



# Fruity, Fermented, and Everything in Between

How coffee processing  
affects your cup  
(Part 2 of 2)

Story and pictures by Willem J. Boot

IN PART ONE of this series, we took a broad look at different steps in the cherry-to-green-bean process. Once you have a clear understanding of the process itself, it's helpful to look at the role that processing plays as a whole in the coffee industry, as well as to learn more about the processing tools (such as the mechanical mucilage remover) and production styles (such as the semi-washed process) which have gained popularity in the last 10 years.

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Some people might wonder why a roasting company should even be involved at all with processing issues. Why would a roaster be concerned about producer problems if all the green coffee is supplied by one or more reliable importers or brokers? In my opinion, specialty and institutional roasting companies need to be extra-concerned about green coffee quality, especially because I have noticed an

increasing complacency among established brokers and importers about important quality parameters like coffee production styles and their impact on flavor.

Coffee processing involves at least seven critical steps and the outcome of this process will obviously determine the overall performance and the market success of the producer and the farmer. The better the performance of the producer, the more

quality this brings into the hands of the roaster. Roasters who want to establish direct relationships with producers are strongly recommended to visit some wet and dry mills beforehand since this will elevate their knowledge about coffee processing styles in general. Expanding your knowledge about coffee processing will help you make better purchasing decisions and will improve the quality of your roasted beans.

Interestingly, roasters already seem to be taking this on. There is a rising trend in the roasting community to reach beyond the desk of the importer and travel to origin countries. By establishing direct relationships with producers, roasters seem to be able to compensate for any lack of transparency and traceability in the existing coffee supply chain. Roasters are also traveling to origin out of a desire to be involved with the actual cherry-to-green-bean process; this seems to be an effective tool to improve and maintain quality over time.

### Direct Relationships Between Roasters and Producers

The staggering number of coffee tours, cupping events and conferences in producing countries contributes to a higher level of understanding between producers and roasters about each other's requirements and expectations. For the producer, these new relationships offer the unique opportunity to improve their management practices at the farm and at the mill. For the roaster, there are also various benefits. First, a direct relationship with the coffee producer allows roasters to directly express the proprietary quality requirements and to be very specific about their own quality needs.

Jim Cleaves, coffee excellence manager for Dunkin Brands, explains the Dunkin coffee principles and how they are applied to the relationships with exporters and millers. "Build the quality in, don't search for it later," he says. "Move further down into

the supply chain, closer and closer to the producer, and do a better job communicating what you're looking for in the language that the producer speaks. The net result: once the product comes out of the dry mill it is more likely that it will have the quality built in."

This approach to coffee procurement is not new in the coffee industry. Larger coffee companies like Starbucks have been dealing directly with producers for many years. How about the smaller players? Do they go the extra mile to reach out to producers and reap some of the benefits that can evolve from the direct relationship? Absolutely. Coffee buyers of avant-garde coffee roasters like Intelligentsia, Terroir, Tony's Coffee, Ecco Caffè and The Golden Coffee Box (run by my brother Barend Boot) travel the globe to discover the jewels of coffee in countries like Brazil, Ethiopia, Kenya and Colombia.

With this ongoing renaissance in coffee relationships, I have noticed that roasters and producers are becoming more sophisticated about refining coffee processing styles with one common objective: optimizing flavor.

### Experimenting With Styles

One of the results of this closer relationship and the education that comes with it, is that many growers are now experimenting with different processing styles.

Why would the producer process coffees in different ways using different methods? What is the objective? Foremost, the producer's purpose is to please the customer and if he can do this process again and again, without major flavor variations, then the experimentation can bring major benefits, provided that there are customers who are willing to pay a decent price.

Today's avant-garde specialty roasters seem very interested in exploring the various processing styles. Daniel Peterson of Finca la Esmeralda in Boquete, Panama explains his viewpoint of utilizing different processing styles for his coffees. "I like

to experiment; it is fun and adds different perspectives to understanding the complex flavor of coffee," he says. "On top of that, we see that the interest for alternative processing styles is growing."

It isn't just the roaster-grower relationships that are bringing about these changes in processing styles. New equipment, such as mechanical mucilage removers, are offering new ways to process

and, thus, creating new flavors in the cup.

