

Ingredients optimization in jaggery based nuggets with spices using RSM

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SUMMARY : Optimization of jaggery based chocolate nugget was done using response surface methodology (RSM). Thirty chocolate nugget formulations were processed by mixing basic ingredients: cocoa powder (15, 20, 25, 30 and 35g), cocoa butter (50, 55, 60, 65 and 70g) and black pepper powder (1, 1.5, 2, 2.5 and 3g) in per 100 g jaggery powder. The experimental design was based on Response Surface Methodology using Center Composite Rotatable Design in 4 variables. Sensory evaluation score were taken as dependent variables representing the product quality. Optimum formulations were all the combinations of cocoa powder 8.59 per cent, cocoa butter 26.98 per cent, SMP 22.57 per cent and black pepper powder 0.86 per cent at 4 h. of conching at 55-60°C.

KEY WORDS : Jaggery, Nugget, Cocoa butter, Conching, SMP, RSM

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Chocolate conching is known to be one of the key quality driving steps in chocolate manufacturing. The initial dry conching phase is very important to decrease moisture and to improve rheology. The final liquid conching phase, initiated by lecithin and cocoa butter addition (Fischer *et al.*, 2005). The conching stages are filling, low-fat conching (dry conching, plasticising), addition of remaining fat and emulsifier, liquid conching.

Jaggery, commonly known as *gur* is one of the products of sugarcane. During processing the white crystal sugar loses natural minerals and vitamins and requires extra energy for its

digestion which is taken from body. On the other hand, jaggery being a low cost traditional, eco-friendly and nutritive sweetener offers a viable alternative. It may look less attractive than crystal sugar but it is a healthier food.

The main objective of work was to develop jaggery based chocolate nuggets with spices and nuts by applying conching process and to optimize the chocolate nuggets using Response Surface Methodology.

EXPERIMENTAL METHODS

Powder jaggery, cocoa powder, skim milk powder, cocoa butter, nuts (almond) and spices black pepper powder were the main ingredients for jaggery chocolate nugget.

The powder jaggery was purchased from the local market of Rudrapur, dist. U.S. Nagar, Uttarakhand. Cocoa butter and cocoa powder was procured from Laxmi trading company, Lucknow.

Experimental set up :

Wet grinder of Maharaja company working on shear force principle was used as concher. Concher is provided with steel pot having stone base and two stone rollers. Rollers are placed inside the pot move in opposite direction of pot movement.

Hot air blower was used to maintain the temperature

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