

STANDARD COFEEE PROCESSING PROCEDURES



1.0 INTRODUCTION

Processing is a major activity that affects quality. There are basically two methods of coffee processing - the wet method and the dry method. The wet method gives better quality and is predominantly used in Kenya. This involves a series of stages as discussed below.

2.0 STAGES IN COFFEE PROCESSING (WET METHOD)

2.1 Cherry Picking

- Only red ripe cherry should be picked.
- Picking containers should be clean to avoid contamination.
- Fallen rotting cherries should not be picked from the ground.
- Keep picked cherry under shade to protect from intense heat.

2.2 Cherry Sorting

- Clean the sorting area to remove the remains of the previous cherry sorting.
- Remove dry, green or pest damaged berries, twigs and leaves

2.3 Pulping and pre-grading

- Adjust machinery to avoid nipping of parchment as this may open avenues for mould growth/ oxidation and onion flavor.
- Pulp cherry the same day of picking. Delayed pulping causes premature fermentation, hence foxy beans which lowers quality.
- Pulping machinery should completely separate;
- Parchment and pulp to avoid crop loss.
- The various parchment grades properly for uniform fermentation. uneven fermentation leads to unfavorable odours due to fungal infection.

2.4 Fermentation

- Is the process of breaking down the thick mucilage layer on the parchment into simple non-sticky washable substances (sugars).
- Drain water used for pulping to enable dry fermentation.



Plate 1 Cherry sorting



Plate 2: Pulper and Pre grader

- Optimum conditions for fermentation (dry)
 - Parchment pH 5.5 - 6.0
 - Temperature: 30 - 35°C
 - High natural enzyme concentration inherent from re-circulated water.
- The period of fermentation depends on the prevailing weather conditions.
- Check if fermentation is complete by washing a few handfuls of parchment in a bowl of water and rubbing between fingers. fermentation is complete if parchment feels 'gritty' when rubbed

between fingers.

- The fermentation procedure should be 'dry', followed by intermediate washing (after about 16 hours or so), then 4 to 6 hours of further dry fermentation if necessary . These two steps ensures the quality of both the overripe and the red cherries. After the gritty feel is achieved, wash the parchment and soak overnight.
- Depth of parchment in fermentation tanks should not exceed 1 m.
- No beans from previous pulping should be left in the fermentation tanks as this may lead to formation of 'stinkers' which lowers quality.



Plate 3: Wet parchment in fermentation tank

2.5 Intermediate washing

- This is normally done approximately 16 hours after pulping.
- The Parchment is washed in the fermentation tanks to remove the degraded mucilage and the water drained to allow fermentation to continue if necessary.
- If fermentation is complete, the parchment can then be soaked overnight without further dry fermentation. If not, allow further dry fermentation until the gritty feel is achieved; probably till the following morning when only Parchment 1 (P1) need be soaked. However, Parchment 2 (P2) may also be soaked if facilities allow.
- In extremely cold weather, it is preferable to continue dry fermentation

without intermediate washing until fermentation is complete unless there are overripes in which case it becomes necessary.

- Use wooden or non-abrasive material for stirring and intermediate washing to avoid injury of the parchment skin.
- Strictly observe personal hygiene.
- Use clean water.

2.6 Under Water Soaking

- This is done to improve parchment colour and ease factory pressure when there is no space on the drying tables.
- Parchment is thoroughly washed in the fermentation tank and then fully immersed under clean water.
- The water should be changed after every 16 - 24 hours.

2.7 Final Washing and Grading

- This is done to remove any adhering dirt or remains of mucilage.
- The parchment is pushed against a stream of water to clean it and grade it more efficiently on the basis of density into parchments grades 1, 2, 3 and lights.
- Personal hygiene should be observed (parchment at this stage is known to pick foreign odors which are detectable at the cup).

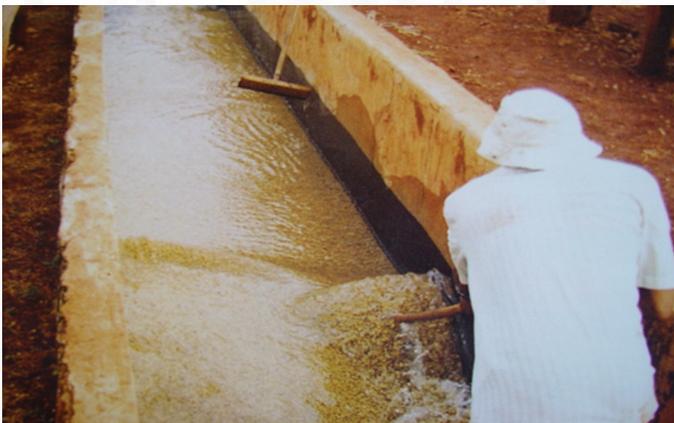


Plate 4: Final Washing and grading

2.8 Parchment drying

This process reduces the moisture content of coffee beans from about 55% moisture content after washing to 11.0 – 10.5% moisture content which is safe for hulling, storage and roasting. It has several stages;

I. Skin drying (55 – 45%) Moisture Content (M.C) : Removal of surface water.

- Execute the skin drying within the shortest time possible. Less than a day
- Transfer parchment to the final drying tables on the same day. Don't leave it overnight.
- Parchment depth should be a maximum of 1 inch (2.5 cm).
- Sort out the defective beans since they are easily distinguished during the skin drying stage.
- Maintain the tables in a clean condition and absolutely flat for even drying.

