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Isolation and identification of lactic acid bacteria (LAB) from Koozeh cheese, an Iranian cheese produced from raw milk

Mohammad Reza Edalatian* 1, Mohammad Bagher Habibi Najafi 1, Seyed Ali Mortazavi 1, Majid Hashemi 2

1*Department of Food Science & Technology, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran. 2:Member of department of food additives, Academic Center for Education culture and Research (ACECR), Mashhad, Iran

Corresponding author's email: mo_ed95@stu-mail.um.ac.ir

Objectives: The impact of lactic flora on the sensory and physical properties of different raw milk cheeses has been investigated worldwide. The aim of such investigations is to investigate the potential for industrializing the traditional products. No such investigation was performed on Iranian raw milk cheeses.

Materials & Methods: One of the most important Iranian raw milk cheeses known as Koozeh was investigated with respect to lactic flora. Samples were collected randomly from this cheese producing regions (Uremia, Azerbaijan Province) from several local factories. Diluted samples were cultured on MRS for Lactobacilli, M17 for Lactococci and KAA for Enterococci. After several sub-culturing for purification purpose, gram staining, catalase tests and some confirmatory tests were conducted for purified colonies (isolates). Finally API 50 CH and 20Strep kits were used for species and sub species identification. Profiles obtained with a given technique were compared to each other by the simple matching coefficient.

Results & Conclusion: 48 isolates were identified from different media. In fresh Koozeh cheese the main detected strains were L. lactis spp. lactis (44.44%), L. plantarum (22.22%), L. brevis (11.11%), Pediococcus spp. (11.11%) and Ent. faecium (11.11%). In ripened Koozeh cheese samples Ent. faecium (43.58%) was the predominant known species followed by L. brevis (12.82%), L. plantarum (5.12%), L.delbrueckii spp.delbrueckii (5.12%), L.lindneri (2.56%), L.helveticus (2.56%), L. lactis spp. lactis (5.12%), L.pentosus (2.56%), L.fermentum (2.56%), Ent. faecalis (7.69%), Ent. avium (2.56%), Ent. durans (2.56%) and Aerococcus viridians (5.12%). Dendograms obtained from API 50 CH and API 20 STREP showed high diversity among strains. In fresh and ripened koozeh cheese the main species were L. lactis spp. lactis and Ent. faecium, respectively. Carbohydrate fermentation profiles obtained from API 50 CH and API 20 STREP showed that some strains have identical profiles and also dendograms revealed high diversity among some strains.

Keywords: Raw milk cheese, lactic flora, ripening period, diversity, API methods.

Application of Zedo gum in probiotic yoghurt production

Zahra Ghasempour, Mohammad Alizadeh, Mahmoud Rezzad Bari

Food Science and Technology Department, Agricultural Faculty, Urmia University, Iran

Corresponding author's email: ghasempourz@yahoo.com

Objectives: Yoghurt is probably the most widely consumed form of fermented milk. Demand for functional and low fat dairy products has increased due to therapeutic benefits. Reduction of fat and subsequently reduction of total solids content leads to poor texture, unless alternative materials are used. Moreover, typical flavor of a product is part of its identity. Evaluation of yoghurt flavor is based mainly on acetaldehyde production. The objective of this study was to investigate the potential use of Zedo gum as a fat replacer in low fat yoghurt, its effects on probiotics survival (Lactobacillus acidophilus and Bifidobacterium bifidum) and acetaldehyde content of yoghurt during storage.

Materials & Methods: Zedo at 0, 1 and 2%, LA5 and BB12 at 0, 10 and 20gr/100gmmilk, incubation at 37, 40 and 43°C, storage days of 1, 15 and 29 were studied using factorial experimental design. For enumeration of LA, MRS-agar and BB, MRS-agar with filter-sterilized lithium-chloride 2% and propionate-sodium 3% were used. Acetaldehyde was quantified by GC-FID. Calibration mixture consisted of acetaldehyde and methyl acetate volumed by acetone. Yoghurt was dissolved in aceton as solvent. Solvent with entrapped volatiles is injected into GC. Viscosity was measured at shear rate of 30rpm using Brookfield viscometer.

Results & Conclusion: Probiotics: Inoculation levels of probiotics influenced on their survival rate. Probiotics decreased during storage, due to antagonistic relationships between starters and BB and reduction of LA is due to acidity and hydrogen peroxide. Incubation temperature (IT) and Zedo gum didn't affect probiotics survival. Acetaldehyde: IT and storage time influenced acetaldehyde contents. Acetaldehyde content increased during storage. Probiotic concentrations and Zedo had no effects on acetaldehyde contents. Starters' alcohol dehydrogenase activity and evaporation are responsible for acetaldehyde decrease. LA strains possess low alcohol dehydrogenase activity. Thickeners affect the aroma release as a function of chemical characteristics of aroma compounds. Viscosity: Viscosity was affected by IT and Zedo content. Interactive effects of inoculation level by IT and storage time were also significant. Maximum viscosity was obtained at high levels of Zedo and IT. Viscosity increased by storage time. Zedo effect is due to interactions with milk constituents. Positive effect of IT on viscosity could be attributed to high hydration rate of Zedo gum at high temperatures. Probiotic effects can be related to exopolysaccharide production and viscosity increases can be attributed to hydration of gum by time. Resulted optimum conditions: 12.24gr/100kg milk probiotics, 41.66°C IT, 0.2% gum, day 29.

Keywords: Probiotic yoghurt, Acetaldehyde, Zedo gum, Viscosity.