

How to Bake the Perfect Cheesecake Every Time

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This cheesecake is not cooked in the center. This cheesecake is over-cooked and has cracked. This cheesecake is just right. Why can't I bake the perfect cheesecake every time? I use the same recipe and carefully measure and add all of the ingredients the same way every time. I have even made sure the bake time is the same and the oven is at the correct temperature, but the results are not always the same. Sometime it's the perfect cheesecake, but other times the cakes are under or over cooked. Why?

The problem does not lie in the oven or your recipe. Variation lies in the small differences in the thermal properties of the cream cheese. Dairy products like many other ingredients and foods vary slightly from lot-to-lot, season-to-season, and supplier-to-supplier. The important thermal properties are: thermal conductivity (k) and thermal diffusivity (D). Simple definitions are as follows: Thermal conductivity ($k - W m^{-1} °C^{-1}$) is the ratio of heat flux density to temperature gradient in a material. It measures the ability of a substance to conduct heat. Thermal diffusivity ($D - mm^2 s^{-1}$) is the ratio of thermal conductivity to specific heat. It is a measure of the ability of a material to transmit a thermal disturbance.

The importance of thermal conductivity is to predict or control the heat flux in food during processing such as cooking, frying, freezing, sterilization, drying or pasteurization. It is necessary to ensure the quality of the food product. Thermal diffusivity determines how fast heat propagates or diffuses through a material. It helps estimate processing time of

canning, heating, cooling freezing, cooking or frying. Water content, temperature, composition, and porosity affect thermal diffusivity. These properties are necessary for calculating energy demand for the design of equipment and optimization of thermal processing of foods (Polley et al., 1980).



Figure 1 The perfect Cheesecake will be cooked evenly through the middle, without cracking at the surface.

To bake the perfect cheesecake every time, you need to measure the thermal properties on every batch of cream cheesecake batter using Decagon's KD2 Pro. Using these thermal properties values, the optimal cook time or belt speed can be determined to bake the perfect cheese cake every time. No more uncooked centers or dry, cracked cakes.