Experimenting with processing styles isn't something to be done lightly, however. There is still much we don't know about how processing affects the cup. And in many cases, one failed experiment could mean a failed season and a financial loss for growers. Obviously, it is imperative to

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## PROCESSING STYLES FROM EXPERIMENTATION TO TASTING

RECENTLY, I CUPPED and compared some different processing styles in Panama and the outcome was very interesting. The tasting session featured three different coffees, each processed in different ways. The table below shows the outcome of the tasting session and my flavor impressions.

The caturra, chinta coffee produced the highest score using a semi-washed process while the variety blend, lina performed best using the fully washed process with a mechanical mucilage remover.

Last but not least, the famous geisha, jaramillo coffee tasted best with the semi-washed process, which highlighted best the perfumy floral aromatics and the tamarind, citrus flavor profile.

### PANAMA TASTING, DECEMBER 2006

#### Caturra, Chinta – 1600m

Process	Tasting notes	Score
Washed process, traditional mucilage fermentation	Floral aroma, thick body, clean acidity	87
Washed process, mechanical mucilage removal	Good fruit in aroma and flavor, clean aftertaste	86
Semi-washed process, no fermentation, and dried with mucilage	Fruity aroma, elevated acidity, refreshing and fruity aftertaste	89

#### Variety blend, Lina – 1650m

Process	Tasting notes	Score
Washed process, traditional mucilage fermentation	Dry fruit aroma, chocolate tones, lacks overall attributes	85
Washed process, mechanical mucilage removal	Complex floral aroma, thick body, clean acidity, lingering and clean aftertaste	87
Semi-washed process, no fermentation and dried with mucilage	Floral aroma, dry aftertaste, becomes more fruity while time evolves, fruity notes lack balance	82

#### Geisha, Jaramillo – 1550/1600m

Process	Tasting notes	Score
Semi-washed process, no fermentation, and dried with mucilage	Floral and typical geisha characteristics with silky mouthfeel, sweet fruit notes, and lingering floral aftertaste; still lacks the elegant fruit notes due to lack of reposo	92
Washed process, mechanical mucilage removal	Milder aromatics with citrus undertones, pleasant floral characteristics, mild geisha characteristics with clean citrus aftertaste	88

design well-controlled experiments and to apply strict tasting protocols before we can successfully improve or change coffee flavors by applying a different processing style.

### Mechanical Mucilage Removers

Let's discuss some technical issues about different processing styles by reviewing an innovation that has taken the coffee processing world by storm over the past ten years: mechanical mucilage removers. Nowadays, at least 35 percent of coffee produced in Latin America is processed using mechanical mucilage removers. The Spanish word for these machines is almost impossible to pronounce: *desmucilagador* (thes-moo-see-la-gee-na-door).

This machine literally rubs the mucilage off the parchment bean, producing a slick, honey-like mass that consists of densely concentrated mucilage. Many cuppers are still wary of mechanical mucilage removers because of the special flavor benefits that they believe are solely a result of traditional fermentation processes. Some of these critics do not believe that the mechanical remover protects the integrity of the coffee bean and they doubt that the coffee flavor comes out as was meant by Mother Nature. Even growers are unsure of the results. "I'm not going to play God on this issue," says Peterson. "We have to do more cuppings and the jury is still out on that key issue."

So, how about the fermentation process of coffee? Does it add flavor to the beans and complement the influence of Mother Nature? Or is this just an old concept supported by conservative coffee professionals who would rather reject any change in production styles?

I must conclude from the recent trial and tasting sessions in Panama (see sidebar, left) that there seems to be no consistent positive correlation between final cup quality and the applied process of removing the mucilage. The outcome of the last three "Best of Panama" cupping competitions supports this conclusion. The experiment with the geisha, jaramillo coffee even seems to suggest that, for certain coffees at least, it could be preferable not to remove the mucilage at all, a processing style we will discuss shortly.

As suggested before, in my investigations over the years, I have not

been able to find any conclusive evidence that points towards a predictable positive correlation between the final cup profile and the fermentation process. Obviously there are plenty of possibilities where the traditional style has a negative impact on final cup flavor. For example, catastrophic stinker defects can occur if the fermentation is taken too far. In this case lactic, acetic and propionic acids are formed that allow the growth of molds during the subsequent drying process.

