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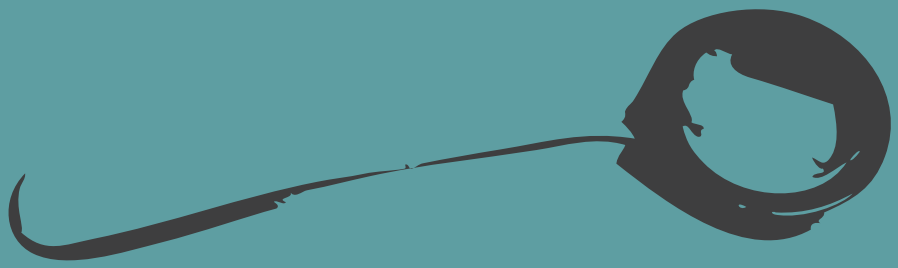
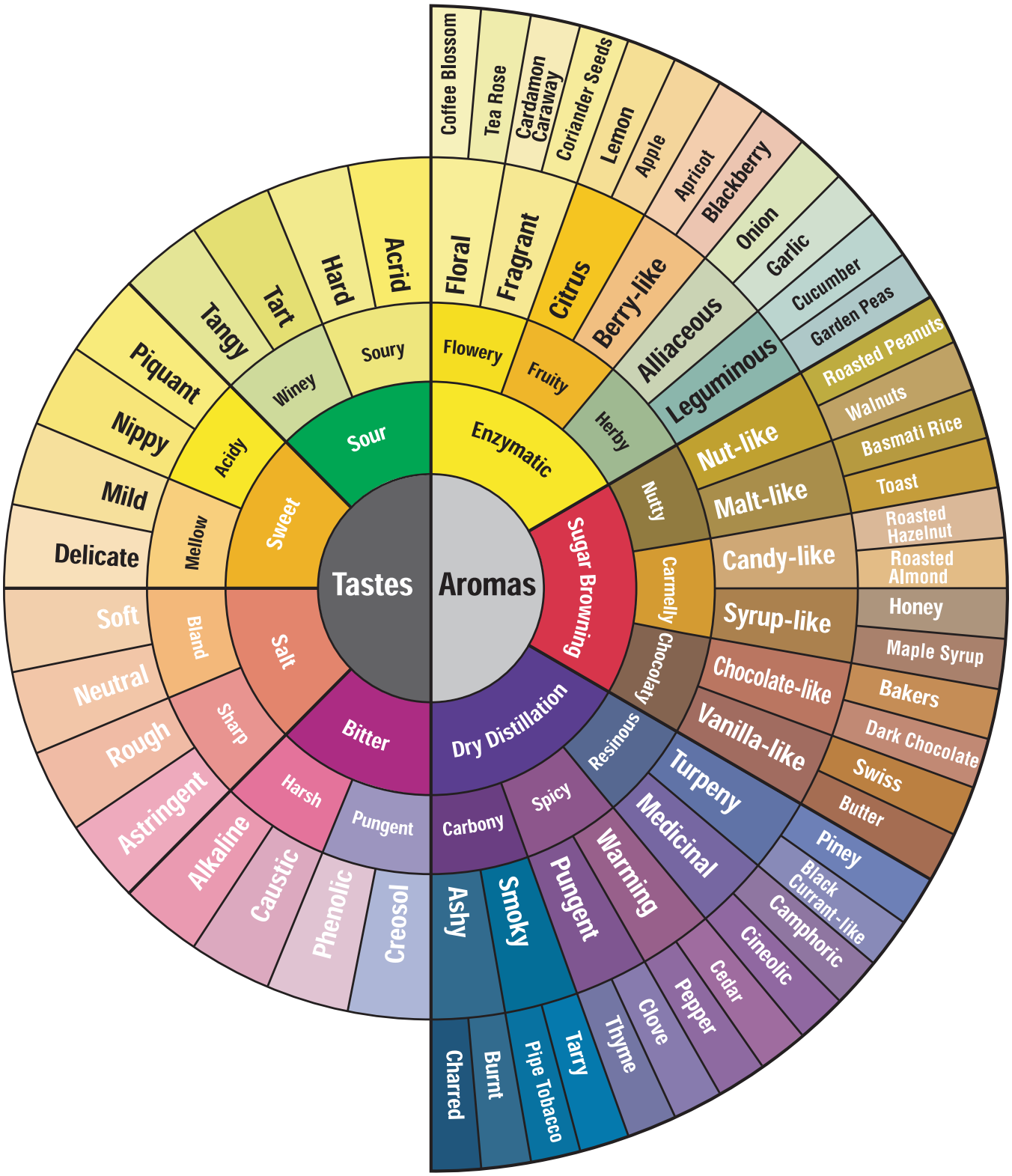


A Systematic Guide to the Sensory Evaluation of Coffee's Flavor

Fourth Edition

Coffee Taster's Flavor Wheel



Tastes & Aromas

The Coffee Cupper's Handbook

Systematic Guide to the Sensory Evaluation of Coffee's Flavor

By

Ted R. Lingle

Fourth Edition

Specialty Coffee Association of America

Long Beach, California

Founded in 1982, the Specialty Coffee Association of America (SCAA) is the world's largest non-profit trade association representing the coffee industry. With more than 2,000 member companies from the United States and nations throughout the world, SCAA's mission is to foster coffee excellence and consumption through education and information exchange. This mission is undertaken both for and with the help of the Association's membership, including coffee growers, exporters, importers, roasters, and retailers, as well as food-service professionals and representatives of allied industries.

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ABOUT THE AUTHOR

Ted R. Lingle was born and raised in Southern California. He graduated from the United States Military Academy in 1966, receiving a Bachelor of Science degree. He completed four years on active duty in the U.S. Army, serving in both Germany and Vietnam. In 1978 he received a Masters degree in Business Administration from Woodbury University in Los Angeles.

During the first twenty years of his coffee career, Mr. Lingle was Vice President of Marketing for Lingle Bros. Coffee, Inc., a business started by his grandfather in 1920 in Los Angeles. During this period he directed the company's sales programs for the food service, office coffee service, and specialty coffee market segments. His principle responsibilities included establishing quality standards for the company's products and conducting training programs for both company personnel and customers. In addition, Mr. Lingle represented the company on various coffee industry boards and committees.

Mr. Lingle served as a member of the National Coffee Association's Out-of-Home Market Committee from 1974 to 1990. He served on the Board of Directors of the National Coffee Service Association and was elected an honorary member in 1990. He was one of the founding Co-Chairmen of the Specialty Coffee Association of America.

In 1975, Mr. Lingle pioneered the development of the coffee Conductivity Meter, an electronic instrument used for the measurement of soluble solids in the coffee beverage. This was the first new method for assessing beverage quality since the coffee hydrometer, which was created in 1955. In designing the coffee Conductivity Meter, Mr. Lingle conducted extensive studies that developed the data base relating conductivity to brew strength and to beverage temperature that allowed for electronic calibration of the instrument.

Mr. Lingle played a key role in the formation and growth of the Coffee Development Group (CDG), a U.S. agency of the International Coffee Organization. He was the first chairman of both the Foodservice Education Task Force and the College Campus Task Force. He served on CDG's Board of Directors and as its Chairman in 1985-86.

In 1985, Mr. Lingle wrote the *Coffee Cupper's Handbook* to explain the science and chemistry behind the techniques used in coffee cupping. Coffee cupping is the traditional means for professional coffee tasters to make sensory evaluations of the coffee beans they select for their blends. The *Coffee Cupper's Handbook* deals with the basics of flavor chemistry and how the aroma, taste, and body of the coffee beverage relate to chemical make up, type and intensity of the components, and temperature and cooling of the various flavor compounds found in coffee.

In 1991, Mr. Lingle was appointed Executive Director of the Specialty Coffee Association of America. As the first full-time staff member of SCAA, he helped guide the Association's activities during its remarkable growth from 350 members in 1991 to over 2,400 members in 1995. During this period the Association established a number of technical standards that advance quality guidelines in all facets of coffee, from seed to cup.

In 1995, Mr. Lingle wrote the *Coffee Brewing Handbook* to promote excellence in beverage preparation. This work is a compendium of the various scientific studies on coffee brewing conducted by the coffee industry during the past fifty years, beginning with the important research of Dr. Ernest Lockhart, who served as the Scientific Director for the Coffee Brewing Center from 1952 to 1964. The book focuses on the science that supports the industry's standards and recommendations for good brewing practices.

In 1998 he was awarded the National Medal of Merit by the Federation of Coffee Growers of Colombia for his scientific efforts to improve quality. In 2004 he was award the Oren Flor del Café award from the National Association of Coffee Growers of Guatemala for his work in promoting sales of coffee based on denomination of origin. In 2007, he was awarded the Bwana Kahawa Lifetime Achievement award by the Eastern Africa Fine Coffee Association for his efforts to assist the coffee growers in East Africa increase the value and volume of coffee sales to the specialty coffee industry. In 2009, he was given the Lifetime Achievement Award by the Specialty Coffee Association of America.

In 2006 after 15 years of service to SCAA, Mr. Lingle retired from his position as Executive Director of SCAA to become the new Executive Director of the Coffee Quality Institute (CQI), a non-profit foundation established by SCAA in 1996.

ACKNOWLEDGEMENTS

The *Coffee Cupper's Handbook* evolved into a project far better that I originally had envisioned, largely due to the efforts of three people: Marvin Golden, Golden Food and Beverage in Boston, whose steadfast insistence on the importance of coffee's aromatic properties prompted me to expand a simple treatise on coffee's tastes; Sandy Sabo, the Communications Director of the Coffee Development Group in Washington, DC, whose skills as a writer transformed wordy, awkward passages into clear, concise prose; and Phyllis Baldenhofer, Coffee, Tea, and Spice in San Francisco, whose editorial skills and uncompromising quest for excellence pushed, pulled, and prodded a confused array of terms into a clear arrangement of concepts. I am indebted to these three coffee friends for their time, energy, and efforts.

The Promotion Fund of the International Coffee Organization, through the support of the activities of the Coffee Development Group, made this work possible. I would like to thank Alexandre Beltrao and ICO Board of Management for their vision and resolve to develop coffee promotion campaigns that touch upon diverse coffee industry segments beyond the conventional retail supermarkets.

The Specialty Coffee Association of America is carrying this work forward. I would like to thank Dan Cox and the Board of Directors of SCAA for their willingness to print and distribute the first edition of the *Coffee Cupper's Handbook* as an educational tool for their membership. It is my hope that the specialty segment will grow into the "flagship" of the entire coffee industry and will help the other industry segments chart a new course toward an expanding coffee market.

Although technical in nature, the *Coffee Cupper's Handbook* was written as a sales and marketing tool. In order to promote specialty coffee, the industry needs to develop a language that accurately portrays the flavor differences of coffees unique to special origins. The terminology used needs to be a scientific one, and place to learn the precise meaning of each new term is at the cupping table. The *Handbook* was written as the beginning step.

Since its first publication in 1985, the *Coffee Cupper's Handbook* has been revised through several editions and has been translated into three languages. It has served as the basis for cupping training for thousands of people in the coffee industry. The newly revised Fourth Edition represents the on-going work of hundreds of coffee professionals for more than a decade. I will be forever grateful for their commitment to understanding and defining coffee excellence.

