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DESIRABLE PHYSICAL AND RHEOLOGICAL PROPERTIES OF YOGURT PRODUCED WITH A TRADITIONAL STARTER COMPARED TO DIFFERENT COMMERCIAL STARTERS

Quasar Hamed ALKaisy[1*], Ashwaq Kadhim Rahi[1]

[1]Dairy Science and Technology Department, College of Food Sciences, Al-Qasim Green University, 8M4H+C33 street 8, 51001 Babylon, Iraq

[*]email: qayssarhamad@fosci.uoqasim.edu.iq

Abstract

Nowadays, much attention has been focused on improving the quality of dairy products. The current study aimed to compare the properties of yogurt produced by a traditional starter and some commercially available starters.

For this purpose, use low-fat cow's milk (1%) to make yogurt, a traditional starter, and three commercial starters (YO-MIX T12-LYO 100 DCU, 3- YO-MIX 495-LYO 100 DCU, and 4- YHL 092 E) were bought from the market. Yogurt is made by heating milk at 90 ^{0}C for 10 minutes. Then, it was cooled down to a temperature of 42 ^{0}C, each starter mentioned above was inoculated and then incubated at 42 ± 2 ^{0}C for 3 - 4 hours until the coagulation was done. After preparing yogurts, the pH of yogurt samples was assessed using a pH meter. Their acidity was titrated with NaOH (0.1 N). Rheological properties, including viscosity were determined by viscosity estimator, and the hardness, elasticity, and adhesion properties of yogurts were evaluated by the tissue analyzer. The spontaneous separation of whey was evaluated put 50 mL of yogurt sample in a bowl for 2 hours, after which separate whey was collected and measured the volume, water holding capacity was carried out by centrifuging 10 g of each sample. All measurements were made at (1, 7, 14 and 21) days.

The results showed a significant difference in the products' overall physical and rheological properties. The pH values of the treatments immediately after manufacturing on the 1 day were between 4.50 and 4.55 for all treatments, and pH values fell after 21 days of storage to become from 4.40 to 4.47. At the same time, total acidity has reached in all samples from 0.8 to 1.1 for the period of 1 - 21 days, respectively. The viscosity values of yogurt samples during 1 day were

1,500, 1,350, 1,340, and 1,600 centipoise, regarding traditional T12 LYO, 495 LYO, and 092 E starters, respectively. Also, an increase was observed in the viscosity of all treatments after 21 days, and this value for the treatments reached 1,800, 1,500, 1,490, and 1,840 centipoises, respectively. Hardness values ranged from 92 - 102 g at 1 day of storage for all treatments, while the hardness values of all treatments during cold storage increased for 21 days or 118 - 130 g, and the value of traditional treatment hardness and 092-E was higher than other treatments. Whey separation amounts of yogurt samples were at 1 day for each of the traditional starters, T12-Lyo, 495-Lyo, and 092-E (0.75, 0.7, 0.75, and 0.76) mL/50 mL, respectively, while a decrease in whey separation after 21 days was at 0.6, 0.5, 0.55, and 0.55 mL/50 mL, respectively. The water holding capacity of all samples in this feature was 20, 19.5, 19, and 20% regarding traditional starter types, T12 LYO, 495 LYO, and 092 E, respectively. This percentage also increased at 21 days of storage to 22, 21.66, 21, and 22%, respectively. The adhesion values of yogurt samples at 1 day of storage ranged from 0.56 to 0.64; it also noted a decrease in adhesion values during storage after 21 days between 0.48 and 0.57. Finally, the elasticity values of yogurt samples ranged from 1 day of storage 4.40 and 4.6 mm; the storage process reduced the elasticity value as it reached as after 21 days they reached from 3.48 - 3.7mm.

The conclusion from this study and based on the results, the traditional starter showed more desirable properties, especially concerning physical and rheological properties. Also, the samples of the YHL-092E starter had better quality than other commercial samples.

***Key words**: Yogurt, Starter, Rheological properties.*