The actual time needed for fermenting the beans depends on various factors, like the ambient temperature, the relative humidity and, last but not least, the temperature of the water that is used for fermentation. Given the fact that there are so many variables at play, with endless opportunities for error, I can only agree with the proponents of the mechanical mucilage remover. My research in Panama, where I interviewed various processors who started experimenting with mechanical mucilage removers more than seven years ago, confirms the argument that the *desmucilagador* does a better job of producing cleaner, taint-free coffee. With traditional fermentation, there is simply more room for human error.

We've all heard horror stories about a crop ruined by this kind of human error. I always think of the story of a Guatemalan specialty coffee mill where the supervisor failed to check the progress of the fermentation process because he fell asleep after a nightly celebration. Despite his fear that the beans might be

fermented a bit too much, the next morning, he started the drying process and prepared the coffee for export. The final result: major financial loss with one entire container of precious specialty coffee wasted and a disappointed client (a roaster in Europe) who rejected the entire shipment.

Still, as I've mentioned, additional research needs to be completed. Many variables affect the outcome of the cherry-to-green-bean process: soil constituents, elevation and climate conditions. The best research protocols should be applied to separate each variable and to investigate the individual impact of, for example, the soil on the final flavor profile using various processing styles and methods.

Even if they can't agree on the flavor effects of this technology,



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most coffee professionals recognize the tremendous benefits of the mechanical process for its minimal impact on the environment. The modern ecological coffee mill of Café Ole in Barriles, Volcan, Panama, only uses nine cubic feet of water per day; all waste water is recycled using innovative basins that effectively filter the water. As a result, Café Ole's mill has almost

zero impact on the environment, which makes this producer an exemplary mill for coffee processing.

### Semi-Washed Coffee

What about the semi-washed process, which, in countries like Brazil, is also called the pulped natural process? Does this production style preserve the "true" flavor of the coffee? Is there really a "true" nature of coffee, or should the producer select the processing method according to the requirements of the client? Semi-washing is one approach where we can play around with answering that question, because it allows a potential range of flavors from the same green coffee beans.

In the semi-washed process, the beans are pulped and, instead of fermenting the beans first, they are immediately dried with the mucilage still attached. The flavor profile of semi-washed coffees is somewhere in between the profile of washed and sundried natural coffees. From what I have tasted with Ethiopian and Brazilian coffees, I can conclude that semi-washed coffees generally have more sweetness, a fuller body and less acidity than washed coffees.

Abdullah Bagersh, a well-known Ethiopian exporter and processor of specialty coffees, explains the benefits of the semi-washed versus the natural sundried process by saying, "Semi-washed is much safer, and more consistent."

However, obtaining the optimal flavor profile with the semi-washed process is not easy, and producers who start practicing semi-washed processes often struggle in the beginning. As it appears, the outcome of the semi-washed process is very much determined by the drying process. Coffees that are dried relatively fast under constant conditions generally taste cleaner and coffees that are dried slower can present more fruit in the cup.

In countries where the processing is normally done fully washed, the fruit flavor can become overpowering

and the coffee will be regarded as fruity, which is often considered as a processing taint. Producing semi-washed coffees can be a dangerous exercise, especially when the producer has little experience with this new processing method.

### Drying Techniques Overview

Now that we have discussed some different processing options, let's summarize some of the various drying techniques as they're used around the world.

The key objective of coffee drying is to bring the moisture content down gradually, with a minimum of intermissions. Consistency seems to be key in proper drying processes. A recent research project by Illy Caffè showed the correlation between inconsistent drying practices of parchment coffee and the formation of two chemical compounds (ethyl isovalerate and

