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SHORT COMMUNICATION

PHYSICOCHEMICAL PROERTIES OF GELATIN THAT ENHANCESUGAR CRAFT EXPRESSIONS

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ABSTRACT

Sugars processed into granulated form known as confectioners (icing) sugar were further processed into different forms of royal, butter and fondant icings respectively and sensory evaluation carried out on its texture and expression of characters, beauty and elasticity. Royal icing was appreciated in its character expression, considered beautiful, not elastic and hard. Butter icing was appreciated in its character expression, considered beautiful, not elastic and soft. While the fondant icing was highly appreciated in character expression, considered very beautiful, not hard and elastic due to the physicochemical properties of gelatin that aided beauty and character enhancement to the fondant icing over the royal and butter icing respectively.

KEYWORDS: Sugar, Gelatin, Protein, Sensory evaluation.

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INTRODUCTION

Sugar an essential food used domestically in homes as sweeteners and industrially to produce foods referred to as sweets like biscuits, gums ,beverages and a lot more are produced in different forms like powdered glucose, liquid glucose, cubed table sugar, and confectioners' sugar to mention a few . Confectioners' sugar known as icing sugar is granulated sugar that has been crushed into fine powder with small amount of corn starch and anti-caking agents like calcium phosphate added to it (Herbst, 1998) are used as beautifying agents on cakes of different purposes. The idea of decorating cakes with sugar is basically known as sugar craft. Some various kinds of cake decorations are royal icing, butter icing, glace icing, and fondant icing. These icings differ in constituents that that make up the respective icing mixtures. The royal icing is a mixture of icing

sugar, egg white (albumin), cream of tartar, and flavor concentrates. It is used for boarder formation, writing, floral formation and figure piping. Butter icing is a mixture of margarine, icing sugar, flavor concentrates egg whites and milk which are optional) and has the same use as royal icing. Glace icing is a mixture of icing sugar and water while the fondant icing is a mixture of gelatin, glucose, icing sugar, glycerin, and carboxyl methyl cellulose (CMC), and gum tragacant which are optional. These various icings add beauty and different texture on the cake. The royal icing is hard in texture and definite in its designs while the butter icing is soft and definite .The fondant icing is not hard but explicit and can form a lot more characters than the former two after finishing respectively (Wilton 2003).

Gelatin, a fibrous protein and widely used in the food industry to an estimated quantity of 200,000 metric tons, hydrolyzed from collagen (Eastoe and Eastoe 1952) found in bones and cartilage of animals, is tasteless, translucent and brittle compound. It is a gelling agent, stabilizer(Abbey *et al*., 2008) and thickener. It consists of the tertiary structure of protein which exhibit the three dimensional structure in proteins. It is high in an amino acid, glycine and proline and hydroxyproline which are imino acids in its primary structure and its low ash content makes it suitable in food application. Other features of gelatin are its viscoelastic properties (Hamman 1991) which are as a result of the secondary and tertiary structure properties in proteins. This property of gelatin enables fondant icing form different shapes of different length and in turn different characters when it binds with sugar molecules.

The aim of this work is to further educate bakers the role of gelatin in fondant icing and the edge fondant icing has over other icing in character formation.

MATERIALS AND METHODS

Fruit cakes were made and three different icing mixtures of royal, butter and fondant were made to cover the cakes. The following procedures were used for the icings.

Royal Icing

To 500g of icing sugar add egg whites from two eggs with a pint flavor concentrates and two tea spoons of cream of tartar. Mix thoroughly in a cake mixer and apply on the cake when thoroughly mixed. Use a piping tool with nozzles on beautifying the cake.

Butter Icing

To 500g of icing sugar, 300g of margarine and pint of flavor concentrate were put in a cake mixer. Apply on cake when mixed thoroughly. Use a piping tool with nozzles on beautifying the cake.

Fondant Icing

To 500g of icing sugar, a table spoon full of liquid glucose, a table spoon of gelatin, with a tea spoon of glycerin was added in in a bowl and kneaded till viscosity and elasticity was achieved.

The resultant mixture was mixed on a smooth surface and rolled on the cake. Respective cutters and moulds were used to design the cake.

Sensory Evaluation

The respective iced cakes of royal, butter and fondant were put on display and presented to ten elite staff of the National Centre for Agricultural Mechanization (NCAM) for sensory evaluation using the method described by Taiwo *et al* (1997). The panelists were asked to indicate their observations using a 5 point hedonic scale for character expression, beauty, elasticity, hardness and softness. Highly appreciated and not appreciated were ranked between 5-1 respectively.

RESULTS AND DISCUSSION

From the three icing mixtures of royal, butter and fondant icings made respectively, the following conditions were deduced (Table 1). The royal icing was soft and non-elastic when applied on the cake but hardened up after exposure to the air. The icing mixture was also able to form flora, basket weave, lace and borders with the aid of a piping tool which consists of different shapes of nozzles which made its decorations definite. The butter icing was soft and non-elastic. It remained soft due to the texture from the margarine and formed all characters the royal icing formed with the aid of the piping tool. The fondant icing attained elasticity and viscosity after mixture. It was able roll to certain lengths and could form definite shapes with the aid of cutters. In addition it could form moulds using cutters and bare hands to form flora and also had the ability of been attached to metal threads which enhanced the beauty and added complexity than the former. Furthermore human characters, shoes, fruits and a lot more were created with the aid of their respective moulds. This enhancement in the beauty and character expression was due to the helical structure and protein folds from gelatin that enabled the icing have these features.

Table 1: SENSORY EVALUATION TABLE

Item	Royal	Butter	Fondant
Character Expression	3.8^{b}	3.9^{b}	4.7^{a}
Beauty	4.2^{b}	4.25^{b}	4.9^{a}
Elastic	0.1^{e}	0.25^{d}	4.2^{a}
Hard	4.8^{a}	0.2^{e}	1.5^{d}
Soft	0.1^{e}	4.9^{a}	3.5^{b}

Means follow by different superscript written in column are significantly different ($p \geq 0.05$)

5 = Highly Appreciated
4 = Appreciated
3 = Fairly Appreciated
2 = Below Appreciation
1 = Not Appreciated

CONCLUSION

From the sensory evaluation carried out, the physic chemical properties of gelatin aided beauty, character expression and elasticity to the cakes iced with fondant icing over the butter and the royal icing.

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