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COFFEE

Growing a Better Decaf

Inside the race to produce a naturally low-caffeine bean

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By JULIET CHUNG

From Madagascar to Costa Rica, farmers, scientists and multinational companies have been racing to deliver an elusive product -- a gourmet coffee bean that's naturally low in caffeine.

Coffee companies have been spending millions of dollars identifying, breeding and, in some cases, genetically manipulating promising coffee varieties. They've rooted through seed banks, assembled teams of agronomists and tasted countless cups of coffee, all in pursuit of what some people call the industry's holy grail, a bean that produces a great-tasting cup of "low-caf."

Italian roaster Illycaffè introduced Idillyum, its low-caffeine bean, in Italy in early October and plans to offer limited quantities in the United States starting Monday. The UCC Ueshima Coffee Co., one of Japan's biggest roasters, has begun selling limited supplies of its low-caf Bourbon Pointu beans in Japan for about \$300 a pound. Brazilian grower Daterra Coffee is selling its Opus I Exotic at a handful of coffee shops around the U.S. as well as to several wholesalers. And the Costa Rica-based Doka Estate, which is owned by the Vargas coffee family, plans to start exporting its own low-caf beans next year for roasting and taste tests, with commercial sales expected to begin in the U.S. in 2011. The company's clients include American chains such as Caribou Coffee and Peet's Coffee & Tea.

Coffee companies have been looking for ways to perk up the \$2 billion decaf business, which has remained flat in recent years. A bean that is naturally low in caffeine but produces complex, flavorful coffee "would be a huge innovation," says Geoff Watts, green-coffee buyer for the Chicago-based specialty roaster Intelligentsia Coffee.

Decaf coffee has long been considered inferior to regular, something that coffee experts attribute to the decaffeination process itself. Typically, coffee beans are steamed open and then soaked in a chemical solution like ethyl acetate, which draws out the caffeine but also flushes away some of the fats and oils that give coffee its aroma and taste. Some decaffeination processes use water processing to remove caffeine.

The new beans have more caffeine than most decaffeinated beans, but up to 50% less caffeine than regular Arabica beans, the type used to make specialty coffees. The low-caf



Ericka Burchett/The Wall Street Journal

A LO-CAF TASTE TEST

We organized a blind tasting of coffee made from three new naturally low-caffeine beans: Daterra's Opus I Exotic; UCC Ueshima's Bourbon Pointu; and Illy's Idillyum espresso. For comparison, we also included a full-caffeine coffee, Intelligentsia's Los Inmortales, as well as the decaf house blend from Stumptown Coffee Roasters, based in Portland, Ore., in the tasting.

Our tasters were Dan Griffin, of New York coffee consultancy Tamp Tamp; Kevin Mahan, managing partner of Gramercy Tavern in New York; Oren Bloostein, owner of New York specialty coffee roaster and retailer Oren's Daily

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Roast; and Steve Colten, a coffee merchant and former president of the Specialty Coffee Association of America.

The new low-cafs were in for a challenge. All four panelists said that as a rule they prefer drinking regular coffee. Mr. Griffin says he routinely tells his café clients not to serve decaf at all. "I drink coffee for the complexity, for the sweetness, for the beauty of the flavor," he says. "With the decaf, it's just not there."

To minimize some of the variables that could affect the quality and taste, we had four of the coffees roasted on the same day, though this was done by four different roasters, and prepared the same way: the beans were ground before the tasting and steep-brewed. The fifth coffee, Illy's Idillyum espresso, had been roasted at an earlier date and was packaged in a pre-ground espresso pod. It was prepared in the Illy coffee maker for which it was designed.

Here are the results, obtained after much slurping and spitting.

Bourbon Pointu



Ericka Burchett/WSJ

pineapple but liked the coffee's acidity. Mr. Griffin thought the coffee was "out of balance" but said, "if this is a decaf, they did a pretty good job." Mr. Bloostein faulted the coffee for having "little complexity" but said it had the best acidity.

Opus I Exotic



Ericka Burchett/WSJ

notes of seaweed and spinach as the coffee cooled, and said the aroma reminded him of a bowl of Chex cereal. Mr. Griffin called the coffee "not balanced" and "kind of flat." But after learning its provenance, both he and Mr. Colten said they had tasted it before and that it had made a decent cup of coffee.

Idillyum



Ericka Burchett/WSJ

cooled. Mr. Colten says he rarely drinks espresso but that he liked the Idillyum. "There was a lot of clarity all the way through," he said.

Juliet Chung

beans are a glossy brown and, to the untrained eye, virtually indistinguishable from other coffee beans in both appearance and smell.

Some are getting high marks from top buyers in the industry. Lindsey Bolger, coffee director for Green Mountain Coffee Roasters, calls the Doka Estate coffee one of the best she's tasted in her 20-year career. "It was sweet, clean and juicy," she recalls of a tasting in Costa Rica last spring. "It was a refreshing coffee, and I never describe coffee as being refreshing."

Experiencing something "new and good is rare," says Doug Welsh, Peet's vice president of coffee, who attended the same tasting.