FOREWARD

The basic difficulty in coffee flavor terminology is inherent in our language. Although many words describe the sensation of sight, sound, and touch, few words describe the sensations of smell and taste. Flavor terminology is further complicated by the misuse of related words such as aroma, odor, smell, fragrance, taste, flavor, and body, which are all applied indiscriminately in conversation and writing.

Resolution of the problem requires the development of a comprehensive and universally understood coffee flavor language to promote meaningful and accurate descriptions of the aromatic and taste properties of the chemical compounds present in the coffee brew. A coffee flavor language must reflect both the trade and lay terminology used by non-chemists for example, green coffee growers, importers, brokers, buyers, and roasters as well as the precise scientific terminology of chemists, chemical engineers, food technologists, and flavorists.

A coffee flavor language should also reflect the nature of the stimulus that evokes the terminology. Gases, liquids, and solids all require a set of terms that best depicts their individual contributions to a product's unique flavor. *If something does not become a gas, we cannot smell it. If something does not become a liquid, we can not taste it. And those things that do evaporate or dissolve, we can only feel in our mouths.* Thus aroma, taste, and mouthfeel are separate components of any comprehensive flavor language and must be given their own terminology.

The place to begin addressing the problems of flavor terminology is the cupping table, among people within the industry. When several cuppers sense the aromatic and taste properties of the same brew at the same time, they can begin to agree on the vocabulary pertinent to the flavor being experienced, leading to effective communication of aroma, taste, and body impressions. When translating this experience into other languages, tradition, culture, and common experiences must also be taken into consideration if the communication is to be meaningful.

The Coffee Cupper's Handbook is designed to initiate discussion on the most appropriate and descriptive terminology for the language of coffee flavors. It does not presume to be the definitive text.

GLOSSARY OF TECHNICAL TERMS

(Words that are starred* in text appear below.)

Absorbing The assimilation of one substance into another in which there is a transformation or loss of identity of the substance taken in.

Acidity A measure of the acid content of a fluid, with the relative strength (pH) of the acid quantified by the number of protons (hydrogen ions) released.

Adsorbing The adhesion of an extremely thin layer of molecules (as gases, liquids, or solids) to the surface of liquid or solid bodies with which they come in contact.

Aerate To change into a gaseous state by mixing with air.

Amino Acid An organic acid containing nitrogen-hydrogen (NH_2) molecule that forms chemically linked chains, which are the basic unit of proteins.

Brew Colloids Colloids formed by different combinations of oil and sediment suspended in brewed coffee; they give texture to the mouthfeel of coffee and contribute to the overall flavor by absorbing and adsorbing other chemical compounds.

Colloids A state of suspension in which non-dissolved, micro-sized particles are dispersed throughout a liquid. The particles are small enough to pass through most coarse filtering systems and do not settle out under the force of gravity.

Dry Distillation A process in which intense heat vaporizes and separates various chemical compounds bound in solid matter; also known as *destructive distillation*.

Equilibrium A state of natural balance in which changes in one condition offset (counter-balance) equal but opposite changes (reactions) in other conditions.

Hydrolysis A chemical change in both organic and inorganic compounds brought about by the action of water.

Inorganic Chemical compounds that do not contain carbon atoms, eg.-table salt (NaC1).

Liquoring The process that separates soluble matter from its carrying medium by treatment with a liquid substance.

Organic Chemical compounds that contain carbon atoms, such as sugar (CH_2O_6).

Oxidation A chemical change in both organic and inorganic compounds brought about by the action of oxygen.

Pyrolysis A chemical change in an organic substances brought about by the action of heat.

Volatile Readily vaporized at moderate heat levels. Characterized by liquids that quickly evaporate at room temperature.

INTRODUCTION

Although scientific knowledge about coffee has advanced during the past 25 years, much about coffee's flavor still remains a mystery. Coffee's distinctive flavor is certainly the principal reason for its high acceptability and enjoyment throughout the world. The difficulty in establishing the nature of this unique and popular flavor has both intrigued and frustrated flavor chemists for a long time.

Part of the problem in understanding coffee's flavor stems from its complexity. More that 400 organic* and inorganic* chemical compounds are present in trace amounts, and not one can be regarded as the primary component in coffee's flavor. In fact, many of the chemical components, when separated and concentrated, have highly objectionable flavors. Also, many of the natural components of coffee's flavor are unstable at room temperature, either rapidly evaporating or recombining with other components to form new flavor compounds.

Understanding coffee's flavor is further complicated by the intricate method in which the human palate responds to multiple sensations. Our natural ability to perceive flavor comes from the simultaneous sensations of aroma and taste. Millions of olfactory cells and thousands of taste buds record the stimulations, and then transmit the message through hundreds of nerve fibers to the brain. While the general process of flavor recognition is understood, the precise mechanisms that cause the stimulations in the limbic system in our brains, particularly olfaction, remain a mystery. Consequently, neither the pleasing nor the displeasing aspects of coffee's flavor are fully understood.

In spite of the complexity of the problem, we know enough about coffee's flavor to develop a simple, non-technical method for making a systematic sensory evaluation. This handbook offers a method for explaining and describing the sensory effects of the basic stimulations in the palate of coffee's aroma, taste, and body.

NATURAL SOURCE OF COFFEE'S FLAVOR

All of the chemical compounds that contribute to coffee's flavor evolve naturally. They are created as the coffee shrub converts water and carbon dioxide into sugar through photosynthesis. With the assistance of various mineral elements pulled from the soil, the coffee shrub metabolizes the plant sugars it has created, either using them for sustenance and growth, or storing them in its seeds (beans) for germination. Man interrupts this natural process by harvesting and drying the seeds, heating and crushing them, and extracting their chemical components with hot water. The resulting coffee beverage has *flavor*, *body*, and *color*, derived from a complex set of naturally occurring organic and inorganic compounds.

Coffee flavor is the simultaneous sensation in the palate of aroma and taste. Coffee aroma is composed of the *gaseous* natural chemical components of roasted coffee beans, which escape as gases after the coffee beans are ground, and as vapors after the coffee grounds are brewed. Coffee taste is composed of the *water soluble* organic and inorganic natural chemical components of roasted and ground coffee beans, which are extracted as liquids during the brewing process.

The palate records the sensations of aroma through olfactory cells located on the nasal membrane. The process of sensing odors is called ***olfaction***, which is the simultaneous sensation of thousands of distinct gaseous compounds. The nasal membrane has a capacity to sense not only the types of compounds present but also their intensity. It interprets these aromatic sensations as unique patterns, and the mind records them as distinct odors.

The palate records the sensations of taste through buds located on the tongue. The process of sensing taste is called ***gustation***, which is the simultaneous sensation of four basic tastes: *sweet*, *salt*, *sour*, and *bitter*. Through a process called taste modulation, these basic taste sensations interact with one another to produce the wide range of taste experiences.

Residues remaining in the palate that have not vaporized or dissolved create a sense of *body*, which is a relative comparison of the ***mouthfeel*** of the sensation to a standard substance, usually water.

SENSORY EVALUATION OF COFFEE'S FLAVOR

Sensory evaluation of coffee's flavor falls into three stages: *olfaction*, *gustation*, and *mouthfeel*.

Olfaction *(If something does not become a gas, we cannot smell it.)*

Stage I. Olfaction, is the sensory evaluation of the volatile organic* matter either occurring naturally or created in coffee beans by the roasting process. The relative volatility of the various chemical compounds (they change from a liquid to a gas at different temperatures) further divides coffee aromas into four categories.

1. *Dry aroma* – Usually referred to as *fragrance*, it is composed of the chemical compounds that are normally gases at room temperature or slightly warmer.
2. *Cup aroma* – Usually referred to as *aroma* when it is derived from the vapors leaving the surface of the brew.
3. *Nose-derived* – From the vapors, trapped by adhesion to liquids or solids in the brew, that is released as the coffee is taken into the mouth.
4. *Aftertaste* – The result of vapors developing from the

coffee residue remaining on the palate after the coffee has been swallowed.

The latter three categories are composed of the chemical compounds that are normally gases at the elevated temperatures associated with the brewing process.

There are four distinct points at which to evaluate the aromatic properties of the coffee; (1) the fragrance from the roasted and ground coffee beans; (2) the aroma; (3) the nose; and, (4) the aftertaste of the coffee brew.

Each individual coffee has its own pattern of aromatic properties, or *bouquet*. This unique pattern, when combined with coffee's particular taste modulation, creates the specific flavor profile of an individual coffee. Olfaction, therefore is the *primary sensory* means of differentiating coffees of similar origins from one another.

Gustation *(If something does not become a liquid, we cannot taste it.)*

Stage II. Gustation, is the sensory evaluation of the water soluble matter extracted from the coffee grounds during the brewing process. This matter consists of organic* and inorganic* chemical compounds. The organic matter in coffee can simplistically be describe as a variety of sugars, vegetable oils and fruit acids, commonly found in most vegetables, fruits, and nuts, whose taste sensations range from slightly sweet to highly sour. Coffee also contains organic compounds known as alkaloids (primarily caffeine) and esters (mainly chlorogenic acid), which impart a bitter taste sensation. The inorganic matter can simplistically be described as mineral salts (principally mineral oxides, particularly potassium), which impart a salt-like taste sensation, ranging from sweet to astringent or soapy to metallic, depending on the concentration.

The primary basic taste sensations in the gustation of coffee are sweet, sour, and salt. The function of the bitter sensation serves only to modify or enhance the impression of the other three, except for low-grade or darkly roasted coffees in which bitter becomes the dominant taste.

Taste modulation is the process by which the perception of one basic taste is altered by the relative strength of one or more of the other basic tastes. For example, adding salt to tomato juice increases the juice's perceptible sweetness. In the sensory evaluation of coffee, modulation of the three basic tastes leads to six primary coffee tastes. For this reason, coffees can be grouped into broad categories on the basis of similar tastes, which can also be related in a general way to their origins.

Mouthfeel *(And those things that do not evaporate or dissolve, we can only feel in our mouths.)*

Stage III. Mouthfeel, is the sensory evaluation of the tactile sensations on the palate. The sense organs are free nerve endings located on the tongue, gums, and hard and soft palates. In the sensory evaluation of coffee, these nerve endings sense the beverage's viscosity and oiliness, which collectively are known as *body*.

The viscosity, or thickness relative to water, is a function of the amount of solid material suspended in the brew. This solid material is principally composed of microscopic particles of bean fiber that are not filtered out during the brewing process.

The oiliness, or fat content, is a function of the amount of lipids (fats, oils, and waxes) in the coffee. At room temperature, these compounds are present in the green coffee bean as fats (oils in solid form). In the roasted coffee, the compounds are present in liquid form. These oils are extracted from roasted and ground coffee during the brewing process and remain undissolved, separating from the brew to coalesce as an oily residue on the surface of the beverage.

