

# **EFFECT OF BLACK TEA ADULTERATION ON QUALITY PARAMETERS OF BLACK TEA**

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## ABSTRACT

Black tea is a type of tea produced by withering, rolling, fermentation and drying from the tender shoots of varieties of the species *Camellia sinensis* (L.) (ISO 3720, 2011). Black tea adulteration is a particularly massive problem because of the universality of its consumption. Since black tea is a pure beverage material, it should be free from extraneous matter, added colouring matter and harmful substances. But sugar, ferrous sulphate and sodium bicarbonate are added majorly to black tea during manufacturing to improve colour of tea particles and weight of tea. This study was carried out at Sri Lanka Tea Board to investigate the effect of major adulterants on quality parameters of black tea. Black tea manufacturing was carried out in Uva medium black tea manufacturing factory following general requirements and steps (withering, rolling, fermentation and drying). 50% sugar, 10% sodium bicarbonate and 10% ferrous sulphate solutions in mass fraction were treated separately to first dhools as adulterants after rolling and kept it for fermentation. Adulterated black tea samples and pure black tea samples were analysed for following quality parameters such as total polyphenol content, moisture content, total ash, water soluble ash, alkalinity of water soluble ash, water extract, total plate count, total liquor colour and brightness. These quality parameters were analysed according to the ISO 3720 method, SLS 516-1 method and spectrophotometric method described by Robert and Smith (1963). Externally added sugar, sodium bicarbonate and ferrous sulphate significantly affected ( $p < 0.05$ ) on given quality parameters except for moisture content. Sugar adulteration leads to rapid growth of microbial colonies over one month of production (1317 cfu/g). It may be due to, sugary outer layer of adulterated tea particles help microbes to rapid growth on the tea particles during storage. Sodium bicarbonate adulteration resulted highest alkalinity (3.26 %) of black tea which is beyond the ISO 3720 limit for black tea (1-3 %). This may be resulted in formation of alkaline substances by externally added sodium bicarbonate. Adulteration of black tea by ferrous sulphate led to reduction of total polyphenol content (8.81 %) which is beyond the ISO 3720 limit for black tea (minimum 9 %). It may be due to localization of polyphenols with iron by formation of Fe-polyphenol complex during fermentation step. Present study clearly highlighted that adulteration of black tea by sugar, sodium bicarbonate and ferrous sulphate result poor quality black teas with blackish appearance of tea particles and dull liquor colour.

**Key words:** *black tea, adulterants, total polyphenols, alkalinity, poor quality black tea*