

## ABSTRACT

*Rasgulla*, a dairy dessert, is one of the most famous Indian traditional sweet, famous globally due to its distinct texture, flavor and aroma. *Rasgulla* is sugar heavy dessert as it cooked and soaked in sugar syrup. The higher amount of sugar content in *rasgulla* becomes the reason for obesity and diabetes. Therefore, anti-diabetic *rasgulla* was developed by reducing sugar content and increasing protein content. Natural non-nutritive sweeteners such as stevia and coconut sap were used in cooking and soaking syrups at different level along with sugar to develop *rasgulla* for health conscious and diabetic patients. Defatted soy flour was incorporated in *chhana* balls as binding material to increase the protein content of *rasgulla*. Proximate composition, chemical and textural analysis of all treatment of *rasgullas* was performed along with sensory evaluation to check the overall acceptability of product. Response surface methodology (RSM) was used to optimize the concentration level of stevia and sugar in cooking and soaking syrups with the aim of obtaining quality parameters in standard range. Shelf life of *rasgullas* was determined by chemical and microbial analysis during storage period and animal testing was done to obtain the effect of reformulated *rasgullas* on blood glucose of diabetic rats.

*Rasgulla* prepared with 100% stevia reduced the sucrose content by 96.4%. Incorporation of defatted soy flour increased the protein content by 82.26%. Low sugar and high protein content *rasgulla* with overall acceptable quality was developed by 20:80 ratio of coconut sap to sugar. The optimum concentration level was found to be 75:25, stevia to sugar ratio in syrups for obtaining highly acceptable *rasgulla*. *Rasgulla* prepared with 75% and 20% replacement of sugar with stevia and coconut sap in syrups was highly accepted by sensory evaluation. Cost of *rasgulla* was increased by 116.66% and 20% when sugar was replaced by 75% stevia and 20% coconut sap respectively. The stevia level showed significant protection against formation of free fatty acid and acidity development. Higher level of stevia was more effective to increase shelf life of *rasgulla* at refrigerated temperatures throughout the storage period. The changes in textural parameters were relatively slower when stored at room temperature than refrigerated storage. Stevia showed high potential in tolerating glucose level and controlling blood glucose level of the STZ-diabetic rats. Stevia controlled the diabetes of the STZ-diabetic rats but did not cure.

**Keywords:** Blood glucose level, coconut sap, defatted soy flour, optimization, *rasgulla*, stevia