ORGANIZATION OF THE HANDBOOK

Section One of this handbook describes olfaction, gustation, and mouthfeel, as well as the primary chemical components of coffee's flavor. For example, the volatile (gaseous) ketones and aldehydes are discussed in terms of the aromatic contribution they make to coffee olfaction. Similarly, the nonvolatile (liquid) organic acids are discussed in terms of the taste contribution they make to coffee gustation. Finally, the undissloved liquid and solid constituents are examined in the context of their overall contributions to the coffee's mouthfeel.

Section Two enumerates the taints and faults that interfere with the flavor of coffee. Some of these have their source in various chemical reactions that occur in the coffee beans during the process of harvesting, drying, storing, roasting, and brewing. Others occur from contamination by external agents.

Section Three of the handbook lists the sequential steps involved in coffee cupping, from sample preparation through the assessment of aroma, taste, and body.

Section Four delineates various forms of charts and graphs that can be used in a systematic way of recording the sensory assessments for future reference and comparisons.

For the inexperienced coffee cupper, the *Handbook* is designed to create the general categories in which different coffees may be grouped on the basis of similar tastes. It offers the experienced cupper a vocabulary for differentiation among coffees of similar flavor based on their aromatic properties. For everyone, it provides the scientific frame-work for creating a meaningful vocabulary for differentiating coffee's flavor.

SECTION ONE:
EVALUATION OF COFFEE'S FLAVOR

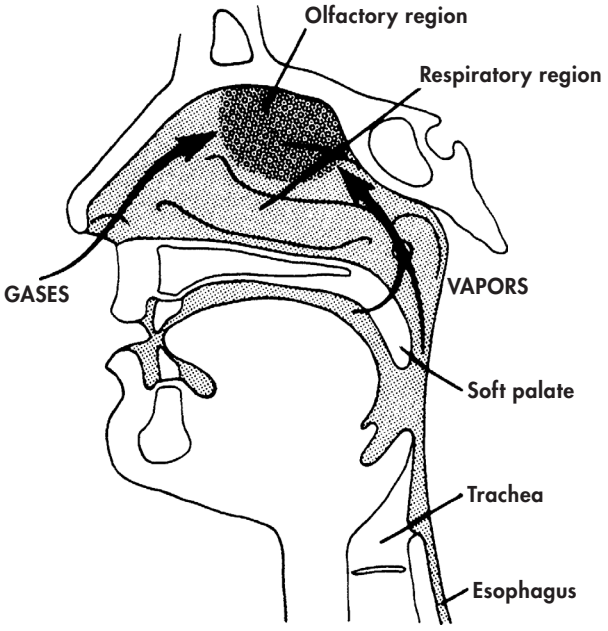
STAGE I: COFFEE OLFACTION

(If something does not become a gas, we can not smell it)

Olfaction is the smell sense whose receptors, situated in the nasal membrane, are stimulated by volatile chemical compounds that usually contain hydrogen, carbon, nitrogen, oxygen, or sulfur. These come into contact with receptors when they are inhaled as gases by sniffing, or exhaled as vapors by swallowing. The nasal membrane can sense thousands of distinct odors, with the average person capable of differentiating 2,000 to 4,000 odors.

During normal breathing, air does not reach the olfactory membranes. Sniffing or swallowing, however, forces air up the nasal passages through a series of membranes where the odorous molecules are retained. The olfactory region contains basa cells, sustentacular (supporting) cells, and sensory (olfactory) cells. Human beings have an estimated 10 to 20 million such receptors.

Olfactory acuity varies widely and can be influenced by external factors, such as a person's anatomy, physiology, and psychology. The result is that the same coffee, served at the same time, will exhibit slightly different aromatic characteristics to different people. Similarly, the same coffees will show slightly different characteristics when served to the same person at different times. Generally speaking, coffee cuppers rely on a highly developed odor memory created through years of experience, rather than on hypersensitivity to particular aromatic stimulations.



Chemical compounds reach the olfactory region as gases when sniffing occurs and as vapors when swallowing occurs.

When two or more olfactory stimuli are presented at the same time, which is normally the case with food products, one of six results may occur:

- A single new odor, blending the characteristic of each, may be perceived.
- When two dissimilar odors are presented, both odors may be noted, first one and then another being the center of attention.
- The odors may be smelled alternately.
- The odors may be experienced simultaneously but separately.
- One odor may mask another.
- One odor may neutralize the other.

In coffee, all of the above take place simultaneously, which is why coffee maintains a unique aromatic character reminiscent of other familiar natural substances.

While no primary odor sensations exist, specific odor sensations can be grouped into generic categories. These categories are based on the properties of the specific compound creating the odor sensation, such as its molecular weight, form, and polarity. The molecule structure itself evokes a common pattern in the intensity, type, and variety of the stimulation received by the olfactory receptors.

In developing generic categories, the aromatic compounds in coffee are classified by two methods. The first one separates the various components based on their source. Once classified by source, the second method sorts the components based on the similarity of molecular structure, principally by size (molecular weight). The result is a simple set of nine categories that describes the overall aromatic profile of coffee.

Classifying Aromatic Components According to Source

Based on their source, aromatic components can be divided into three sets:

SET I
ENZYMATIC BY-PRODUCTS
(most volatile aromatics)

This set contains aromatic compounds that are the result of enzyme reactions occurring in the coffee bean while it is a living organism. Principally composed of esters and aldehydes, it is the most volatile set and is most often found in the dry aroma of freshly ground coffee. Set I can be further separated into three basic categories: **flowery**, **fruity**, and **herby**.

A. Flowery
1. Floral
   a. Sweetly floral (jasmine, arnica, lavender, coffee blossom)
   b. Sweetly herbal (wintergreen, tea rose)
2. Fragrant
   a. Sweetly spicy (cardamom, cinnamon, sandalwood)
   b. Carvone-like (caraway, dill, spearmint)
   c. Sweetly camphoric (sweet basil, tarragon, coriander seeds)
   d. Anise-like (anise, fennel, basil)

B. Fruity
1. Citrus-like
   a. Sweet citrus (lemon, orange, tangerine)
   b. Dry citrus (grapes, apples, olives)
2. Berry-type
   a. Sweet berry-like (cherry, apricot, strawberry, date)
   b. Dry berry-like (cranberry, blackberry, boysenberry)

C. Herby
1. Alliaceous
   a. Onion-like (onion, chive)
   b. Garlic-like (garlic, leek, asafetida)
2. Leguminous
   a. Vegetable-like (garden peas, spinach, cabbage)
   b. Parsley-like (parsley, alfalfa, silage, cucumber)

SET II
SUGAR BROWNING BY-PRODUCTS
(moderately volatile aromatics)

Composed of aromatic compounds that are the result of the sugar browning (caramelization) reaction occurring during the roasting process, this set also divides into three basic categories: **nutty**, **caramelly**, and **chocolaty**.

Set II is moderately volatile, and it is found in both the cup aroma of freshly brewed coffee and the nose (vapors) of the coffee brew as it is swallowed. This set of aromatics (aldehydes, ketones, sugar carbonyl compounds, and pyrazine compounds) combine with the taste characteristics to create the principal *flavor* attributes of each type of coffee bean. They are the primary means of distinguishing one coffee of similar origin from another.

The presence of these sugar-browning by-products depends entirely on the roasting process. Because the aldehydes and ketones generally develop first, light-roasted coffee with have a pronounced *nutty character.* As the roasting process continues, the sugar molecules further condense into a brown mass known as caramel, which contains heterocyclic compounds, sulfur compounds, and alcohols.

Therefore, standard-roast coffees tend to have a *caramelly* character. Further heating reduces the caramel into pyrazine compounds, so full-roasted coffees may have a *chocolaty* character. Heating beyond this point begins to burn up the sugar browning by-products, so Set II is no longer the distinctive set in dark-roasted coffees.

A. Nutty (most common in light roast coffees)
1. Nutty (roasted nut-like)
   a. Almond-like
   b. Peanut-like
   c. Walnut-like
2. Malty (toasted cereal grain-like)
   a. Basmati rice
   b. Barley-like
   c. Corn-like
   d. Roasted coffee
   e. Toast

B. Caramelly (most common in standard roast coffees)
1. Candy-like
   a. Toffee-like (with butter)
   b. Licorice-like (with spices)
   c. Taffy-like (with salt)
   d. Pralines-like (with nuts)
   e. Hazelnut-like
2. Syrup-type
   a. Molasses-like
   b. Maple syrup-like
   c. Honey-like

C. Chocolaty (most common in full roast coffees)
1. Chocolate-type (with bitters)
   a. Baker's chocolate-like
   b. Dutch chocolate-like
   c. Dark chocolate-like
2. Vanilla-type (with butter)
   a. Swiss chocolate-like
   a. Custard-like
   c. Butter-like

SET III
DRY DISTILLATION BY-PRODUCTS
(least volatile aromatics)

Aromatic compounds that result from the dry distillation* (burning) reaction of bean fiber comprise Set III. This set, principally composed of heterocyclic compounds, nitriles, and hydrocarbons, is the least volatile and is most often found in the vapors (aftertaste) of freshly brewed coffee. The set contains three basic categories: **turpeny**, **spicy**, and **carbony**.

A. Turpeny
1. Resinous
   a. Piney (pine sap, turpentine, hemlock bark, black current stem-like)
   b. Balsamic (juniper, myrtle, chicory)
2. Medicinal
   a. Cinoelic (oregano, rosemary, eucalyptus leaf)
   b. Camphoric (camphor, cubeb, achillea)

B. Spicy
1. Warming
   a. Nutmeg-like (nutmeg, celery seed, cumin, cedar)
   b. Pepper-like (black pepper, capsicum, ginger)
2. Pungent
   a. Clove-like (clove bud, pimento, bay leaf)
   b. Thyme-like (thyme, savory, horsemint)
   c. Bitter almond-like (bitter almond, peach kernel)

C. Carbony
1. Smoky
   a. Creosol-like (oil, tar, fat)
   b. Smoke-like (pipe tobacco, nicotine)
2. Ashy
   a. Burnt-like (burnt, scorched)
   b. Charred-like (charred, ashy)

Bouquet: An Aromatic Profile

The total aromatic profile of coffee is defined as its *bouquet*. The bouquet is composed of four distinct parts:

- ***Fragrance*** - The gases from the freshly ground coffee.
- ***Aroma*** - The gases from the freshly brewed coffee.
- ***Nose*** - The vapors driven off as the coffee is swallowed.
- ***Aftertaste*** - The vapors remaining after the coffee is swallowed.

When cupping coffee, evaluate the aromatic character of each distinct part. In describing the aromatic profile, which is the key to accurately portraying the overall flavor of a particular coffee, give all four parts a descriptive term.

FRAGRANCE

When coffee beans are ground, the bean fiber is both heated and ruptured. This allows the carbon dioxide gas (CO_2) to escape. As it leaves, the CO_2 extracts other organic materials, changing them into a gaseous state at room temperature. These gasses, which are predominately esters, form the essence of coffee's fragrance. Normally the fragrance is sweet smelling, resembling some type of flower. In addition, the fragrance has some pungency, similar in character to a sweet spice.

