

# The effect of roasting conditions before first crack on the quality of coffee.

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## Outline

- 1、 Introduction
- 2、 Materials and methods
- 3、 Result
- 4、 Conclusion

## Abstract

Most of coffee flavors are developed during the roasting process, which is the most crucial step in the coffee bean processing. The roasting process determines the taste and aroma that the barista aims to present. In the coffee industry, roasters consider the phenomenon known as the "first crack" to be a crucial indicator during the roasting process, alongside controlling time and temperature. This "first crack" occurs when there is a significant phase change in the internal composition of the beans, and it serves as an important milestone during roasting. The purpose of this study is to examine the impact of controlling different pre-first-crack roasting conditions on the quality of roasted coffee beans. To prevent the influence of roasting degree and extraction rate on subsequent experiments, Agtron and TDS values were standardized. Analysis of  $L^*$ ,  $a^*$ , and  $b^*$  values using a colorimeter founded that the  $L^*$  value decreased with the extension of roasting time. The average pore area was found increased with the extension of roasting time by the results of SEM. Through analysis of pH values and titratable acidity, it was found that pH values increased with prolonged roasting time, which was related to the results of organic acid content. Regarding organic acid content, it was found that coffee roasted too long or too short resulted in reduced levels of citric acid, malic acid, and Succinic acid. Sensory evaluation of samples revealed that appropriately shortening the roasting time could enhance the flavor. A shorter roasting time could bring out the fruit and berry flavors in the coffee beans. PCA analysis of the electronic tongue data showed that different roasting conditions had a significant impact on the flavor of the coffee. In summary, appropriately adjusting the roasting time before the first crack can effectively increase the content of organic acids and enhance the flavor.