II. White stage (45 – 30% M.C): Whitish beans, prone to cracking.

- Practise 'slow and cool drying' during the white stage for 2 – 4 days to avoid cracking.
- Ideally, a raised shade cover should be used to allow free air movement.
- Else, for early morning and evening, spread out the coffee in a thin layer, (1 inch deep) and stir constantly. In the hot part of the day, pile coffee in a ridge 4-5 inches deep along the centre of the table and stir constantly.
- In dull weather, the coffee may safely be left uncovered for longer periods
- Parchment depth should be a maximum of 1 inch (2.5 cm)
- Undertake sorting since defective beans are still visible at this stage.
- Use suitable drying and waterproof covering materials while allowing ventilation from beneath

- Towards the end of this stage, fatty acids, cafestol and kahweol are formed in the bean which play part in the formation of the desirable bluish and greyish colours of the raw beans.

III. Soft Black stage (30 -20% M.C): Elastic, soft and translucent beans

- Sunlight is very essential, final bluish green bean colour is formed at this stage. Mechanical drying not recommended
- Expose to sunlight at least for 2 days (≥ 50 hr sunshine) to improve bean colour.
- Drying depth should be 2.5 cm, but may be increased to 5.0 cm.
- Temporary storage in well ventilated bins is permitted (to ease congestion at the drying tables).

IV . Medium Black stage (20 – 16 % M.C): Fairly hard beans

- Parchment can be dried rapidly without loss in quality using either the sun or mechanical driers
- The parchment can also be heaped safely to a depth of 5 cm.
- In case of congestion, the parchment can be stored temporarily in ventilated bins to create space and be taken out later for final drying.
- Time taken is variable depending on weather.

V . Hard black stage (16 – 11% M.C): Fully hard beans

- Can be dried rapidly without loss in quality
- Mechanical drying can be done if there is limited drying space.

Note: Avoid collecting any fallen parchment as this introduces earthy flavor.

2.9 Conditioning (11– 10.5% M.C)

- Conditioning is done in ventilated stores or bins. At this stage the beans are dry and cannot suffer any quality loss if the relative

humidity is maintained at 60%.

- Avoid over drying parchment to safeguard against fading and moisture re-absorption during storage.

3.0 DRY PROCESSING - Buni drying

- Dry on coffee tables (tray wires or plastic nets; NOT sisal cloth) or on clean cemented raised surfaces.
- Completely protect from water to avoid rewetting
- Dry coffee harvested on different days separately
- Start drying immediately after harvesting.
- Never heap but instead control the thickness of the drying layer complemented with regular turning.
- Moisture content (M.C) of dry Buni should be a maximum of 12%

4.0 STORAGE AND TRANSPORTATION

4.1 Storage

- Construct stores as per recommended designs to allow ventilation and avoid rewetting.
- Use clean gunny bags for storage.
- The roof must also provide adequate insulation in order to minimise heat transfer.
- Use wooden pallets at a minimum of 6 inches away from floor and wall.
- Do store chemicals in parchment stores.
- Do store coffee for more than 3 months after drying.

4.2 Transportation to Mills

- Containers (Lorries) must be clean before parchment is loaded
- Use only clean gunny bags for transporting parchment coffee.
- Avoid rewetting and dust contamination by covering with canvas during transportation.
- Use shortest time possible to transport parchment to mills.
- Do not load coffee with other goods.

- Clean containers before loading parchment Do store coffee for more than 3 months after drying.

5.0 MANAGING WEATHER CHANGES

- In cool dull weather, concentrate on drying the wettest coffee.
- Nearly dry coffee (Medium black stage or soft black stage) can be placed in well ventilated stores to release drying space for wet coffee.
- Do not forget to bring this coffee out again when drying conditions improve.
- Further, soaked parchment can be delayed in the soak tanks for a few days without loss of quality as long as clean water is used and changed daily.
- In hot, dry weather, remove dried coffee from the tables while it is still cool but avoid over drying.

6.0 FACTORY HYGIENCE AND ENVIROMENTAL CONSERVATION

- Clean the pulping machine and the cherry hopper after every pulping session
- The waste water must be effectively contained in seepage pits to preserve the natural environment
- Composting coffee pulp and its eventual usage in farms will help to alleviate environmental pollution.

7.0 HIGHLIGHTS ON GOOD MANUFACTURING / HYGIENIC PRACTICES

- Document all incoming cherries, dates and other activities.
- Location should be environmental friendly, easy to clean and accessible
- Observe personal hygiene and overall factory sanitation.
- Use clean water and have a re-circulation system.
- Re-circulated water must be disposed off after use.
- Determine various factories capacities.

- Fermentation tank should be free of cracks to avoid mould growth from left over beans which leads to stinkers.
- The fermentation tank should be well painted with acid resistant paints.
- Fermentation can be accelerated by the use of peptic enzymes, intermediate washing and use of re-circulation water during pulping.
- Fermentation is complete when the parchment ‘feels gritty’ and is no longer slippery when rubbed between fingers.
- The drying parchment should not fall on the grass or bare ground. Do not collect the fallen ones.
- Any vegetation growing under the drying beds should be removed to enhance aeration.



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