

# **Impact of Tea Fermentation and Storage Temperature on the Formation of Tea Cream**

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Tea cream formation in the tea industry is a significant problem which can be accelerated during storage. Tea cream is the hazy precipitate that forms due to complex interactions and is highly undesirable to consumers due to the loss of clarity and polyphenol compounds, organoleptic properties, and other health promoting agents. The objective of this study was to evaluate how the fermentation time and storage temperature affected the tea cream formation in tea infusions through chemical and physical testing methods. Five tea infusions with different fermentation levels, Green 0%, Oolong 20%, Oolong 40%, Oolong 60%, and Black 80% were brewed then placed under three stages of filtration under a vacuum. The five tea infusions underwent chemical and physical methods including Folin, Biuret, HPLC, turbidity, and weight. The teas were then stored for fifteen hours at 2.4°C and -18°C to facilitate tea cream formation. The tea infusions were then centrifuged and the same tests were performed on the supernatant in order to determine loss from the tea cream. The turbidity of the tea infusions increased from Green 0% to Black 80% while the samples stored at -18°C had a higher turbidity than those stored at 2.4°C. Overall, the turbidity of both storage conditions increased significantly from the fresh samples on day zero. The total polyphenols, protein, and caffeine all followed the same pattern with a decrease when stored at 2.4°C and a greater decrease at -18°C. Overall, the results showed when tea is stored at -18°C, the complex interactions are accelerated, increasing the amount of tea cream formed compared to storage at 2.4°C. The results help the industry to understand the limited knowledge of the tea creaming reaction at different storage temperatures and its affects on the polyphenol compounds, organoleptic properties, and other health promoting agents.