I hope everyone has now experienced the wondrous peanut-buttery taste of quakers (flashback to the first article in our Detecting Defects series), and I invite you to move forward along the coffee production chain to experience the tastes of rotted fruit, vinegar and even rotten fish. I know, these are not the descriptions we like to find at the cupping table, but in the interest of education, we are going to look at some defects that produce these particularly unpleasant profiles. For those of you following along in our series, in the interest of logic, I’m moving us forward in a linear fashion along the coffee production chain. We started with plant-based and harvesting defects, and we’re now going to examine defects generated in the next stage of coffee production: coffee processing.

Processing coffee is the phase in coffee production where the coffee seeds are removed from within the freshly harvested cherries, then dried and prepared for export as green coffee. Processing defects occur during this phase. With numerous steps and many different methods utilized (depending upon the origin country, region and/or buyer specifications), coffee processing is a critical and expansive phase in coffee production. As Robert Barker, vice president of quality assurance at Growers Direct Coffee in Berkeley, Calif., states, “Coffee processing can substantially remove defective beans or contribute to them.” In some cases, mistakes made in processing can ruin coffee, rendering it totally undrinkable. In better scenarios, defects developed during the coffee growing and harvesting phases can be mitigated or eliminated. With the employment of proper processing practices, producers can ensure that well-grown coffee seeds leave the country as top-grade green coffee suitable for the discriminating specialty market.

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The category of processing defects includes damage caused by incorrect or inadequate methods in pulping, washing, fermenting, drying, cleaning, and hulling. Specific defects that can occur within these phases include bruised beans, sour beans, overfermented beans, fermented/rotten beans, and many others.

To better understand defects created during processing, it’s helpful to first review the methods and steps in coffee processing. We will do this very briefly, then discuss the defects in more detail.

The methods of coffee processing are washed (or wet process), dry (or natural process) and semi-washed (or pulped natural). Each of these methods produces unique flavor profiles and are chosen depending upon the method used, including the following:

- Coffee buyers choose coffee based upon the cup profile utilized. However, in the modern world of specialty coffee, where water resources are limited, the dry process is most often utilized. Producers most often utilize the washed process, and in countries where climactic conditions of their region, availability of water natural). Each of these methods produces unique flavor profiles (washed), dry (or natural process) and semi-washed (or pulped natural).

The broad steps in coffee processing, which do vary depending upon the method used, include the following:

1. Pulping: removal of coffee seeds from within the coffee cherry (wet processing)
2. Fermentation and washing (wet processing)
3. Drying of fermented green beans still in parchment skin (in the dry method, coffee seeds are still within cherries and are often referred to as "green beans")
4. Storage of coffee parchment
5. Cleaning/sorting of coffee parchment prior to pulping
6. Hulling (removal of green beans from within parchment)
7. Grading/sorting
8. Bagging for export

Through shared and unclean equipment, and a number of other conditions can expedite the fermentation process of cherries to the nearest mill quickly enough after harvesting, for example, will impact the likelihood of overfermentation occurring. However, fermentation problems can and will occur in every producing country.

**OVERFERMENTATION**

Although there are many potential defects developed during processing—many just within our designated Phase One—I’ve chosen to focus on overfermentation because it remains a common problem and it can contribute to a number of different specific defects, including stinker, sour and black beans—all of which produce notable visual and taste defects. (Note: Black beans are often the result of plant-based problems prior to fermentation, but they can stem from overfermentation as well, so they are included here as an example of overfermentation-produced defects.)