AROMA

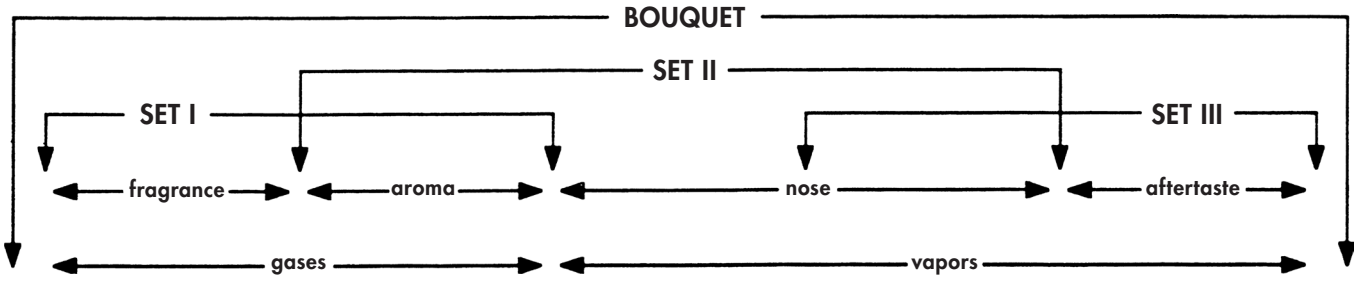
When ground coffee comes in contact with hot water, the heat from the water changes some of the organic material in the ground-up bean fiber from a liquid to a gas. These newly released gases – many of which are the larger molecular structure of esters, aldehydes, and ketones-form the essence of coffee's aroma, the most complex mixture of gases in the overall bouquet.

In general, the aroma is a mixture of fruity, herbal, and nut-like scents. Although the pattern is unmistakably coffee, fruity or herbal scents will usually dominate. Also, if the coffee has picked up a taint or fault, the off-flavor begins to become detectable in the aroma of the freshly brewed coffee.

Each of the bouquet's four parts relates to one of two sets of aromatic compounds.

NOSE

When the coffee brew is slurped, or vigorously sprayed toward the back of the palate, additional organic material, (present in the brew in a liquid state), aerates and changes into a gaseous state. Also, any gaseous material previously trapped in the liquid is immediately released. These vapors, which are mostly sugar carbonyl compounds, form the essence of coffee's nose.



Because most of these compounds were formed by a caramelization of sugars present in the green coffee bean during the roasting process, the character of the nose most often resembles other products created by caramelization of natural sugars. These sensations can range from various candies or syrups reminiscent of caramel, to roasted nuts, to toasted cereal grains. The character of the nose depends primarily on the degree of roast given the green beans.

AFTERTASTE

When the coffee brew is swallowed – or in the case of cupping, when swallowing is simulated by pumping the larynx to force air back into the nasal passages – some of the heavier organic material in the palate vaporizes. This set of vapors forms the essence of coffee's aftertaste; literally meaning the sensation perceived after the taste sensation has diminished.

Because dry distillation* of the bean fiber forms many of these heavier molecular components, they tend to have an aromatic character similar to wood or a wood by-product, ranging from turpentine to charcoal. The vapors usually have a pungency associated with a seed or spice, and they may have a note of bitterness, reminiscent of chocolate, due to the formation of pyrazine compounds during roasting.

In selecting the four terms that most accurately describe its fragrance, aroma, nose, and aftertaste, one can define a coffee bouquet's variety. The bouquet has one other aspect: intensity. The intensity is a measure of both the fullness and the strength of the organic compounds making up the aromatic profile. Bouquets that are both full and strong are described as *rich*. Bouquets that are full but lack intensity are described as *full*. An incomplete bouquet that lacks intensity is *rounded*, while flavors characterized by an absence of any bouquet are described as *flat*.

Thus, the systematic description of the flavor of a particular coffee – for example, Coffee AA – must include the description of the overall bouquet. The description of Coffee AA would begin with a statement about the roast color of the sample, because the degree of roast is almost as important as the origin of the coffee itself in developing its bouquet.

Suppose that Coffee AA is taken to a Full City Roast. The *fragrance* could be more spicy than floral, suggestive of cardamom; the *aroma* could be more herbal than fruity, reminiscent of green peas; the *nose* would have a highly pronounced caramelly and almond character; and the *aftertaste* would be distinctly spicy, almost like clove, with just a hint of a turpeny sensation reminiscent of mesquite-like smoke. In short, the bouquet of Coffee AA would be marvelously complex.

Olfaction Terminology

Aftertaste The sensation of brewed coffee vapors, ranging from chocolaty to carbony, spicy and turpeny, as they are released from the residue remaining in the mouth after swallowing.

Aroma The sensation of the gases released from brewed coffee as they are inhaled through the nose by sniffing. Ranges from fruity to herby to nutty.

Bouquet The total aromatic profile of a coffee brew. Created by the sensation of gases and vapors on the olfactory membranes. The result of the volatile organic compounds present in the fragrance, aroma, nose, and aftertaste of the brew.

Caramelly An aromatic sensation commonly found in the nose of the coffee brew. Created by moderately volatile sugar carbonyl compounds found in the vapors released as coffee is swallowed. Reminiscent of sensations from candies or syrups.

Carbony An aromatic sensation commonly found in the aftertaste of dark roast coffee brews. Created by slightly volatile heterocyclic compounds found in the vapors released when the brew is swallowed. Reminiscent of phenolic sensations similar to a creosol-like substance or pyridine sensations similar to a burnt substance.

Chocolaty An aromatic sensation commonly found in the coffee brew's aftertaste. Created by moderately volatile pyrazine compounds found in the vapors released after the brew is swallowed. Reminiscent of either unsweetened chocolate or vanilla.

Complexity A qualitative description of the gases and vapors present in the fragrance, aroma, nose, and aftertaste of coffee's bouquet, which create variety and contrast in the pattern of sensation on the olfactory membranes.

Flat A quantitative description of coffee's bouquet, denoting slightly perceptible gases and vapors in the fragrance, aroma, nose, and aftertaste.

Fragrance The sensation of the gases released from freshly roasted and ground coffee beans as aromatic compounds are inhaled through the nose by sniffing. Ranges from sweetly floral to sweetly spicy.

Fruity An aromatic sensation commonly found in the cup aroma of the coffee brew. Created by highly volatile aldehydes and esters that become gases at the elevated temperatures of brewing. Noted as a sweet sensation reminiscent of a citrus fruit, or a tart sensation, reminiscent of a berry fruit.

Full A quantitative description of coffee's overall bouquet, denoting a complete set of gases and vapors present at moderately pronounced intensities in the fragrance, aroma, nose, and aftertaste of the brew.

Herby An aromatic sensation commonly found in a brew's cup aroma. Created by highly volatile aldehydes and esters that become gases at the elevated temperatures of brewing. Noted as either alliaceous-type sensations reminiscent of an aromatic vegetable (onion) or legume-type sensations reminiscent of a green vegetable (green peas).

Intensity A quantitative measure of the pungency and relative strengths of the gases and vapors present in the bouquet coffee.

Malty An aromatic sensation normally found in the nose of the brew. Created by moderately volatile aldehydes and ketones found in the vapors as the brew is swallowed, producing sensations similar to toasted cereal grains.

Nose The sensation of the vapors released from brewed coffee as they are exhaled by the movement of the larynx while swallowing. Ranges from caramelly to chocolaty to turpeny.

Nutty An aromatic sensation commonly found in the nose of the brew. Created by moderately volatile aldehydes and ketones found in the vapors released as the brew is swallowed. Produces sensations associated with many roasted nuts.

Rich A quantitative description of coffee's bouquet, indicating that a complete set of gases and vapors is present at highly pronounced intensities in the fragrance, aroma, nose, and aftertaste of the coffee.

Rounded A quantitative description of coffee's bouquet, indicating that an incomplete set of gases and vapors is moderately perceptible in the coffee's fragrance, aroma, nose, and aftertaste.

Spicy An aromatic sensation commonly found in brew's aftertaste. Created by slightly volatile hydrocarbon compounds found in the vapor released after the brew is swallowed. Produces sensations reminiscent of wood-spice (cinnamon bark) or wood-seed (clove bud).

Sweetly Floral An aromatic sensation commonly found in the fragrance of roasted and ground coffee beans. Created by highly volatile aldehydes and esters found in the gases (principally carbon dioxide) that escape from the newly ruptured cells of the bean fiber. Reminiscent of a fragrant flower, such as jasmine.

Sweetly Spicy An aromatic sensation commonly found in the fragrance of roasted and ground coffee beans. Created by highly volatile aldehydes and esters found in the gases (principally carbon dioxide) that escape from the newly ruptured cells of the bean fiber. Reminiscent of aromatic spices, such as cardamom.

Turpeny An aromatic sensation commonly found in the coffee brew's aftertaste. Created by slightly volatile hydrocarbon compounds and nitriles found in the vapor released after the brew is swallowed. Reminiscent of resinous sensations (similar to turpentine-like substances) or medicinal sensations (similar to camphor-like substances).

STAGE II: COFFEE GUSTATION

(If something does not become a liquid, we cannot taste it.)

Gustation is the taste sense whose receptors lie in the mucous membrane covering the tongue and whose stimuli consist of soluble chemical compounds.

Four Basic Tastes

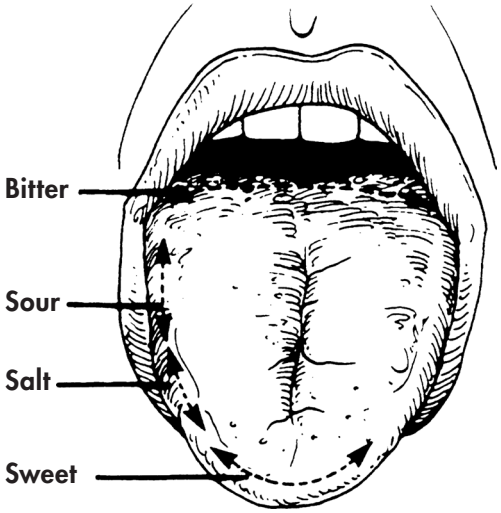
As a general rule, the tongue can detect four basic tastes: sweet, salt, sour, and bitter.

Sweet Characterized by solutions of sugars, alcohols, lycols, and some acids. Perceived primarily by the fungiform papillae at the tip of the tongue.

Salt. Characterized by solutions of chlorides, bromides, iodides, nitrates, and sulfates. Perceived by the fungiform and foliate papillae on the anterior sides of the tongue.

Sour. Characterized by solutions of tartaric, citric, and malic acids. Perceived by the foliate and fungi-form papillae on the posterior sides of the tongue.

Bitter. Characterized by solutions of quinine, caffeine, and other alkaloids. Perceived primarily by the circumvallate papillae at the back of the tongue.



Different areas on the tongue have varying degrees of sensitivity to the four basic tastes.

The water soluble chemical compounds in coffee, which result in the liquoring* character of the brew, can be grouped according to the taste sensations they create:

Taste Sensation	Chemical Compound	Solubles %
SWEET		
Carbohydrates	Caramelized sugars	35.0
Proteins	Amino acid complexes	4.0
SALT		
Mineral Oxides	Potassium oxide	8.4
	Phosphoric oxide	2.1
	Calcium oxide	2.1
	Magnesium oxide	0.5
	Sodium oxide	0.5
	Other oxides	0.4
SOUR		
Novolatile Acids	Caffeic acid	1.4
	Citric acid	1.0
	Malic acid	1.0
	Tartaric acid	1.0
BITTER		
Alkaloids	Caffeine	3.5
	Trigonelline	3.5
Nonvolatile Acids	Quinic acid	1.4
Esters	Chlorogenic acid	13.0
Phenols	Phenolic complexes	5.0

The coffee taste sensation combines all four of these basic tastes. Three of them – sweet, salt, and sour – tend to dominate the overall taste sensation, primarily because the compounds that create them are present in the greatest quantities.

