

Tootsie Rolls®

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Materials Needed

- ¼ cup unsweetened cocoa powder (Hershey's or equivalent)
- 1 cup powdered sugar (also called confectioner's sugar)
- ¼ cup dry milk powder (not instant milk powder)
- ¼ cup corn syrup (light Karo syrup or equivalent)
- 2 Tablespoons unsalted butter, melted
- Pinch of salt

Safety

Safety glasses or goggles must be worn in the laboratory at all times.

This experiment is best performed at home or in a home economics laboratory. If this experiment is performed in a chemistry laboratory, all work surfaces must be cleaned and free from laboratory chemicals. After cleaning work surfaces, it is advised to cover all work areas with aluminum foil or a food-grade paper covering.

All glassware and apparatus must be clean and free from laboratory chemicals. Use only special glassware and equipment, stored away from all sources of laboratory chemical contamination, and reserved only for food experiments is recommended.

There are no safety hazards associated with the materials used in this experiment.

Disposal

Generally, all waste materials in this experiment can be disposed in the trash or poured down the drain with running water. All disposal must conform to local regulations.

Procedure

Sift together the cocoa powder, confectioner's sugar, dry milk powder, and salt into a medium sized bowl (1 to 2 quarts). Set this aside.

Measure the corn syrup. Add the butter to the corn syrup and mix well to combine as completely as possible.

Pour the corn syrup mixture into the dry ingredients. Mix well. It will take a couple of minutes of mixing until all the ingredients are combined. It may look like there is not sufficient liquid for everything to mix, but DO NOT add any additional liquid.

Once everything is combined, scrape the mixture out onto a plastic or glass cutting board. Knead the mixture until it is uniform and smooth. If it is too soft, you can add small amounts of confectioner's sugar.

Separate the dough into 3 or 4 pieces. Roll each piece into a rope about 1 cm (about ½ inch) in diameter. Using a knife, cut the rope into pieces about 2.5 cm (1 inch) long.

Place the cut pieces onto a baking sheet. Place the sheet and the Tootsie Rolls into the refrigerator or a cool place to set up for about an hour.

Wrap the Tootsie Rolls in wax paper.



Explanation

Tootsie Rolls® are not a fudge or a caramel, but somewhere in between.

Commercial Tootsie Rolls are made with sugar, corn syrup, soybean oil, condensed skim milk, cocoa, whey (the liquid remaining from milk used to make cheese – it may be in the form of whey powder), lecithin (an emulsifier), and artificial and natural flavors. This mixture requires some cooking to combine all the ingredients.

This recipe does not require any heating or cooking other than melting the butter.

Powdered sugar (confectioner's sugar) is used to eliminate cooking which would be needed to dissolve the crystals of granulated sugar. Sugar crystals would give a coarse mouth feel.

Commercial Tootsie Rolls contain about 3 g of fat per 40 g serving size. Since the ingredients in this recipe are fat-free, the function of the butter is to add a small amount of fat to the mixture. The fat helps in emulsifying the ingredients, contributes to the flavor and mouth feel, and adds some gloss to the finished product.

The dry materials need to be sifted to remove any lumps and insure complete mixing. Sifting also separates the powder which makes it take longer to hydrate it when mixing.