

Development of Gelatin-Free and No-Added-Sugar Stirred Yogurt for Toddlers Using Transglutaminase as a Natural Stabilizer

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With the growing awareness of the impact of early nutrition on lifelong health, the demand for toddler-friendly food products free from additives like gelatin and added sugars is increasing. Despite this, Sri Lanka currently lacks dairy products specifically formulated for toddlers. This study focused on developing a stirred yogurt tailored to toddlers, emphasizing natural formulation by excluding gelatin and added sugars. Transglutaminase (TGase), a food-grade enzyme known for its protein cross-linking ability, was employed as a clean-label stabilizing alternative. The yogurt was packaged in user-friendly squeezable pouches for ease of consumption by young children. Four different TGase concentrations (0.005%, 0.01%, 0.02% and 0.03%) were assessed against a gelatin-containing control over a 14-day refrigerated storage period. Assessments included physicochemical parameters, microbiological safety, probiotic viability, compositional content (protein, ash, moisture), caloric value, and consumer acceptability based on parental sensory feedback. All samples retained probiotic viability above 10⁷CFU/g throughout the testing period. Sensory evaluations were done using 5 point Hedonic scale with 30 panelists. Yogurt formulation added with 0.01% TGase achieved the highest score in terms of texture, appearance & overall acceptability. The findings suggest that TGase is a viable alternative to gelatin in toddler-specific dairy applications, offering a pathway to clean-label, age-appropriate yogurt products. However, further improvement is needed to enhance water holding capacity and extend shelf life naturally.

Keywords: Toddler nutrition, transglutaminase, yogurt pouches, no added sugar, gelatin substitute

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