results showed that there is meaning different between samples.

RESULTS AND DISCUSSION

Obtained results have been showed in Table 1-5. Milks of cow, goat and sheep were compared from point of view of the mean of time (sec) of reach clot on boiling with statistical method t-test ($p < 0.01$).

Milks of cow and sheep which had been holden at 45°C (oven) for 9.5 h were compared from point of view of the mean with time (sec) of reach clot on boiling and there is meaning different and therefore sheep milk was more resistant than cow milk.

The mean time (sec) of reach clot on boiling in milks of cow and goat in the above holding condition were and there is meaning different. Therefore goat milk was more resistant than cow milk in this condition.

The mean time (sec) of reach clot on boiling in milks of goat and sheep were compared the above holding condition and there is meaning different. Therefore, sheep milk was more resistant than goat milk in this condition.

The mean time (sec) of reach clot on boiling in milks of goat and cow which were had been holden in 36°C in free air for 2 h were compared, it is observed there is meaning different. Therefore goat milk was very

Table 1: The mean of time (sec) of reach clot on boiling in cow, sheep, goat milks which were holden at 45°C (oven) for 9.5 h

Time (sec)	Samples
60	Cow milk
180	Sheep milk
120.4	Goat milk

Values are means of triplicated determination

Table 2: The mean of time sec of reach clot on boiling in boiled milks of cow and sheep which were holden at 36°C for 20 h

Time (sec)	Samples
120	Sheep milk
14.1	Cow milk

Values are means of triplicated determination

Table 3: The mean of time (sec) of reach clot on boiling in milks of cow and goat which were added 1 mL of citric acid at 4°C

Time (sec)	Samples
30	Cow milk
58	Goat milk

Values are means of triplicated determination

Table 4: The mean of time (sec) of reach clot on boiling in milks of goat and sheep which were holden at 45°C (oven) for 20 h

Time (sec)	Samples
20	Goat milk
---	Sheep milk

Sheep milk samples dried in above condition, values are means of triplicated determination

Table 5: The mean of time (sec) of reach clot on boiling in milks of cow goat which were holden 4°C (refrigerator) for 59 and 96 h, respectively

Time (sec)	Samples
59.1	Cow milk
120	Goat milk

resistant in comparison with cow milk. The mean time (sec) of reach clot on boiling in milks of cow and goat which had been added organic acid at 4°C and were compared, it is observed, there is meaning different. In the other hand, boiling heat will increase effect of added acid and therefore, it is observed milk proteins were sedimented in the samples. The mean time (sec) of reach clot on boiling milks of cow and goat which had been holden for 59 and 96 h at 4°C, respectively were compared and it is observed that there is meaning different.

CONCLUSION

Sheep milk, goat milk and cow milk are stable in holding different conditions, respectively. Sheep milk was more stable than cow milk. The different resistance of the samples depends on milk different composition.

Because fat contents of sheep milk, goat milk and cow milk are about 7.2, 4.5 and 3.5%, respectively and this different composition probably will delay milk proteins coagulation.

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