

precursors to flavor components

Chuan Lee, Pei-chun Liao, Cho-chun Huang, Denny Ng, Kai Xia

CH Biotech R & D Co., LTD., Nantou City, Taiwan

Introduction

It has been reported that during processing the coffee seeds initiated germinating related metabolism that could result in different flavor[1]. Flavor precursors can be completely transform to flavor components only if the seed vigor is maintained. So in this research we tried to manipulate the germination of the seeds during processing and see how it correlated with cup quality. We also developed a new method of processing that could highly maintain seed vigor.

Materials/Methods

Coffea arabica L. samples were harvest at Chiayi, Taiwan. Fully mature cherries were de-pulped and fermented for 24 hours at 25° C and then washed with clean water. Washed coffee beans then divided into four batches, first batch directly dried under 40° C, the other third batches immersed in 100 ppm GA for 2 hours and kept moist for 3, 6, and 10 day to promote germination and then dried under 40° C until water content reached 10~12%. Soluble sugar and organic acids was analyzed using UPLC and HPLC.

New post-harvest techniques: Fully mature coffee cherries were slowly dried under 10~15° C until water content reached 10~12%. Same batch of coffee cherries processed by farmers as control group. Viability test modified Hilst's method[2]. Coffee cupping followed SCA cupping Standards.

References:

[1] Selmar et al., *Plant Biol.*, 2006, DOI: 10.1055/s-2006-923845 [2] Hilst et al., *Journal of Seed Science*, 2016, DOI:10.1590/2317-1545v38n3162923

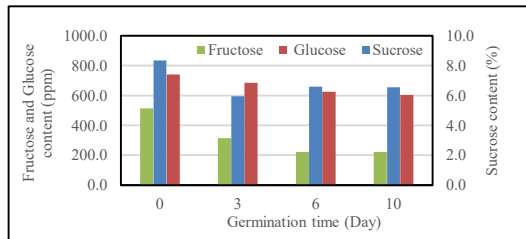


Figure 1: Changes in sucrose, glucose and fructose content during germination in green coffee.

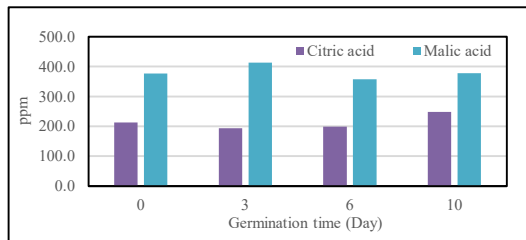


Figure 2: Changes in citric acid and malic acid content during germination in green coffee.

Conclusion/Perspectives

This results suggested that promoting germination at certain degrees would improve cup quality. In our results, the best timing was when glucose and fructose about to decreased in the seed, and malic acid, which is an important intermediate of Krebs cycle, increased. So, the intensity of germination is related to coffee quality and it is important to keep the seed viable to ensure germination related metabolism can proceed during post-harvest processing. Our new techniques of processing can maintain seed viability and improve coffee flavor.

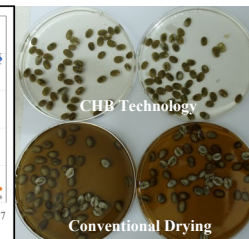
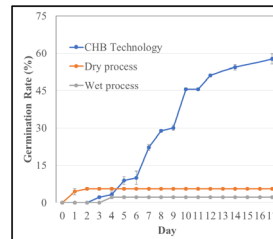


Figure 3: Differences in seeds germination rate and viability between CHB and conventional processing method.

Results/Discussion

GA treated samples with 3 days of germination time had better cup quality (82.75); the control batch had the lowest cupping score (80.50); germinated for 6 days and 10 days both had the score of 81.50. Sucrose content dropped when germination begin, glucose and fructose reached highest level at fermentation stage and decreased with germination time. Malic acid content was highest at the third day of germination. Viability of coffee seed was significantly increased using low temperature drying method compare to seeds dried under conventional drying condition (35~40° C). The cup quality (84.25) was also better than control (81.25).