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UTICAJ ODABRANIH FAKTORA NA BRZINU FERMENTACIJE MLIJEKA I VREMENA SKLADIŠTENJA JOGURTA

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Kiselost je jedna od najznačajnijih karakteristika kvaliteta jogurta, s obzirom na njen širok raspon variranja tokom skladištenja i temperaturnog režima kome je proizvedeni jogurt podvrgnut u lancu distribucije i prodaje, a čije povećanje može imati izrazito negativan uticaj na sam kvalitet proizvoda. Cilj istraživanja bio je ispitati uticaj dodatka bagremovog meda u različitim koncentracijama (2%, 4% i 6%) u kombinaciji sa 1% inulina i sa 1% koncentrata proteina surutke i termičkog tretmana mlijeka (85°C/20min ili 95°C/10min) na tok fermentacije mlijeka inokulisanog probiotskim i jogurtnim kulturama u koncentraciji 0,0025 % w/w. Proizvedeni su i uzorci bez dodataka. Fermentacija mješovitim probiotskim bakterijama (*Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus acidophilus* i *Bifidobacterium* ssp.) vođena je na 37°C, a jogurtnim kulturama (*Lactobacillus delbrueckii* subsp. *bulgaricus* i *Streptococcus thermophilus*) na 41°C do postizanja pH 4,6. Uzorci su brzo ohlađeni na 20°C i smješteni u frižider na 4°C±1. Mjerenja pH vrijednosti uzoraka (pH 510/mV Meter, Eutech Instruments Oakton, England) vršena su 1. 7. 14. i 21. dana skladištenja. Utvrđene su razlike trajanja i toka fermentacije. Dodatak inulina i koncentrata proteina surutke, kao i njihove kombinacije s medom, znatno su ubrzali proces fermentacije ($p<0,05$) u odnosu na kontrolne uzorke, bez obzira na primijenjeni termički tretman mlijeka. Međutim, različite primijenjene kulture nisu uticale na brzinu fermentacije mlijeka. Tokom skladištenja kod svih probiotskih uzoraka i kod tradicionalnog jogurta čije je mlijeko tretirano na 95°C/10min, uočena je značajna razlika u pH vrijednosti ($p<0,05$) između uzoraka 1. dana skladištenja, s jedne strane i uzoraka mjerenih 7, 14. i 21. dana, s druge strane. Kod uzoraka tradicionalnog jogurta, čije je mlijeko tretirano na 85°C/20min, nije bilo statističke razlike s obzirom na vrijeme skladištenja. Generalno, dodaci meda, inulina i KPS-a, znatno su ubrzali tok fermentacije, dok je kod svih uzoraka tokom skladištenja došlo do stabilizacije promjene pH vrijednosti od 7-og dana skladištenja.

Ključne riječi: jogurt, probiotik, med, inulin, KPS, pH

INFLUENCE OF SELECTED FACTORS ON THE SPEED OF FERMENTATION MILK AND YOGHURT STORAGE TIMES

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Acidity is one of the most important characteristics of yoghurt quality and this parameter can have a very negative impact on the product quality. The purpose of the study was to examine the effect of the acacia honey addition in different concentrations (2%, 4% and 6%) in combination with 1% inulin and 1% whey protein concentrate and milk thermal treatment (85°C/20min or 95°C/10min) on the milk fermentation speed, inoculated with probiotic and yoghurt cultures in a concentration of 0.0025% w/w. Samples without supplements were also produced. Fermentation with mixed probiotic bacteria (*Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus acidophilus* and *Bifidobacterium* ssp.) was performed at 37°C and with yoghurt cultures *(Lactobacillus delbrueckii* subsp. *Bulgaricus and Streptococcus thermophilus*) at 41°C until pH 4.6 was reached. The samples were rapidly cooled to 20°C and placed in a refrigerator at 4°C±1. Measurements of the pH samples value (pH 510/mV Meter, Eutech Instruments Oakton, England) were performed on 1^{st} ,7^{th}, 14^{th}, and 21^{st} storage day. Differences in fermentation duration and speed were determined. The addition of inulin and whey protein concentrate, as well as their combinations with honey, significantly accelerated the fermentation process ($p<0.05$) compared to control samples, regardless of the applied milk thermal treatment. However, the different applied cultures did not affect the speed of milk fermentation. During storage in all probiotic samples and in traditional yoghurt (95°C/10min), a significant difference in pH was observed ($p <0.05$) between samples on the 1^{st} compared to 7^{th}, 14^{th} and 21^{st} day. For traditional yoghurt samples whose milk was treated at 85°C/20min there was no statistical difference with respect to the storage time. In general, the addition of honey, inulin and KPS significantly accelerated the fermentation speed, while in all samples during storage there was a stabilization of the change in pH value from the 7^{th} storage day.

Key words: yoghurt, probiotic, honey, inulin, KPS, pH