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EXPLORING THE EFFECT OF FERMENTATION TEMPERATURE AND DURATION ON SENSORY CHARACTERISTICS OF DRY PROCESSED COFFEE

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Introduction

Kenya produces largely Arabica coffee, which is mainly fully washed with a small proportion of naturals, commonly known as buni. As consumer preferences shift toward unique and diverse coffee flavour profiles, there is growing interest in alternative post-harvest processing methods. Natural coffee processing has gained prominence for its ability to enhance flavor complexity and sustainability (Juarez de Sousa e Silva *et al*. 2021). This study therefore explored the impact of fermentation temperature and duration on sensory attributes of dry processed coffee.

Photo 4: Cupping coffee at KALRO-CRI Cupping Lab

1:Mean sensory variables of coffee fermented at different temperatures for five days

Day	FC	F/A	Flavor	AT	Acidity	Body	Balance	Overall
1	Amb.	7.70a	7.65a	7.55a	7.45b	7.75a	7.65a	7.55b
	18°C	7.85a	7.85a	7.70a	7.85a	7.85a	7.80a	7.85a
	35 °C	7.75a	7.75a	7.60a	7.70a	7.70a	7.75a	7.75a
2	Amb	7.75a	7.80ab	7.80a	7.80a	7.75a	7.75ab	7.80a
	18°C	7.60a	7.60b	7.60a	7.65a	7.60a	7.60b	7.70a
	35 °C	7.75a	7.95a	7.70a	7.80a	7.75a	7.85a	7.95a
3	Amb	7.80a	7.65a	7.65a	7.70a	7.80a	7.65a	7.80a
	18°C	7.80a	7.75a	7.65a	7.80a	7.80a	7.75a	7.70a
	35 °C	7.80a	7.70a	7.55a	7.60a	7.70a	7.45a	7.65a
4	Amb	7.85a	7.90a	7.85a	8.10a	7.95a	7.90a	8.05a
	18°C	7.65a	7.55b	7.60a	7.50b	7.80a	7.55b	7.60b
	35 °C	7.90a	7.90a	7.75a	7.85a	7.80a	7.85a	7.80b
5	Amb	7.80a	7.90a	7.90a	7.90a	7.95a	7.85a	7.85a
	18°C	7.80a	7.85a	7.85a	7.85a	7.85a	7.80a	7.90a
	35 °C	7.70a	7.75a	7.65a	7.75a	7.75a	7.75a	7.70a

Means along a column for a specific day and variable not sharing a letter are significantly different (P<0.05). Student-Newman-Keuls (SNK5%) test. *KEY- FC-Fermentation condition; Amb-Ambient F/A- Fragrance and aroma; AT-Aftertaste*

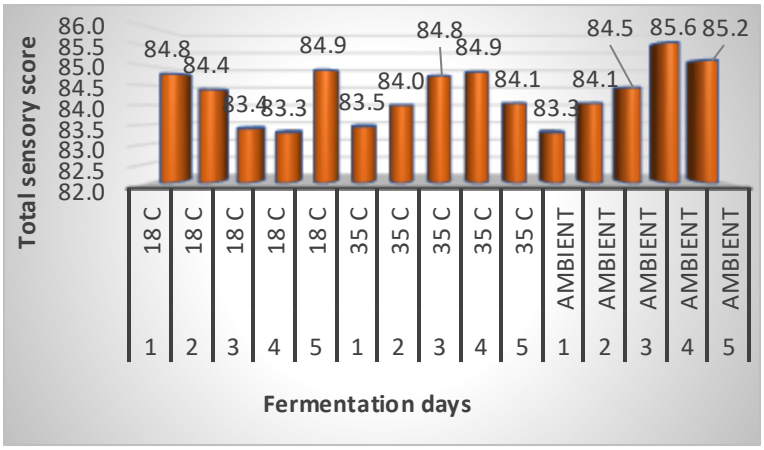

Figure 1: Total sensory score of coffee fermented at different temperatures

Materials/Methods

Red ripe coffee cherries were harvested at the KALRO Coffee Research Institute farm in Ruiru. After sorting (Photo 1) the cherries were fermented (Photo 2) at 18°C, Ambient and 35°C, for five days under anaerobic conditions and dried (photo 3). Sensory evaluation procedure described by Lingle (2001) was applied and coffee was cupped by 5 sensory judges (photo 4). The variables evaluated included - Fragrance/aroma, flavour, after-taste, acidity, body, balance, clean-cup uniformity, sweetness and overall, which were computed to total sensory score.

Photo 1: Sorting

Photo 2: Fermenting

Photo 3:Drying

Results/Discussion

The cup quality profiles of the coffees under the different fermentation conditions are shown in Table 1. Each temperature condition (18°C, ambient and 35°C) had a distinct sensory trajectory over the five day. Within the five days some significant differences (P<0.05) were observed in the sensory variables especially flavour, acidity, balance and overall. The lower temperature (18°C) showed relatively stable but lower sensory scores probably due to lower microbial activity and reduced metabolic diversity. Fermentation at **35°C and at** ambient temperatures yielded high scores consistently with a peak at day 4.

All the coffees attained specialty grade (80 points and above) with coffees fermented at ambient and 35°C, attaining the highest total sensory score at day 4 (Figure 1).

Conclusion/Perspectives

This study demonstrates that both fermentation temperature and duration significantly influence the sensory characteristics of dry processed coffee. The results suggests that farmers can still ferment cherry under natural environmental conditions and get desirable flavour profiles.

References:

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