

# Production of Marshmallows by Using Colostrum

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**Abstract:** Food technology is a branch of Engineering that deals with recent trends in food science and technology. Through this branch of study, we can easily bring about lots of changes in the food products that we are consuming every day. Therefore, we students of JCT college, has planned to bring a value-added product –the marshmallow. It comes under the category of candies where this product has allured many of the kids. But it has lots of dreadful ingredients in it, for example gelatin, maple starch and some gelling agents. We had made a little modification in which we are using the colostrums and the egg white as a thickening agent, which acts as the best nutrition product and a harmless product, though it costs much yet it serves to be the best product for consuming. Colostrum and eggwhite are rich in protein, calcium and lactose and many nutrition supplement. Therefore, it serves to be the best protein supplement product-marshmallow using colostrums.

**Key Words:** - Marshmallow, Gelatin, Dreadful ingredients, Proteinaceous colostrum, Harmless marshmallows.

## I. INTRODUCTION

**Marshmallow** (UK: /mɑːrʃˈmæloʊ/, US: /ˈmɑːrʃməloʊ, -məɪ-/) is a type of confectionery that is typically made from sugar, water and gelatin whipped to a squishy consistency. It is used as a filling in baking, or commonly molded into shapes and coated with corn starch. This is the modern version of a medicinal confection made from *Althaea officinalis*, the marshmallow plant. Whether you're gathered around a fire or drinking hot chocolate after a day in the snow, nothing says sweet, squishy fun quite like a marshmallow! Even its name is soft and spongy! Have you ever wondered how marshmallows are made? Long ago people made marshmallows with ingredients from the marshmallow herb, but today we usually make them with other ingredients, namely gelatin, corn syrup and sugar. In this appetizing activity you'll get to explore what ratio of sugar to corn syrup produces the best-tasting and best-textured marshmallows!



Fig.1. Marshmallows

Marshmallows are an unusual type of sweet treat—spongy, sticky and a little bit chewy. They have a melting point that is

just above body temperature so that they start to change from a solid to a liquid state as soon as they reach the warmth of your mouth—or the heat of a fire! They're also an ancient creation, originally coming from a tall marshmallow plant (*Althaea officinalis*) that grows in swampy fields and has a soft, spongy root. Its root contains mucilage, a thick, gluey substance produced by some plants and microscopic animals to help with food storage and seed germination.

### A. History of Marshmallow:

The word "marshmallow" comes from the mallow plant species (*Althaea officinalis*), a herb native to parts of Europe, North Africa, and Asia which grows in marshes and other damp areas. The plant's stem and leaves are fleshy and its white flower has five petals. It is not known exactly when marshmallows were invented, but their history goes back as early as 2000 BC. Ancient Egyptians were said to be the first to make them, and eating them was a privilege strictly reserved for gods and for royalty, who used the root of the plant to soothe coughs and sore throats, and to heal wounds. The first marshmallows were prepared by boiling pieces of root pulp with honey until thick. Once thickened, the mixture was strained, cooled, and then used as intended.

### B. Marshmallow as A Candy:

In the early to mid-1800s, the marshmallow had made its way to France where confectioners augmented the plant's traditional medicinal value with indulgent ingredients utilized by the Egyptians. Owners of small candy stores would whip the sap from the mallow root into a fluffy candy mold. This candy was called Pate Guimauve. It was a spongy soft dessert made from whipping dried marshmallows roots with sugar, water and egg whites. It was sold in bar form as Lozenge. Drying and preparing of the marshmallows took one to two days before the final product could be produced.

### C. Ingredients Used:

Marshmallows consist of four ingredients:

- sugar, water, air, and a whipping agent/aerator (usually a protein).
- Protein
- Albumen (egg whites)
- Gelatin
- Sugars
- Sucrose
- Corn syrup
- Invert sugar

Additional ingredients for flavors:

- vanilla essence
- Acids

## II. PROCESS FOR MAKING MARSHMALLOWS

The process for making marshmallows includes three steps, they are:

1. Whipping
2. starch mogul system
3. extrusion.

*Whipping:* The process in which the egg whites and the sugar is whisked in which it is uniformly distributed so that it forms a thick consistency.



Fig.2. Whipping

The whipping is the process for making a uniformly distributed thick batter of egg whites and powdered sugar.

*Starch mogul system:* A starch mogul is a machine that makes shaped candies or candy centers from syrups or gels, such as gummi candy. These softer candies and centers are made by filling a tray with cornstarch, stamping the desired shape into the starch, and then pouring the filling or gel into the holes made by the stamp. When the candies have set, they are removed from the trays and the starch is recycled.



Fig.3. Starch mogul system

*Extrusion:* Extrusion is a continuous process through which parts of a fixed cross-sectional profile are made. Material is fed through a hopper into an extruder, essentially a rotating screw surrounded by a heated barrel, where it is mixed, melted and pumped through a die. The die gives the part its shape. through this process we can get the different shapes of marshmallows.



Fig.4. Extrusion

## III. COLOSTRUM

Colostrum (known colloquially as beestings, bisnings or first milk) is the first form of milk produced by the mammary glands of mammals (including many humans) immediately following delivery of the newborn.