Most of the coffee cultivated commercially today is made up of two primary species. Robusta, a hardy bean that grows largely in a narrow band around the Equator and has about 3% caffeine by weight, is used in lower-tier coffees sold at most convenience and grocery stores. Arabica, typically grown in higher-altitude regions near the Equator, has about half as much caffeine and is used in the lattes, mocha grandes and double espressos sold at chains like Starbucks and Dunkin' Donuts.

Illy was one of the first companies to embark on a serious quest to develop a flavorful, low-caf coffee bean. In 1989, Andrea Illy, 44, the third generation of Illys to head the 75-year-old Italian roaster, learned that an American coffee company was preparing to toss its research collection of some 185,000 coffee plants and acquired it. The collection included about 20,000 plants of a low-caffeine Arabica varietal called Laurina. The delicate varietal is known to produce high-quality beans but is also low-yielding and sensitive to disease and pests (caffeine is a natural pesticide).

Mr. Illy assembled a team of nine agronomists and technicians, who spent the next five years identifying Laurina plants in the collection on which to build a low-caffeine bean. They narrowed in on 15 "mother plants" based on characteristics such as productivity and coffee quality.

"It's like a funnel. You start from many and you reduce, reduce, reduce," Mr. Illy says.

The results of the earliest field tests in Brazil were so abysmal, however, that Mr. Illy considered scrapping the project. "There was a lot of mortality," he says.

By the time Illy began conducting more successful field tests of the plant in the rich volcanic soil of El Salvador in 2000, several companies had already begun assembling low-caf teams of their own, and others were soon to follow.

Like the Illy crew, some were honing in on the Laurina plant, easily identified by its distinctive Christmas-tree shape. The Doka Estate began to experiment with the plant in Costa Rica in 2002, after Edgardo Alpizar, a member of the Vargas family doing his graduate studies in agronomy, stumbled upon a lone Laurina tree near the site of his field work in San Jose. He planted 80 seeds of the plant on the slope of a volcano on his family's coffee estate. At an elevation of more than 5,000 feet, he observed, low yields and disease did not seem to be a problem. He kept increasing his production.

That same year, UCC Ueshima teamed up with a French agricultural research group and a local cooperative of growers in Réunion, a French island off the coast of Madagascar, and began cultivating Bourbon Pointu trees, an Arabica varietal that some agronomists say is the same as the Laurina.

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Meanwhile, Brazil's Datterra Coffee was hybridizing a descendant of a low-caffeine varietal from Ethiopia that had been stored at a Brazilian university's germplasm bank. In Hawaii, a private research company called Integrated Coffee Technologies was trying to figure out how to turn off a gene in the caffeine pathway that would inhibit its expression in the bean.

Companies including Starbucks and Dunkin' Donuts say they are not working on similar efforts. (A spokesperson for Kraft, which owns Maxwell House, declined to comment.) Stan Frankenthaler, executive chef and director of culinary development for Dunkin' Brands, says he is watching the development of the low-caf beans with great interest, although he has yet to taste the new varietals. He questions whether caffeine levels will be low enough to appeal to decaf drinkers and wonders how good the coffee will taste.

"When you're hybridizing for an over-expression of one attribute, the question becomes: Do I affect any other attributes within this variety? Is there any loss? Are there any other gains?"

Stephen Leach, the global buyer for coffee importer and exporter Maranatha, says it remains to be seen whether growers can keep their caffeine levels stable, since it can take years for the characteristics of a new agricultural product to stabilize.

Caffeine is one of the most widely consumed drugs in the world, and it's a profitable, if controversial one. A significant part of the profit many decaffeinated coffee makers make comes from sales of the caffeine they extract from coffee beans and sell to soda and pharmaceutical companies, according to Frank Dennis, chief executive of Swiss Water Decaffeinated Coffee Co., a Canadian company that does not resell caffeine.

That coffee contains caffeine, which many consumers say heightens their sense of alertness and well-being, may account for the fact that demand for coffee has remained relatively consistent, despite price fluctuations.

Research also suggests that there's a natural, optimal level for caffeine or similar stimulants in the bloodstream, and that people regulate that level by adjusting how much they consume. Some coffee makers say a great-tasting, lower-caffeine coffee could result in bigger profits, in part because caffeine-seekers might be inclined to drink more of it. "If you have lower-caffeine content with higher pleasure, you might be able to repeat your little luxury several times a day," Mr. Illy says.

The Illy team is currently working on details of the American launch of their low-caf line. But recently, high above Manhattan in Illycaffè's New York headquarters on Madison Avenue, all attention was focused for a moment on the coffee. The low buzz of an espresso machine had just fallen silent, and Mr. Illy poured a cup of Idillyum. It looked similar to any well-made espresso, with a thick layer of foam and a burnished caramel color. And the taste? Strong and acidic, at least to someone used to sweet, milky coffee.

To Mr. Illy, who ticked off notes of jasmine and chocolate, the cup was the fruition of nearly 20 years of research. "Coffee can be about experiencing incredible flavor and taste, which is inspiring the emotion, or it can be about the caffeine kick," he said. "We hate that, because you can get your caffeine kick with a pill, with a lousy coffee, with anything."

Mr. Illy lifted his cup of coffee into the air and inspected it. "For us, the lower the caffeine content, the better."

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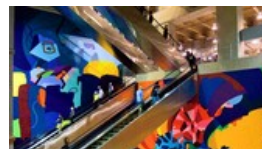
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