

## **Development of Two Types of Isotonic Beverages with Functional Attributes Using Natural and Synthetic Ingredients**

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A solution's impact on a cell's volume is correlated with its tonicity. Isotonic solutions are those that do not alter the volume of a cell when ingested. Since dehydration impairs athletic performance and raises the risk of injury, lost fluid during physical activity has to be replaced as quickly as possible with required levels of energy and electrolytes. For this replacement, an isotonic beverage is ideal, because it can be directly absorbed to the body within a short period of time. However isotonic sports beverages have requirements to be met in the carbohydrate and electrolyte concentrations. This research aims to develop commercially viable and economically feasible two formulations of isotonic drinks using synthetic ingredients and natural ingredients with functional attributes. Study was conducted in two phases as preliminary trial and final trial for each synthetic formula and natural formulas. Samples from preliminary test were tested for the osmolality to figure out the final treatments of sensory evaluation. Data was analyzed through SPSS software. Preferred final samples were analyzed for their mineral content and physicochemical characteristics. Final formulas were in the required ranges of osmolality (270-330 mOsm/kg) and sodium content (460 - 1150 mg/L) it to be an isotonic beverage according to the international regulations. Synthetic sample contains an osmolality of  $284 \pm 1$  mOsmol/kg and sodium content of  $688.2 \pm 17.7$  mg/L. Additionally, natural formula with artificial sweetener and 100% natural formula contains an osmolality and sodium content in the ranges of  $307 \pm 11$  mOsmol/kg,  $716.6 \pm 5.8$  mg/L, respectively. As conclusions, developed formulas adhere to the requirements of an isotonic beverage, which could enhance the performance of dehydrated athletes. There is a high potential to use coconut water and bee honey in Sri Lanka, as rich mineral and energy sources to formulate isotonic beverages.

**Keywords:** Dehydration, Electrolytes, Energy, Isotonic, Osmolality

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