Fig.5. Colostrum

Most species will generate colostrum just prior to giving birth. Colostrum contains antibodies to protect the newborn against disease. In general, protein concentration in colostrum is substantially higher than in milk. Fat concentration is substantially higher in colostrum than in milk in some species, e.g. sheep and horses, but lower in colostrum than in milk in some other species, e.g. camels and humans. In swine, fat concentration of milk at 48 to 72 hours postpartum may be higher than in colostrum or in late-lactation milk. Fat concentration in bovine colostrum is extremely variable.

#### A. Colostrum as A Substitute for Gelatin

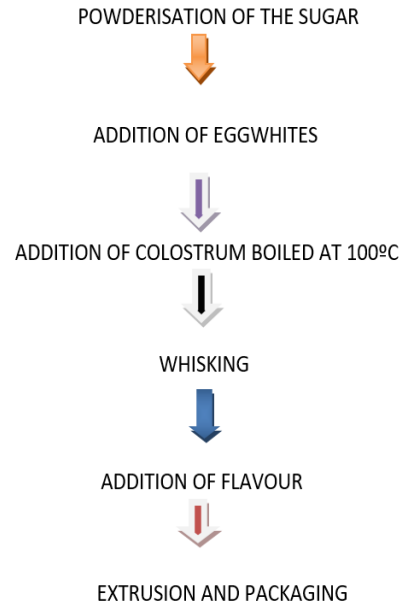
Gelatin is usually made from the skins of pigs, therefore Muslims considered it as HALLAL and they are not using gelatin based foods, also certain vegans they hesitate to use this gelatin in cooking, therefore we can click our option to Colostrum, in which it acts as the best thickening agent. Therefore, it binds the marshmallow together and it holds the candy as the best thickener.

#### B. Benefits of Colostrum



## IV. METHODOLOGY

### A. Flowchart



#### *Powderisation of Sugar/Addition of Sugar Syrup:*

You can powder the sugar or you can find corn syrup (also called glucose syrup) that prevents crystallization. If you have candy thermometer, set it to 240°-245°F (firm ball stage). Mixture is ready when the thermometer reaches 240°F-245°F. If you have an alarm, set it about to 238°F, because the sugar mixture will get hot very quickly.

#### *Addition of Egg Whites:*

Adding eggwhites makes the candy softer and spongy, therefore only egg whites are added to get foamed candy that is the marshmallow.

#### *Preparation and Addition of Colostrum:*

The colostrum is boiled to 100°C and then it is checked with the candy thermometer and when the milk is sterilized it is boiled again so that it gets thickened and afterwards the beestings is added to the mixture.

#### *Whisking:*

The colostrum and the egg whites and the sugar syrup are whisked and therefore they are maintained at the specified consistency is obtained.

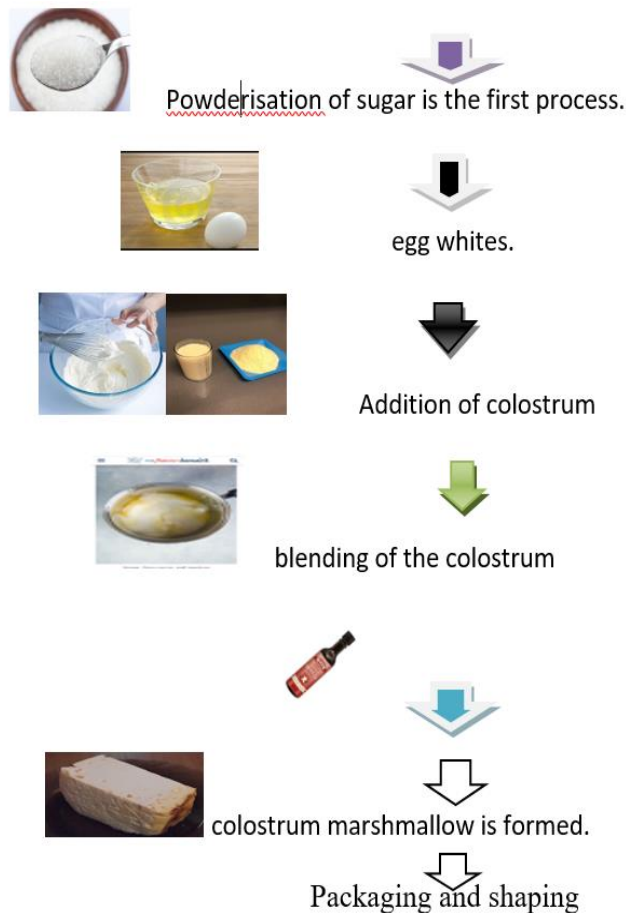
#### *Addition of Flavor:*

If you want special flavors you can add the special flavors, the best flavor is the vanilla essence and also we can add other according to the taste of the consumers.

#### *Extrusion and Packaging:*

Extrusion is done for shaping the candies in threads and then bringing out special shapes and then the marshmallows are packed.

### B. Overall Diagram for The Preparation of Marshmallows



Thus the marshmallow using colostrum is formed successfully.

## V. RESULT AND DISCUSSION

### A. Ordinary Vs Colostrum Marshmallows:

- The ordinary colostrum is made up of using many chemical and harmful substances whereas the colostrum marshmallow is excluding those harmful substances.
- The colostrum is an important proteineaceous and nutrition supplement product.

- The colostrum marshmallow gives many health benefits.

## VI. CONCLUSION

We are living in the world filled with smart machines but we forgot about our health and welfare, therefore this colostrum marshmallow is very special and it also saves as the best product for the nutritious supplement for kids, though the colostrum seems to be costly but the process is very much easier and also it is the best for the kids in smart world.

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