September, 2020
Issue #7

The Daily Grind

MONTHLY NOTES ON YOUR MORNING CUP

TLJ
COFFEE COMPANY

Coffee Chemistry: Flavor

Coffee chemistry is a complex topic. Not only are there more than 1,000 compounds in coffee that contribute to its taste and flavor, the makeup and proportion of these compounds change during the roasting process. In this issue, we'll take a look at some of the science of coffee's flavor.

The maximum yield of roasted coffee—that is, the percentage by weight of coffee grounds which is water-soluble—is around 28%. Put another way, about four and a half ounces out of each pound of coffee is made up of the oils, sugars, phenols, and acids that give coffee its flavor. There is, however, a sweet spot: between around 18% and 22% extraction yields the best cup. Here's why.

The first compounds extracted from ground coffee during the brewing process are acids. In particular, our light roast coffee contains *chlorogenic acids*, so called for the green color they take on when oxidized. Acidity on its own imparts a sour taste, and requires balance from additional compounds extracted later in the process. This is the lower end of the sweet spot: too little extraction, and the coffee will be sour.

Sugars (more specifically, Maillard products) and coffee oils come next. The sheen on dark roast coffee beans is the oils, boiled out of the center of the beans and condensed on their surface. These oils are responsible for much of coffee's body, and make the difference between a light cup of an African or South American coffee and a heavy Sumatra. The Maillard products, from the same class of sugar-protein reactions that make toast and grilled meat satisfying, are the source of much of the sweetness in light and medium-roast coffee. Their extraction peaks in the 18%-22% range.

Finally, the coffee grounds yield phenolic compounds in larger quantities above 22% extraction. The breakdown products of the chlorogenic acids mentioned above, phenolic compounds contribute most of coffee's bitterness. Dark roasts, which expose the beans to high temperatures for longer, develop more phenols and thus more bitterness.

This Month's Coffee

This is an Ethiopian coffee from the Yirgacheffe region, and in particular a coffee processor in the village (or 'kebele') of Foge. As with many of our coffees, the processor buys raw coffee from farmers in the surrounding mountains, some of which grow coffee at altitudes up to 6,900 feet! The climate in Yirgacheffe is perfect for coffee, between its high elevation, thick vegetation for shade, and moderate wet season. Many Yirgacheffe coffees are organic, not as a statement but because agricultural chemicals are simply unnecessary.

This example, roasted to a light City, appears medium brown when brewed instead of black. Let it cool for a minute or two after pouring a cup! Like many light roasts, its harsher flavor notes quickly mellow as the cup cools, revealing the delicate flavors below. Its brewed aroma is not strongly reminiscent of the beans' scent, with floral and citrus notes taking prominence. Light acidity and very low bitterness round out the cup.

Pictured here is a coffee farm in Ethiopia's Yirgacheffe region. Between Yirgacheffe and the country's other coffee-growing regions, Ethiopia is the largest coffee grower in Africa.