Although the term bitter is popularly used to describe poor coffee tastes, coffee's bitterness is a taste sensation unique to coffee, similar to the effects of tannins in red wines or hops in beer. Using bitter as a solely negative attribute of coffee's taste is technically incorrect. Bitterness is often a positive taste contributor, such as in tea, red wines, and beer.

Six Primary Coffee Taste Sensations

Through the process called *taste modulation*, the basic taste sensations interact with one another, depending on the relative strength of each. In coffee gustation, six combinations can occur:

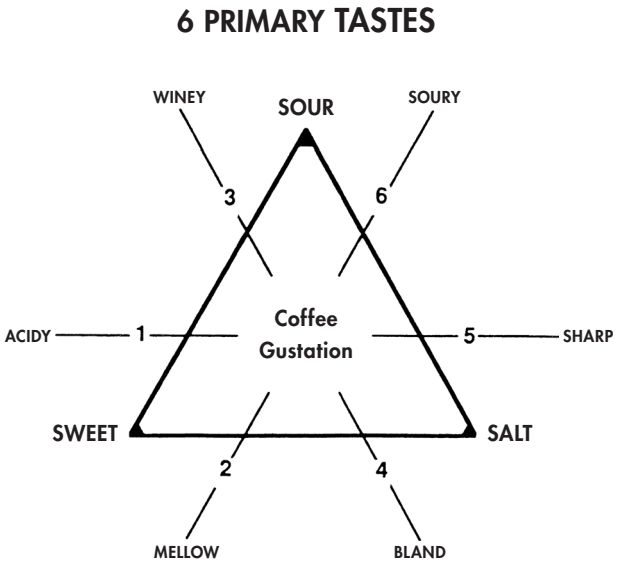
1. Acids increase the sweetness of sugars – *acidy.*
2. Salts increase the sweetness of sugars – *mellow.*
3. Sugars reduce the sour taste of acids – *winey.*
4. Sugars reduce the saltiness of salt – *bland.*

5. Acids increase the saltiness of salts – *sharp.*

6. Salts reduce the sourness of acids – *soury.*

Sweet, sour, and salt taste interact to form the six primary coffee taste sensations.

The beginning step in systematically describing a particular coffee taste is to identify which of the six primary coffee tastes most correctly fit the taste modulation sensation on the tongue.



Acidy Perceived primarily at the tip of the tongue. Created as acids in the coffee combine with the sugars to increase the overall sweetness of the brew.

Mellow Perceived primarily at the tip of the tongue. Created as the salts in the coffee combine with the sugars to increase the overall sweetness of the brew.

Winey Perceived primarily on the posterior sides of the tongue. Created as the sugars in the coffee combine with the acids to reduce the overall sourness of the brew.

Bland Perceived primarily on the anterior sides of the tongue. Created as the sugars in the coffee combine with the salts to reduce the overall saltiness of the brew.

Sharp Perceived primarily on the anterior sides of the tongue. Created as the acids in the coffee combine with the salts to increase the overall saltiness of the brew.

Soury Perceived primarily on the posterior sides of the tongue. Created as the salts in the coffee combine with the acids to reduce the overall sourness of the brew.

Taste discrimination depends somewhat on temperature. Therefore, in cupping coffee, the most accurate overall taste impression is recorded as the coffee is tasted through a range of several different temperatures. The three basic taste sensations in coffee are altered by temperature in the following ways:

- Relative sweetness decreases as temperature increases. Acidy and mellow sensations show the greatest taste change because the influence of the sugars is greatly reduced at higher temperatures.
- Relative saltiness decreases as temperature increases. Bland and sharp taste show a moderate change due to temperature, as the taste influence of the salts is reduced.
- Temperature does not affect relative sourness. Therefore, winey and soury tastes show the least change due to temperature because the influence of the sour fruit acids is not affected.

After identifying the primary taste sensation, the next step is to determine the degree to which the specific taste sensation fits into the primary category. This is done by selecting the appropriate secondary taste term that describes the direction of the taste sensation.

For example, a winey taste that tends toward sweet would be referred to as tangy, while a winey taste that tends towards sour would be referred to as tart. In finding the most appropriate secondary taste term, a person is usually more limited by language and vocabulary than by the ability to discriminate between different coffee taste sensations.

The third and final step in the gustation of coffee is determining the intensity of the taste sensation, which ranges from perceptible to pronounced. It is usually best described by an appropriate adverb – highly, moderately, or slightly.

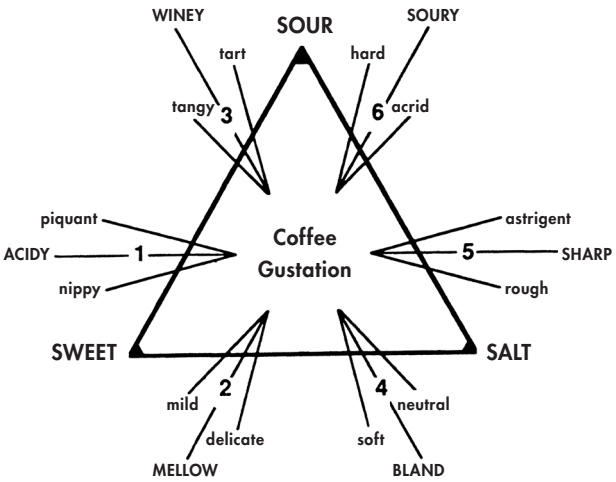
In the example of Coffee AA taken to a Full City Roast, the systematic description of the flavor would include a description of the overall liquoring sensations. First, the primary description of Coffee AA could be classified as acidy, meaning the acids in the coffee have combined with the sugars to increase the overall sweetness of the brew.

In addition, there is a slightly pronounced winey taste, also indicating the prevalence of fruit acids, or possibly acetic acid. The slightly perceptible sharp and pungent attributes give the overall liquoring sensation a tart character.

TWELVE SECONDARY TASTES

At a minimum, the six primary coffee tastes can be further categorized into 12 secondary tastes:

12 Secondary Tastes

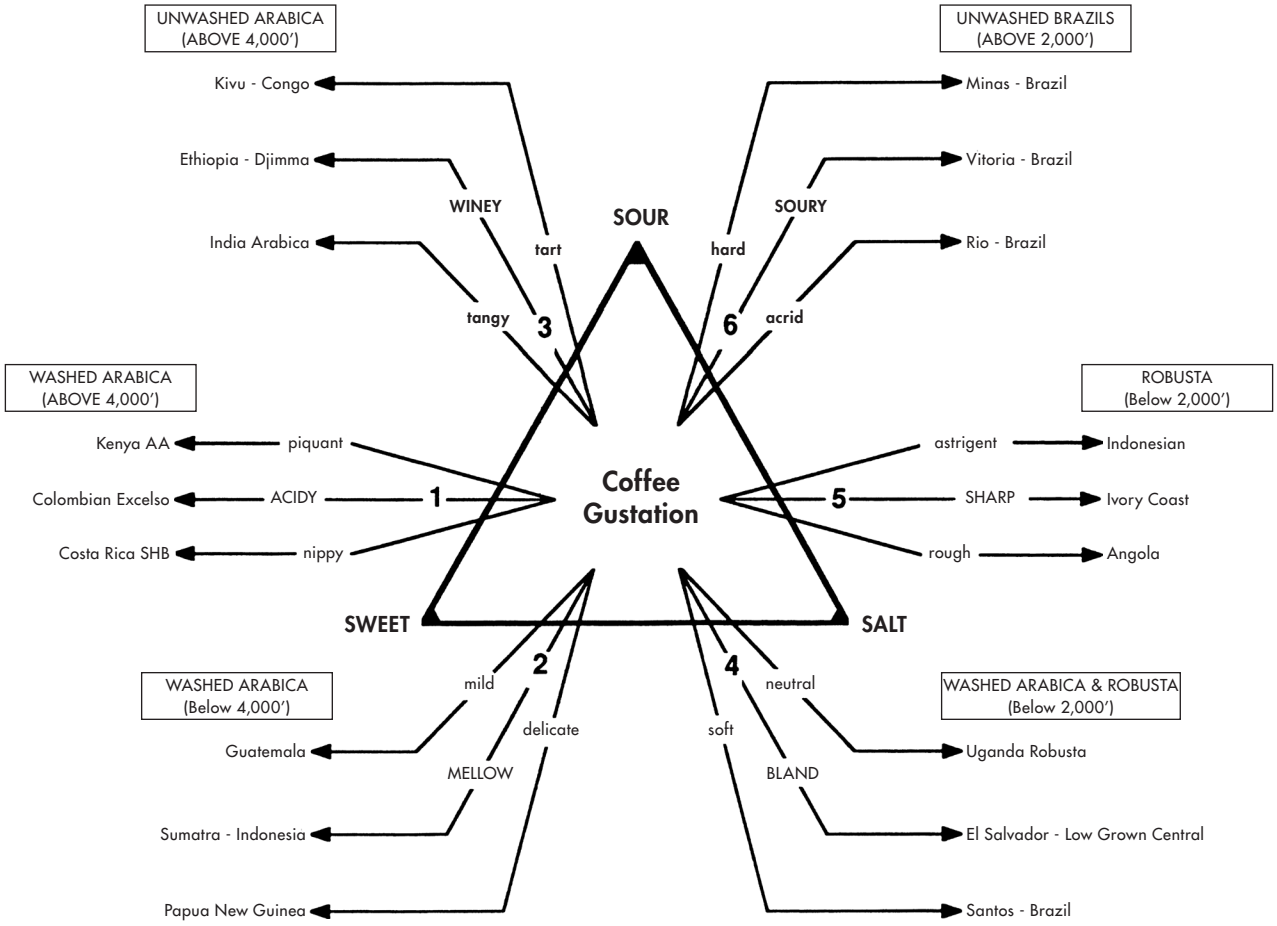


Varying concentrations of sweet, sour, and salt tastes influence the six primary tastes.