**CATEGORIES OF PROCESSING DEFECTS**

<table>
<thead>
<tr>
<th>Defect Identification Chart</th>
<th>Causes</th>
<th>Visual Identification</th>
<th>Taste Identification</th>
<th>SCA Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sour</td>
<td>Overfermentation due to picking of overripe cherries, processing cherries that have fallen from the tree, water pollution, fungal contamination, humid conditions whereby fermentation begins before the cherries are on the tree</td>
<td>Full or partial yellow or yellow-brown coloring</td>
<td>Sour, vinegar-like flavor</td>
<td>Full sour—primary defect; 1 sour bean = 1 full defect</td>
</tr>
<tr>
<td>Black</td>
<td>Overfermentation due to picking of overripe cherries and/or improper management of conditions during processing</td>
<td>Full or partial black opaque coloring</td>
<td>Fermented/rotted fruit, dry, moldy, sour</td>
<td>Full black—primary defect; 2 black beans = 1 full defect</td>
</tr>
<tr>
<td>Stinker</td>
<td>Overfermentation due to extended/poor fermentation, polluted water, delay in pulping after picking</td>
<td>Light-brown, brown, black coloration and dull appearance</td>
<td>Fermented, roasted fruit, foul, rotten fish flavor</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Identification

Overfermented beans, used as a general defect here, are primarily identified by the taste of rotten fruit in the cup, and they are not visually recognizable. Deciding when a coffee has positive fruity characteristics versus when it has crossed to a rotten, overfermented quality can be a very individual decision, however. I have served on a number of cupping juries where half of the panel finds a coffee overfermented and half finds the coffee “pleasantly and wildly fruity.” Identifying overfermented coffee that has developed into specific defects is less controversial, though, because the negative flavors intensify and, as Alves states, “detection happens in the cup and also visually.”

The defect identification chart provides information on the continued on page 56
causes and identification methods for the three distinct defects mentioned earlier that can be caused by issues of overfermentation; potential causes included here are only those stemming from fermentation issues. Note that these defects, unlike the more general term “overfermented,” are identifiable visually, as well as on the palate.

Prevention

Overfermentation and the defects it produces can only be prevented by a firm command of the fermentation process as stated earlier. Natural fermentation often begins as soon as the coffee cherries are packed from the coffee trees (and in very humid conditions, sometimes while the cherries are still on the tree), so prevention strategies to avoid overfermentation must occur as soon as the coffee cherries are harvested.

There are many places in which fermentation varies (read: places in which fermentation can spiral out of control), so it makes sense that there are many strategies that farmers and millers must employ to avoid problems created by uncontrolled fermentation. Prevention strategies include processing coffees promptly after harvesting, adapting for temperature and other climactic conditions, carefully monitoring fermentation time, utilizing clean equipment and fresh water, and closely watching the process. One particular strategy to avoid the challenges of controlled fermentation used in washed processing is the use of mechanical de-mucilaging, an in-between processing method that is becoming more common.

Whether or not a miller goes so far as to modify their processing method to better control fermentation, conscientious and knowledgeable farmers and millers can often successfully control the conditions that can lead to overfermentation. Nonetheless, it is not always possible and certainly not always done, so it is important to find opportunities to eliminate visual and taste defects produced by overfermentation before export.

Fixes

To be crystal clear, overfermentation cannot be reversed. However, careful sorting and grading can eliminate some of the resulting defects of overfermentation before green coffee is exported. According to Rob Stephen, president, Coffee Solutions, Hopedale, Mass., “More attention to incoming coffee at the mill level, including cupping and solid grading, will discover defects like immature beans, sour and ferment.” Responsible millers should be able to visually identify and catch blacks, sours and stinker beans before samples reach specialty roasters, specialty importers and roasters should reject samples that do not follow the clearly defined visual standards for specialty coffee. However, general overferment, which is not identifiable by sight alone, is frequently not caught before export. Although more producers and millers are gaining skills in cupping analysis, there is still a steep learning curve in many countries.

What does this all mean for the specialty coffee roaster? You can probably guess what I’m going to say: cup carefully! And remember that the best way to learn how to identify taste defects is to taste them, so I send everyone off with the task of tasting some rotted fruit, vinegar and rotted fish.

ANDI C. TRINDLE

began working as a barista in 1989, and, to her surprise, remains in the specialty coffee industry 18 years later. She currently works as a green coffee trader with VOLCAFE Specialty Coffee. Andi also consults, lectures and volunteers extensively within the coffee industry both nationally and internationally. She is currently serving as President of the International Women’s Coffee Alliance and as co-chair of the Cupping Subcommittee for the Specialty Coffee Association of America Training Committee. She can be reached at andi@volcafespecialty.com.