

Bee Fondant Candy

10 lbs sugar (white table sugar), 2 pints (4 cups) water

¼ teaspoon of apple cider vinegar per pound of sugar

(e.g. distilled white or table vinegar is OK)

10 lbs of sugar = 2.5 teaspoons apple cider vinegar

1 cup dry pollen substitute or soy flour or rye flour (optional), 1 pinch of salt

Needed Equipment

1 large pot (stainless steel) approx. 10" diameter x 9.5" tall

(Better too tall because if it boils over it's a PROBLEM)

1 long handled wooden spoon, 1 candy or laser thermometer

(The laser thermometer may have issues while the fondant is boiling so temporality remove it from the heat, then check the temperature and reapply heat if necessary)

Pans or molds for fondant (I use 10" wax coated paper plates)

Electric mixer (a must), Measuring spoon, Oven gloves, Wax paper, Spatula

1. Bring water to a boil with salt and apple cider vinegar added.
2. Reduce heat and add approximately 1 pound of sugar at a time to the boiling water because it's easier to manage.
3. Slowly stir WITHOUT stopping until the mixture boils. I use a wooden spoon. Once boiling, stop stirring, if you continue it might foam over.
4. Once the mixture is boiling and has reached your target temperature, remove from heat and let cool. Max temperature of 238 for fudgy, 250 for rock candy. I shoot for approximately 245; Give the cooling process plenty of time.
5. There is a relationship between temperature, time and mixing. I have yet to discover the exact time relationship. **Mixing plays a big role in hardening.**
6. Once the mixture has cooled to 220-200 degrees you can add your pollen sub or soy or rye flour **if desired**. Either way, use an electric mixer. **NOTE:** The last time I waited for it to cool to 200 it started thickening too soon.
7. Pour the fondant into your molds or pans; It will be VERY hot so be careful.
8. This mixture will take a few hours to cool, do not rush this part. I store the cooled plates of fondant in 5 gallon buckets separated by wax paper.
9. The hardness of the candy is determined by the amount of water left in the mixture. So if you cook it to the right temperature, but water keeps leaving while you're waiting for it to cool, it can possibly go to the next stage of hardness.
10. I noticed a difference in the color of the liquid while cooking.

10 lbs of sugar makes about 6 – 7 plates of fondant.

Bee Fondant vs. Sugar Blocks:

The difference between fondant and a sugar cake (block) is that the sugar in the fondant has been inverted — breaking the sucrose molecule into glucose and fructose molecules which the bees can more readily use for energy — much like honey.

Honey bees process nectar for honey by mixing it with secretions from the hypopharyngeal glands in their heads, which are full of enzymes (e.g., invertase) used to invert complex sucrose into glucose and fructose; Basically converting complex sugars into the simple glucose and fructose.

Glucose and fructose can be absorbed directly from the digestive tract of the bee without further digestive work being done. Sucrose (sugar) must first be digested and converted to glucose and fructose, so it's not as an efficient energy source.

I figure if a hive is in distress and needing food, especially going into winter, having something that can be used more easily for energy makes more sense; Hence, using bee fondant instead of sugar blocks.

Comments on Cream of Tartar, Apple Cider Vinegar and High-Fructose Corn Syrup:

Cream of tartar is used in human candy recipes to help stabilize the candy and keep it clear. Bees don't care about the clarity, but cream of tartar leaves an ash residue. Any ash is bad for bees because it can cause honey bee dysentery. When beekeepers started using candy recipes for making bee supplements, many left the cream of tartar in the recipe. It was left there without much thought about its purpose. So basically cream of tartar in "bee candy" is just an artifact remaining from "people candy" recipes.

Since we don't know if it causes harm, and since it doesn't appear to be a part of the honey bees natural diet, why give it to them? So the sugar cakes are gritty—so what? I've never heard a bee complain about gritty-textured candy and I've never seen a bee push away from the table when presented with it.

The only reason one can postulate as to why cream of tartar might be at all harmful relates to the formation of hydroxymethylfurfural (HMF). HMF is known to be toxic to bees, and its presence in high-fructose corn syrup (HFCS) is the reason some recommend against feeding HFCS to bees. There is some suggestion that the potassium in Cream of tartar is also not good for the bees.

Apple cider vinegar is one of nature's natural antibiotics. It does not harm the bees, and some studies indicate that it may actually ward off foulbrood. It acts as the acidic catalyst to foster the inversion of sucrose to fructose and glucose. Apple cider vinegar seems to be the best choice.