COFFEE TASTE SENSATIONS

Primary Term	Variation	Taste Term
Acidy	Toward Sweet	*Nippy*
	Toward Sour	*Piquant*
Mellow	Toward Sweet	*Mild*
	Toward Salty	*Delicate*
Winey	Toward Sweet	*Tangy*
	Toward Sour	*Tart*
Bland	Toward Sweet	*Soft*
	Toward Salty	*Neutral*
Sharp	Toward Salty	*Rough*
	Toward Sour	*Astringent*
Soury	Toward Salty	*Acrid*
	Toward Sour	*Hard*

REPRESENTATIVE TASTE TYPES



Dark-Roast Coffees

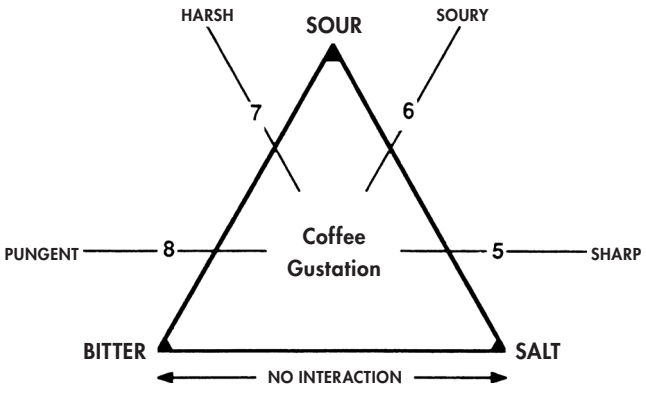
Dark-roast coffees offer a different modulation of the basic tastes. Because the majority of the sugars decompose due to the extensive pyrolysis* of the bean, the sweet characteristic in the taste is lost. It is replaced by the bitter taste perception attributable to the increase in phenolic compounds.

The taste sensation of bitterness is generally misunderstood, and in most foods bitterness is considered undesirable. However, in several products, such as dark chocolate, certain beers, red wines, and tonic water, the bitter attribute is both characteristic and desirable. In all of these situations, modulation of the bitter taste contributes greatly to the total flavor profile. The same is true for coffee.

Foods and beverages, in which bitterness comprises the basic modulation component of the taste perception, tend to spark the greatest controversy as to their overall acceptability. Although dark-roasted coffees represent an important segment of the total coffee market, the bitter aspect of their tastes tends to reduce their universal acceptance.

In coffee, the bitter components of the taste come from three sources. First, bitterness is a taste characteristic of certain nonvolatile acids also found in coffee, particularly chlorogenic and quinic acids. Second, bitterness is the basic taste characteristic of caffeine and trigonilline – white crystalline alkaloids occurring naturally in coffee beans, tea leaves, cocoa beans, and cola nuts. And third, bitterness is a taste characteristic associated with phenolic and heterocyclic compounds, which form as the coffee beans undergo continued pyrolysis* and develop from standard roast coffees into dark-roast coffees.

4 COMBINATIONS WITH BITTER



Four combinations arise in the gustation of dark-roast coffees.

In the gustation of dark-roast coffees, four combinations usually arise. Two are similar to the taste modulation of standard-roast coffees:

5 Acids increase the saltiness of salts – *sharp*
6 Salts reduce the sourness of acids – *soury*

Two combinations are unique to the taste modulation of dark roast coffees:

7 Bittering agents increase the sourness of acids – *harsh*
8 Acids decrease the bitterness of bittering agents – *pungent*.

Two of the four basic tastes, bitter and salt, do not interact.

PRIMARY DARK-ROAST COFFEE TASTE SENSATIONS

The first step when describing the flavor of a dark roast coffee is to identify the primary coffee taste sensation:

Sharp Perceived primarily on the anterior sides of the tongue. Created as the acids in the coffee combine with the salts to increase the overall saltiness of the brew.

Soury Perceived primarily on the posterior sides of the tongue. Created as the salts in the coffee combine with the acids to reduce the overall sourness of the brew.

Harsh Perceived primarily on the back of the tongue. Created as the bittering agents in the coffee combine with the acids to increase the overall sourness of the brew.

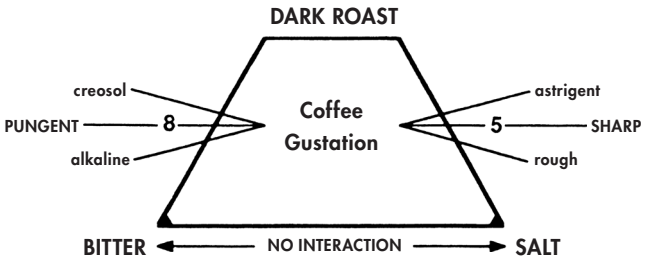
Pungent Perceived primarily on the back of the tongue. Created as the acids in the coffee combine with the bittering agents to decrease the overall bitterness of the brew.

The second step in describing a dark-roast coffee flavor is to determine the degree to which the specific taste sensation fits into the primary category. As a minimum, the two most common primary tastes found in dark-roast coffees, pungent and sharp, can be further categorized into four secondary tastes.

In this phase of taste discrimination, several factors unique to dark-roast coffees are encountered. First, because temperature hardly affects the basic tastes of sour and bitter, dark-roast coffees tend to show the same taste

regardless of temperature. Second, because many of the sour fruit acid components of the coffee bean burn up along with the sugar compounds during roasting, it is unusual to have a sour taste as the predominant taste of a dark roast coffee. And third, the taste perception of bitterness actually decreases as the concentration of bittering agents increases. That is why espresso coffees tend to have less of a bitter character in their flavor than if the same dark-roast coffee were brewed in a conventional coffee brewer. Dark-roast coffees tend to have a taste that is simultaneously sharp and pungent.

Dark-Roast Tastes



Roasting coffee darkly usually removes any sour taste.

Secondary Term	Variation	Taste Term
Sharp	Sharp towards Salty	*Rough*
	Sharp towards Sour	*Astringent*
Pungent	Pungent toward Sour	*Creosoty*
	Pungent toward Bitter	*Alkaline*

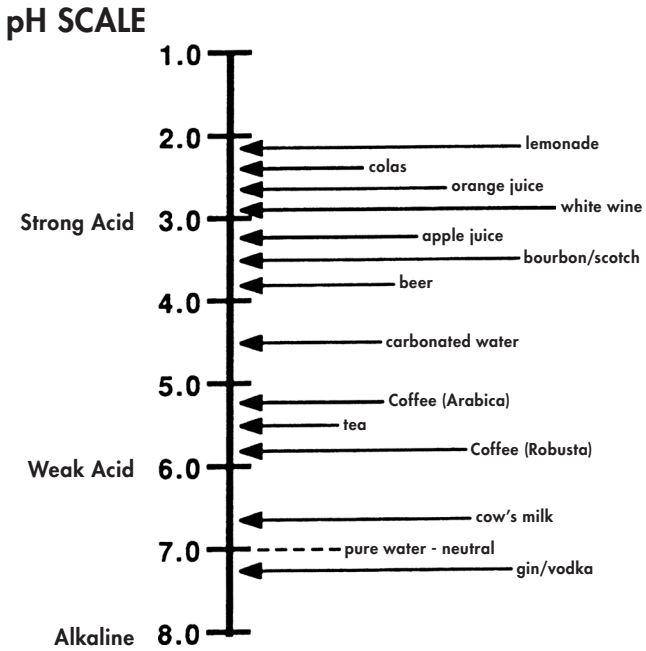
Coffee Acidity

Perhaps one of the most misused and misunderstood sensory terms used to evaluate coffee's taste is *acidity*.* It is a quantitative term that refers to the relative strength of the acids present in the fluid being evaluated. Although the coffee term *acidy* and the sensory term *acidity* are related, the two are not interchangeable. In fact, coffees described as very *acidy* are not very high in acidity.

A chemist defines an *acid* as a chemical compound containing hydrogen atoms that are capable of giving off protons (hydrogen ions); a condition which can be measured quantitatively. To a food technologist, virtually all beverages are acidic, with their relative strengths measured by a pH number, a quantitative measure of the presence of free hydrogen ions.

Coffee contains a wide variety of different types of acids, most of which are found in other agricultural products. These groups include amino acids, such as asparagine, glutamic, and leucine; phenolic acids, such as caffeic, chlorogenic, quinic; and aliphatic acids, such as acetic, lactic, citric, malic, fumaric, oxalic, phosphoric, and tartaric. From a general taste perspective, higher than normal concentrations of amino acids lead to *sweet* type flavor sensations; higher levels of phenolic acids lead to *bitter* type sensations; while higher amounts of aliphatic acids lead to *sour* type sensations.

Common Household Beverages



By all objective measurements, coffee is one of the least acidic beverages consumed in a typical household.

In terms of concentration, the phenolic acid group accounts for the greatest percentage (by the volume) of the acids found in brewed coffee. By far, the largest component of this group is chlorogenic acid. Chlorogenic acids in coffee include three main groups: caffeoylquinic acids; feruloylquinic acids; and dicaffeoylquinic acids. While the organoleptic properties of chlorogenic acids have received little study, there are indications that both the amount (Robusta coffees have substantially more than Arabicas) and the proportion of the various types (immature fruit and black beans have higher concentrations of certain types) play a major role in determining the overall acceptability of the beverage.

The chlorogenic acid group also plays an additional important role in determining the flavor of *freshly* brewed coffee. Chlorogenic acid is fairly unstable and decomposes into caffeic and quinic acid as the coffee sits in the pot, particular at temperatures above 185ºF or below 175ºF. Once split apart, the quinic acid has a noticeably bitter

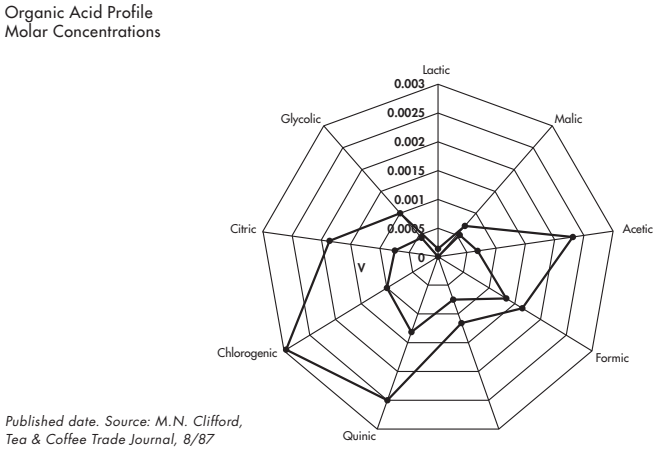
taste, and the caffeic acid is recognizably sour. Together this combination of bitter and sour creates the *acerbic* taste and smell of *old coffee*.

The next most important group is the aliphatic acids. While not the greatest in volume, this group of acids tends to produce the greatest quantity of hydrogen ions. This increased concentration of hydrogen ions, as measured by the pH of the acid, is associated with *sourness*. The order of intensity of these acids found in coffee is usually given as: tartaric, citric, malic, lactic, and acetic. It has also been shown that this increased concentration significantly impacts the perception of the other basic tastes, particularly sweet.

In addition, each acid will have its own characteristic flavor, such as the *lemony* flavor of citric acid, the *buttery* flavor of lactic acid, and the *apple-like* flavor of malic acid, which are often more perceptible as odors rather than tastes. Acetic acid is a special case in coffee. Its presence is often the result of the fermentation process in washed coffee. Controlling the fermentation is a critical quality control aspect in this method of preparation. If too much acetic acid is formed, the green beans develop a characteristic *fruity* smell that is a precursor to a highly objectionable *fermented* taste in brewed coffee.

In general taste sense, it is the presence of the aliphatic acid group that gives *brightness* and *zest* to coffee's flavor and is the underlying reason why coffees with a high acidity (low pH value – 4.8 to 5.1) are typically sold at premium prices.