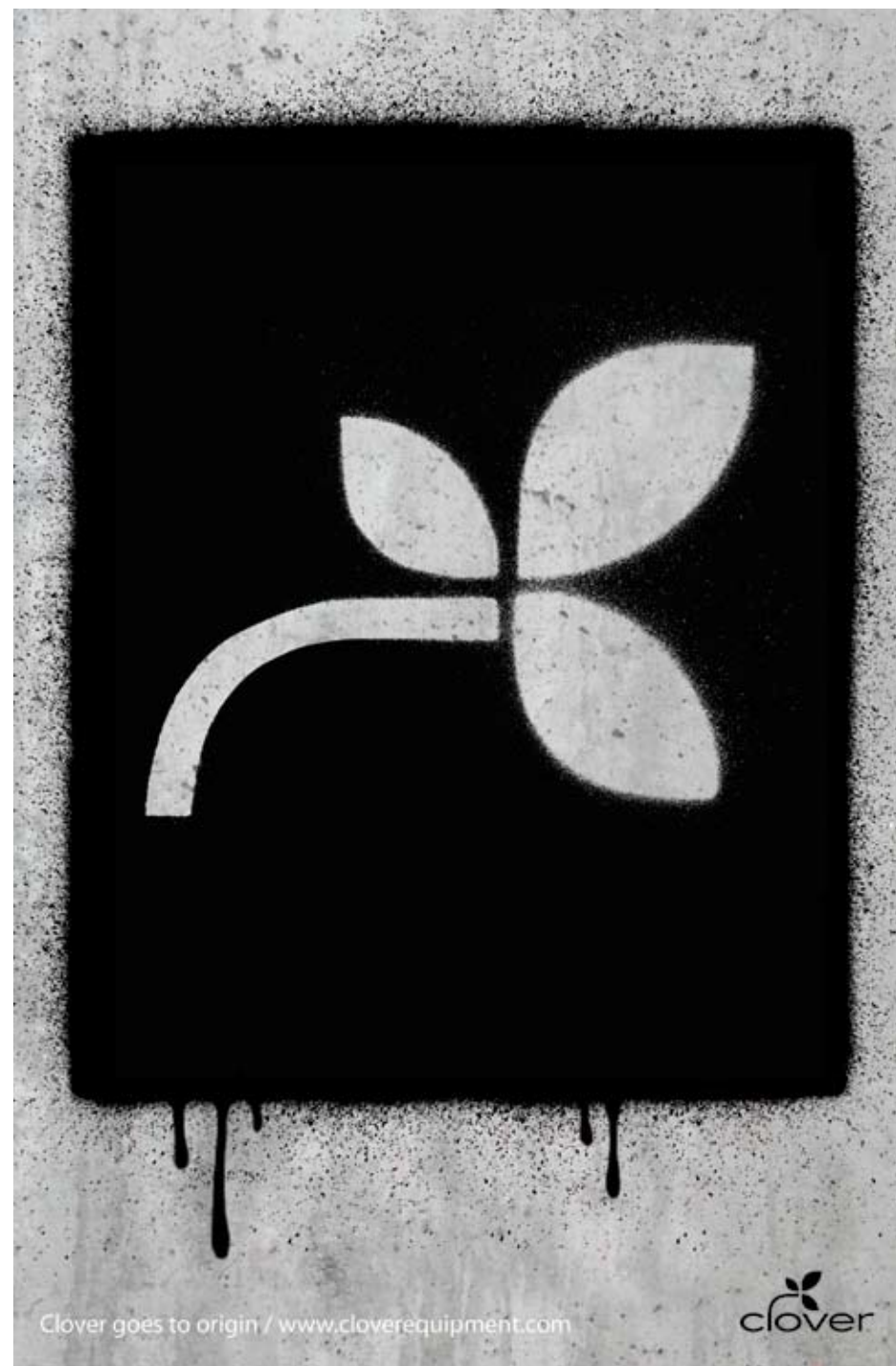
ethyl 2-methylbutanoate), which favor the occurrence of over-fermented flavor taints. The study also showed a correlation between inconsistent drying methods and the occurrence of severe riy taints, which were caused by the development of molds due to the fact that the coffee was dried too fast and inconsistently.

The drying process itself is relatively

costly due to the labor involved and the high investment in mechanical driers or the need for expensive patio space. For this reason, I have noticed that coffee processors are continually trying to improve and upgrade coffee drying techniques.

With traditional patio drying methods, coffee beans are often covered and stored

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outside at night which can lead to swings in the moisture content of the beans due to the varying temperatures and changing relative humidity levels between day and night.

Many processors use the patio for pre-drying and the mechanical guardiola for fine-drying. The solar dryer (using plastic tarps) not only protects the beans from rain, but also facilitates a gradual drying process, leading to a more consistent moisture content throughout the individual coffee bean itself.

