



Pineapple Science Teacher Backgrounder



Pineapple contains a compound called bromelain, which contains two enzymes capable of digesting proteins called proteases.

Gelatin gets its structure from long chains formed out of the protein collagen when the gelatin cools. The gelatin molecules form a network that traps water, which results in a gel. Since pineapple bromelain digests protein, when the pineapple meets the gelatin, it begins to eat away at the collagen proteins in the gelatin. This causes the long protein chains to collapse, making the gelatin watery and not allowing it to set.

Expected Results: The gelatin with the pineapple in it gets very watery and does not set properly, while the gelatin in the other bowl gets firm. A quarter will sink into the liquid in the pineapple gelatin, but it will sit on the top of the gelatin in the plain gelatin bowl.

Fun facts:

- Canned pineapple doesn't have the same effect because heat from canning inactivates the enzymes. The enzymes in bromelain are inactivated once they have been heated to 158F (70C).
- Papaya, mango, guava, mango and kiwi all have enzymes that prevent gelatin from setting. The enzyme in papaya is called papain, and the enzyme in kiwi is called actinidin.
- While these protein digesting enzymes aren't helpful when making gelatin, they are helpful when it comes to tenderizing meat! Meat wrapped in papaya leaves is softened by papain from the papaya.