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**Effect of emulsifiers on stability of ice cream: identifying best emulsifier and stabilizer blend**

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Emulsifiers are being added to ice cream in order to maintain the emulsion of the ice cream mixture, to make the ice cream smooth and easy to handle, and to increase its resistance to melting. Therefore, the present study was design to investigate the effect of different emulsifiers (mono & di glyceride (MDG), polysorbate 80 (P80), the mixture of polysorbate 80 and mono & di glyceride (80: 20) and lecithin) on stability of an ice cream mixture and finally to select the best emulsifier and stabilizer blend for the ice cream manufacturing process.

Samples were prepared using four different emulsifiers that were analyzed for physico-chemical (melting properties, fat, total solids, appearance and overrun) and sensory characteristics. The mixture of MDG and P80 incorporated ice cream had the highest melting resistance while lecithin incorporated ice cream the lowest melting resistance. Overrun, total solids percentage and fat percentage were significantly affected ( $P < 0.05$ ) by the treatments. Physicochemical parameters (overrun, total solids and fat) revealed that the mixture of MDG and P80 was the best emulsifier which can be used for emulsifying ice cream. Better appearance was shown by the ice cream prepared using a mixture of MDG and P80 when compared with the other three emulsifiers. On organoleptic evaluation the highest scores were awarded to the lecithin incorporated ice cream while the lowest scores were awarded to the P80 incorporated ice cream. It was found that different emulsifiers affected the texture and the quality of the ice cream.

Kelgum (MDG = 0.3%), Ice pro (propane-1,2-diol = 0.3% & MDG = 0.15%) are some of the emulsifier and stabilizer blends which are mainly used in the ice cream industry. Heat shock treatment was tested for Kelgum and Ice pro. Following heat shock treatment, samples were evaluated by paired comparison for sensory properties and physical appearance.

Following heat shock and paired comparison sensory evaluation, the highest scores were awarded to the Ice pro incorporated ice cream followed by the Kelgum incorporated ice cream. In conclusion the physical appearance of the Ice pro incorporated ice cream was better than that with Kelgum, due to the smoother texture, low ice crystal formation and taste.

Keywords: Overrun, heat shock, organoleptic evaluation, stabilizer, Kelgum, Ice pro