A well-calibrated guardiola can provide a solution to some of the inconsistent moisture issues. Some run with a gas burner, which allows the operator to fine tune the temperature inside the drying cylinder. The best guardiolas have air nozzles inside to disperse the hot air evenly throughout the coffee. The African drying beds offer the benefit of air moving freely around the coffee, from above and from below.

With the drying process under control, processors can prevent incidental fruity flavors more easily. Ideally, the pre-drying is accomplished using the patio or a mechanical pre-dryer. This should then be followed by a fine-drying process that applies convection heat at a maximum heat level of 50 degrees Celsius.

### Discussing Fruit Versus Fruity

Recently, I coordinated a cupping event in the Concordia region of Southeast Antioquia, Colombia, in collaboration with Cristina

Garces of Café Montes y Colinas who operates a number of farms and processing mills in the state of Antioquia. The Concordia region has more than 5,000 farmers whose income depends on coffee only. The area has some of the best conditions for the production of quality coffee: excellent elevation (coffee grows up to 2,200 meters), super fertile soils, good infrastructure of mills and, last but not least, dedicated, passionate people who have been growing coffee for many generations.

During the pre-selection cupping rounds and the following international coffee event, we tasted at least 200 different samples from coffee producers who were specifically invited to participate because of their cultivation of heirloom coffee varieties like bourbon, typica, caturra and catuai. The cupping event showed the enormous potential of this relatively unknown Colombian region. The team of experienced coffee cuppers gave some of the highest scores I have ever seen during a competition. As always, the interesting aspect of these tasting events lies in the discussion after each cupping session.

The flavor profiles we discovered included attributes from fruits like *sandia* (watermelon), *guanabana* (an interesting-looking exotic fruit), *maracuya*, and *granadilla*, with the vibrant, refreshing acidity of lime and grapefruit and the unforgettable aftertaste of jasmine and bergamot. The discussion rounds after each session focused on the whys and the hows of some of these compelling flavors and more than once a passionate conversation

evolved about the fundamental differences between the flavor characteristics of “fruit” and “fruity.”

The difference between fruit and fruity brings us to the key question of whether the flavor was predominately created by the influence of Mother Nature or whether the cup characteristics were primarily created at the coffee mill as a result of the applied processing style.

As I see it, Mother Nature produces fruit flavors (as we tasted so often in Concordia, Colombia) and the processing style is responsible for the fruity flavor. As it pertains to fruity, we should then ask an important question and this is where things usually get dicey and controversial: was the fruity flavor an incident or did the producer intentionally create the fruity flavor? Producers who plan for the fruity notes generally allow the parchment beans to dry with some or all mucilage left on the bean. The photo to the right shows parchment beans with the mucilage left on 100 percent (upper row) and left on 25 percent (lower row).

During the cupping competition, our cupping panel encountered at least five controversial coffees where the opinions were quite divided about the essence of the presumed fruity flavor profile. Some tasters would argue that the sugars of the coffee were “over the top” and tainted, while others were impressed with the intense sweet flavors of the same coffees.

One clue to the controversy lies in the actual preparation of the coffee by the end user. Cuppers from companies with dark



roasting styles often tolerate and embrace fruity coffees and I have noticed a similar trend with companies whose business is primarily in espresso drinks.

So, what is my opinion in the fruit versus fruity debate? Personally, I don't agree with those experts who relentlessly reject fruity coffees. My analysis usually focuses on how the flavor profile behaves from the beginning to the end of the tasting

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session. Does the coffee maintain its consistency or are the fruity notes slowly changing? I have tasted fruity notes undergoing—within one cupping session—a metamorphosis from sweet to sour, from a round mouthfeel to a sharp texture. In these cases I would conclude that the fruity flavor is a taint. In cases where the fruity notes are consistent and not pungent, I usually conclude that the fruity notes positively contribute to the overall flavor profile.

Coffee processing, from harvest to drying, is a complicated, ever-changing—and incredibly important—part of the coffee chain. As equipment continues to evolve and our understanding of the process continues to grow, I anticipate that our choices of processing styles will also increase. And, ideally, this means less taints, more flavor variety and a greater control over the bean from start to finish.



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