Organic Acid Profile



Published date. Source: M.N. Clifford, Tea & Coffee Trade Journal, 8/87

Coffee acidity, as low as it is, is a very positive taste attribute in coffee's flavor.

Compared to wine, coffee has a limited set of acids that affect its taste, which explains why so much of coffee's flavor is locked up in its bouquet. While wine tasting creates an interesting exercise in gustation, due to the varied and intricate taste sensations of fruit acids, coffee cupping offers stimulating challenges in olfaction, due to the various combinations and patterns of aromatic scents offered by the complex, volatile components of coffee beans.

Gustation Terminology

Acidy A primary taste sensation related to the presence of sweet-tasting compounds. Created as acids in the coffee combine with sugars to increase the brew's overall sweetness. A characteristic found most often in washed Arabica coffees grown above 4,000 feet, such as Colombian Supremo. Acidy coffees range in taste from *piquant* to *nippy*, with the taste sensation experienced at the tip of the tongue.

Acrid A secondary coffee taste sensation related to *soury*. Characterized by a predominately piercing, sour sensation on the posterior sides of the tongue when the brew is first sipped; then replaced by a distinct sour sensation as the brew cools. Caused by a higher than normal percentage of acids increasing the salty taste sensation during taste modulation of salt and sour. Typified by an unwashed Rio coffee from Brazil.

Alkaline A secondary coffee taste sensation related to *pungent*, typical in dark-roast coffees. Characterized by a dry, clawing sensation at the back of the tongue. Caused by alkaline and phenolic compounds that have bitter-not necessarily displeasing – taste sensations.

Astringent A secondary coffee taste sensation related to *sharp*. Characterized by a predominately puckering, salty sensation on the anterior sides of the tongue when the brew is first sipped. Caused by acids increasing the perceived saltiness during modulation of the predominately salty taste sensation. Typified by an unwashed Indonesian Robusta coffee.

Basic Tastes Sweet, sour, salt, and bitter, respectively characterized by sucrose, tartaric acid, sodium chloride, and quinine.

Bitter A basic taste characterized by solutions of quinine, caffeine, and certain other alkaloids. Perceived primarily by the circumvallate papillae at the back of the tongue.

Bland A primary coffee taste sensation related to the presence of salty tasting compounds. Created as the sugars in the coffee combine with the salts to reduce the overall saltiness of the brew. A characteristic found most often in washed Arabica coffees grown below 2,000 feet, such as a washed Arabica coffee from El Salvador (Low Grown Central). Bland coffees range in taste from "soft" to neutral, with the taste sensation experienced on the sides of the tongue.

Caustic A secondary coffee taste sensation related to *harsh*. Characterized by a burning, sour sensation on the posterior sides of the tongue when the brew is first sipped; replaced by a highly displeasing sour sensation as the brew cools. Caused by bitter replacing sweet in the basic taste modulation because of a loss or lack of sugars in green coffee beans. Typified by an unwashed Liberica coffee.

Creosoty A secondary coffee taste sensation related to *pungent*, which is typical in dark roast coffees. Characterized by a predominately scratching sensation at the back of the tongue when the brew is first sipped, followed by a strong aftertaste as the brew is swallowed. Created by the dry distillation of the bean fibers at elevated roasting temperatures, when pyridine and phenolic compounds mix to produce burnt and oil-like taste sensations.

Delicate A secondary coffee taste sensation related to *mellow*. Characterized by a fragile, subtle sweet sensation just past the tip of the tongue when the brew is first sipped; replaced by a sweet sensation as the brew cools. Caused by the lowest possible combination of sugars and salts that still produces a sweet cast to the taste but can easily be broken up by other taste sensations. Typified by a washed Papua New Guinea Arabica coffee.

Hard A secondary coffee taste sensation related to *soury*. Characterized by a predominately stinging, sour sensation on the posterior sides of the tongue when the brew is first sipped, replaced by a dominant sour sensation as the brew cools. Caused by an enzymatic activity in the cherries converting sugars to acids when the fruit pulp has been bruised during harvesting or drying. Typified by a natural Parana coffee from Brazil.

Medicinal A secondary coffee taste term related to *harsh*. Characterized by a penetrating sour sensation on the posterior sides of the tongue when the brew is first sipped; replaced by a chemical sensation reminiscent of iodine as the brew cools, caused by the alkaloids increasing the sourness of the acids without any taste modulation of sweetness. Typical of coffees in which cherries are contaminated by bacteria growth.

Mellow A primary coffee taste sensation related to the presence of sweet tasting compounds. Created as salts in the coffee combine with sugars to increase the brew's overall sweetness. A characteristic found most often in washed Arabica coffees grown below 4,000 feet, such as Arabica coffee from Sumatra, Indonesia. Mellow coffees range in taste from *mild* to *delicate* with the taste sensation experienced at the tip of the tongue.

Mild A secondary coffee taste sensation related to *mellow*. Characterized by a predominately sweet tingle just past the tip of the tongue when the brew is first sipped; replaced by a sweet sensation as the brew cools. Caused by the taste modulation of high concentrations of both sweet and salty compounds. Typified by a washed Arabica coffee from Guatemala.

Neutral A secondary coffee taste sensation related to *bland*. Characterized by the absence of any predominant taste sensation on any part of the tongue when the brew is first sipped; replaced by a distinct dry sensation on the sides of the tongue as the brew cools. Caused by a concentration of salts high enough to neutralize both the sour taste of the acids and the sweet taste of the sugars but not high enough to evoke a salty taste sensation. Typified by a washed Uganda Robusta coffee.

Nippy A secondary coffee taste sensation related to *acidy*. Characterized by a predominately sweet, nipping sensation at the tip of the tongue when the brew is first sipped; replaced by a sweet sensation as the brew cools. Caused by a higher than normal percentage of the acids perceived as sour during modulation of the predominately sweet taste sensation. Typified by a Costa Rica SHB coffee.

Piquant A secondary coffee taste sensation related to *acidy*. Characterized by a predominately sweet, prickling sensation at the tip of the tongue when the brew is first sipped; replaced by a sweet sensation as the brew cools. Caused by a higher than normal percentage of acids perceived as sweet during modulation of the predominately sweet taste sensation. Typified by a Kenyan AA coffee.

Primary Coffee Taste Sensation Acidy, mellow, winey, bland, sharp, and soury. Created as the basic taste sensations interact with one another, depending on the relative strength of each. Results of the process of taste modulation and the basis of grouping together coffees of similar taste.

Rough A secondary coffee taste sensation related to *sharp*. Characterized by a predominately rasping, parching sensation on the anterior sides of the tongue. Caused by the additive property of salty taste sensations. Typified by an unwashed Angola Robusta coffee.

Salt A basic taste characterized by solutions of chlorides, bromides, iodides, nitrates, and sulfates of potassium and lithium. Perceived primarily by the fungiform and foliate papillae on the anterior sides of the tongue.

Secondary Coffee Taste Sensations Created when a single basic taste dominates the primary coffee taste sensations:
Acidy – piquant to nippy.
Mellow – mild to delicate.
Winey – tangy to tart.
Bland – soft to neutral.
Sharp – rough to astringent.
Soury – hard to acrid.

The temperature of the brew affects perception of the sensation.

Sharp A primary coffee taste sensation related to the presence of salt-tasting compounds. Created as acids in the coffee combine with salts to increase the brew's overall saltiness. A characteristic found most often in unwashed Robusta coffees, such as coffee from the Ivory Coast in Africa. Sharp coffees range from *rough* to *astringent*, with the taste sensation experienced on the sides of the tongue.

Soft A secondary coffee taste sensation related to *bland*. Characterized by an absence of any predominant taste sensation on any part of the tongue, except for a subtle dryness. Caused by a concentration of salts high enough to neutralize the acids but not high enough to neutralize the sugars. Typified by an unwashed Arabica coffee from Santos, Brazil.

Sour A basic taste sensation characterized by solutions of tartaric acid, citric acid, or malic acid. Perceived by the foliate and fungiform papillae in the posterior sides of the tongue.

Soury A primary coffee taste sensation related to the presence of sour-tasting compounds. Created as salts in the coffee combine with acids to reduce the brew's overall sourness. A characteristic found most often in unwashed Arabica coffees grown below 2,000 feet in Brazil, such as unwashed Arabica coffee from Victoria, Brazil.

Sweet A basic taste characterized by solutions of sugars (sucrose and glucose), alcohols, glycols, and some acids (amino acids). Perceived primarily by the fungiform papillae at the tip of the tongue.

Tangy A secondary coffee taste sensation related to *winey*. Characterized by a predominately darting, sour sensation along the anterior sides of the tongue. Caused by a higher than normal percentage of sugars, which gives the taste an almost fruity sensation. Typified by a high grown, *cherry* coffee from India.

Tart A secondary coffee taste sensation related to *winey*. Characterized by a predominately biting, sour sensation along the anterior sides of the tongue. Caused by a higher than normal percentage of sour acids giving the taste an almost puckering sensation. Typified by an unwashed Arabica coffee from Kivu, Congo.

Winey A primary coffee taste sensation related to the presence of sour-tasting compounds. Created as sugars in the coffee combine with acids to reduce the brew's overall sourness. A characteristic found most often in unwashed Arabica coffees grown above 4,000 feet, such as an unwashed Djimma coffee from Ethiopia.

STAGE III: COFFEE MOUTHFEEL

Mouthfeel is the tactile sense derived from physical sensations in the mouth during and after ingestion of a food or beverage. The density, viscosity, surface tension, and other physical and chemical properties of the material being sampled educe the sensations. The soft structures of the mouth have a network of free nerve endings, plus encapsulated and unencapsulated nerve terminations. The free nerve endings respond to touch and light pressure, as well as thermal, chemical, and mechanical stimulation.

The characteristic *feel* of food and beverage products is often one of the most important aspects of their quality. Firmness, softness, juiciness, or oiliness is measured in the mouth much as they would be measured by the finger. Continued release of flavor during the corresponding tactile sensation is both physiologically and psychologically important. If the flavor disappears or is exhausted before the food or beverage is ingested, an impulse to reject the food or beverage may develop.

In coffee, the tactile sensation in the palate comes from both the undissolved liquid material (fatty oils)-and the undissolved solid material-(sediment)-that remain suspended in the beverage after it is brewed. In addition to giving texture to the overall mouthfeel of the beverage, the suspended materials contribute to the flavor of the beverage through the formation of brew colloids*.

Fatty Oils

Green coffee beans contain between 7 and 17 percent fat, produced by the coffee shrub and stored in its seeds to provide sustenance for germination. Normally plants fats become oils above room temperature and are often used as cooking oils. Coffee oil is a mixture of triglycerides and is similar in composition to butter and cottonseed oil.

Triglycerides	Coffee Oil	Butter	Cottonseed Oil
Myristic	3%	–	1%
Palmitic	28%	28%	21%
Stearic	10%	25%	22%
Oleic	21%	39%	29%
Linoleic	28%	–	23%

Coffee oils play a subtle but important role in the overall presentation of coffee's flavor. First, they reduce the surface tension of the water in the beverage as the oil droplets are suspended in the fluid. This gives the coffee a smooth or creamy texture. Second, the oils carry other flavoring compounds, just as animal fat is the prime carrier for wood-smoke flavors in the smoking of hams and cheeses. The fats in coffee are also the prime carriers of foreign flavoring compounds that can taint the flavor of coffee. Finally, hydrogenation and oxidation of the fats are responsible for part of the major flavor changes that occur during the staling process, just as butter turns rancid when left in a warm, moist environment.

Sediment

The undissolved solid material, or sediment, comes from two sources. First, a small amount of bean fiber washes off the surface of the roast and ground particles, and remains suspended in the beverage. As gravity acts upon these micro-fine particles of bean fiber, they eventually settle out as sediment in the bottom of the cup.

Second, the remaining amounts of undissolved solid materials are insoluble proteins. The source of these proteins in the brew is the amino acids* present in the green bean. The proteins are formed as the amino acids combine to form larger molecules during the roasting process. Ultimately these protein molecules become so large that they are no longer water-soluble. These proteins result in the coffee "tars" that often build up into a dark, oily residue on the surfaces of coffee brewing equipment.

Brew Colloids

The oil and sediment suspended in the coffee beverage combine to form coffee brew colloids*, which are oily in nature. They help give coffee its texture as a beverage, just as dust and water vapor combine in the atmosphere to form clouds. As brew colloids they are adsorbing* and absorbing* other flavoring compounds, which contributes much to the synergism of coffee's flavor.

In their absorbing roles, the colloids adhere to thin layers of aromatic compounds, causing these gaseous materials to remain trapped in the beverage until the coffee is swallowed. In their adsorbing roles, the colloids act as buffering agents to produce a less acid cup, which can be detected by both taste and pH measurements. Formation of brew colloids accounts for the principal flavor differences between fresh-brew and instant coffees. In cupping coffee, the traditional method of sample preparation greatly increases the amount of brew colloids formed in the cup.

Passing coffee brews through paper filters removes most of the coffee colloid particles. However, small colloids

of less than approximately 1 micro-unit (mu) can pass through most filter papers. Continued heating also breaks down the stability of brew colloids; gravity separates them into an oily film on the surface of the brew and sediment on the bottom of the cup. Consequently, coffees that are directly heated for any length of time go through a flavor change that is the result of the breakup of brew colloids.

Body vs. Strength

The systematic description of a coffee's flavor concludes with the description of its body. This measures the tactile sensation perceived by the nerve endings in the mouth responding to the insoluble material – both liquid and solid – suspended in the coffee brew. Body should be differentiated from strength, which is an intensity measure of the amount and type of soluble material present. Strength gives coffee its taste characteristics, whereas body gives coffee its mouthfeel characteristics. *It is possible to brew coffees that have a heavy body, but not a strong taste.*

Coffee with a very low fat content and the presence of hard or nonbrittle bean fiber would be described as either water or thin. Coffees with a moderate fat content and some bean fiber splintered off during the grinding process would be described as either smooth or light. The terms *creamy* or *heavy* should refer to coffees with a relatively high fat content mixed with some splintered bean fiber. And buttery or thick would be appropriate adjectives for coffees with an extremely high fat content and high percentage of fiber material.

For example, the systematic description of a Coffee AA taken from a Full City Roast would end with the description of the overall mouthfeel, or body sensation. Because the fat content of Coffee AA is relatively high while the bean fiber is somewhat hard (with little splintering during grinding) the overall body sensation has a moderately pronounced creamy texture, but only a moderately perceptible heavy feel.

Mouthfeel Terminology

Body The physical properties of the beverage that result in the tactile sensations perceived on the tongue and skin in the mouth during and after indigestion.

Buttery A mouthfeel sensation denoting a relatively high level of oily material suspended in the brew. Most often a characteristic of coffees brewed under pressure such as espresso, resulting in substantial amounts of oil washed off the bean fibers.

Creamy A mouthfeel sensation caused by a moderately high level of oily material suspended in the coffee beverage – the result of pronounced amounts of fats in the green beans.

Heavy A mouthfeel term that describes coffee's body and denotes a moderately high level of solid material suspended in the coffee beverages – fine particles of bean fiber and insoluble proteins are present in pronounced amounts.

Light Describes coffee's body and denotes a moderately low level of solid material suspended in the brew – the result of fine particles of bean fiber and insoluble proteins present in perceptible amounts. Usually associated with low coffee-to-water ratio used for brewing.

Smooth A mouthfeel sensation caused by a moderately low level of oily material suspended in the coffee beverage. The result of moderate amounts of fats present in the green beans.

Thick A sensation caused by a relatively high level of solid material suspended in the coffee beverage. Most often a characteristic of espresso-style beverage, this is the result of the presence of substantial amounts of bean fiber particles and insoluble proteins.

Thin A sensation caused by a relatively low level of solid material suspended in the coffee beverage – the result of fine particles of bean fiber and insoluble proteins present in slightly perceptible amounts. Most often a characteristic of brews prepared through a paper-filtering device with a low coffee-to-water ratio for the brew formula.

Watery A sensation cause by a relatively low level of oily material suspended in the coffee beverage – the result of slightly perceptible amounts of fats present in the green beans. Most often a characteristic of brews with extremely low coffee-to-water ratios.

SECTION TWO:
FLAVOR TAINTS AND FAULTS

It is virtually impossible for the coffee bean, either green or roasted, to exist in a state of equilibrium,* or natural balance. Through the coffee bean's entire life span – from first appearing on the coffee shrub, to having its water soluble organic* and inorganic* materials consumed as a beverage – internal and external factors continually act upon it. If the influence of these factors is strong enough, a chemical change results that affects the ultimate flavor of the coffee brew.

If the change results in a minor flavor defect, usually limited to the aromatic properties of the flavor, it is referred to as a flavor taint. Whether a **flavor taint** is pleasing or displeasing depends on its type and degree, as well as the cupper's personal preference. If the chemical change results in a major failing, usually transmitted to the taste properties of the flavor, it is referred to as flavor fault. Flavor faults are almost always displeasing, regardless of the cupper's personal preference.

The terminology that describes the various taints and faults affecting coffee is best understood in the overall context of the origin of the taint or fault. For example, grassy, new crop, past crop, aged, strawy, and woody are all terms that reflect the degree of chemical change that has occurred as part of an aging process in the green bean after it has been harvested and dried and is awaiting shipment. A chemical change that results in a flavor taint or fault can affect coffee in any or all of the five distinct phases coffee undergoes in its transformation from seed to cup.

PHASE I: HARVESTING/DRYING

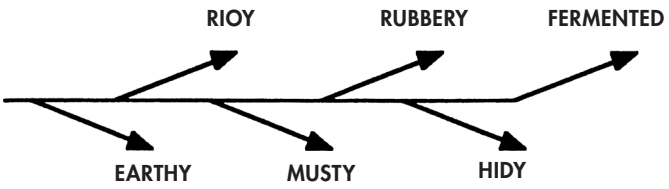
The first phase occurs during the harvesting of the coffee cherries, when the grower dries the green coffee beans or seeds, which may or may not have been removed from the fruit skin and pulp.

During the harvesting process, if the cherries remain on the shrub for too long under conditions unfavorable for the shrub's continued growth, enzymes in the cherries will begin to break down the food stored in its seeds. This chemical change produces a *rioy* flavor in Arabica beans and a *rubbery* flavor in Robusta beans. If the cherries or beans remain in a heated, moist condition during the drying process, enzymatic reactions inside the beans accelerate and cause a *fermented* flavor.

If the coffee beans are kept in a dirty environment, particularly if they are dried on the ground, the fats in the coffee beans will absorb odors from the dirt, resulting in an *earthy* flavor. Coffee beans that remain in a damp environment, particularly one that promotes mold growth, will absorb a *musty* flavor in their fats. A *hidy* flavor results when the coffee beans are heated too rapidly, particularly when mechanical drying is used, causing the fats to break down.

– DRYING PROCESS DURING HARVESTING →

Internal Changes Affecting The Acids



External Conditions Affecting The Fats

Proper drying is essential to avoiding taints and faults in green coffee.

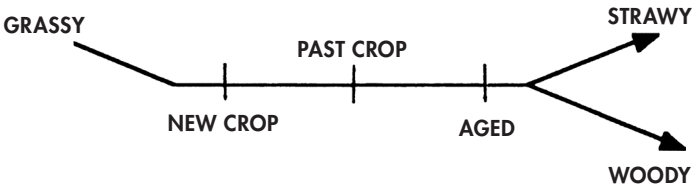
PHASE II: STORAGE/AGING

The second phase begins at the time the coffee beans have been dried after harvesting and ends when they are actually roasted. During the first few months after the harvesting, the coffee beans have a distinct herbal aroma and astringent taste, similar to freshly mown alfalfa, which is called *grassy*. Continuing enzymatic changes in the green bean diminish this flavor characteristic over several months. When ready to ship, it is often referred to as *new crop*.

If the coffee beans are stored under proper conditions, the enzymatic changes continue at a very slow pace. After approximately one year, these chemical changes begin to affect the acids within the coffee beans. When these changes become detectable in the palate, the coffee beans are referred to as *past crop*. If the beans remain in storage for several more years, the enzymatic activity greatly reduces the acid content and the coffee beans are referred to as *aged*.

In addition to experiencing enzymatic activity, the coffee beans slowly lose organic material and gradually develop a *strawy* flavor similar to dried hay. Over a period of years, the coffee undergoes a substantial loss of organic material, referred to as *woody*, ultimately developing an unacceptable taste.

— AGING PROCESS AFTER HARVESTING →



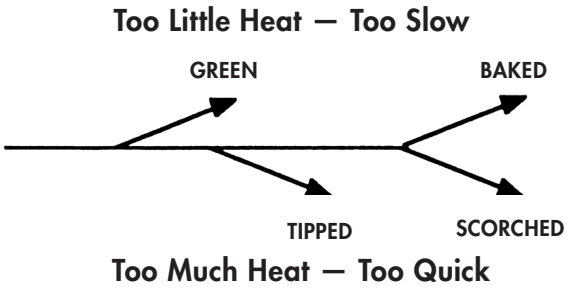
When coffee reaches the point of tasting woody, it's no longer commercially usable.

PHASE III: ROASTING/CARAMELIZATION

The third phase of chemical change occurs during the roasting process. As the roasting temperature approaches 400ºF, the sugars inside the beans undergo a series of chemical changes: they combine with the other organic and inorganic material in the beans and ultimately become a brown mass known as caramel. The chemical changes follow distinct pathways, with the amount and rate at which heat is applied as well as the sugars present in the green beans, affecting the ultimate flavor compounds.

If the caramelization process does not proceed far enough due to low heat, the roasted coffee beans retain an herbal flavor. This flavor characteristic is reminiscent of a green vegetable, such as green peas, and is referred to as *green*. If heating proceeds too slowly, the roasted beans will have a flat aroma and vapid nose, which is called a *baked* flavor. If heat is applied too quickly – as evidenced by charring at the tip of the beans – not all of the chemical reactions take place, giving the coffee beans a *tipped* flavor. When too much heat is applied the surface of the beans chars and a *scorched* flavor results.

— CARAMELIZATION PROCESS DURING ROASTING →



Improperly applied heat interferes with the caramelization process.

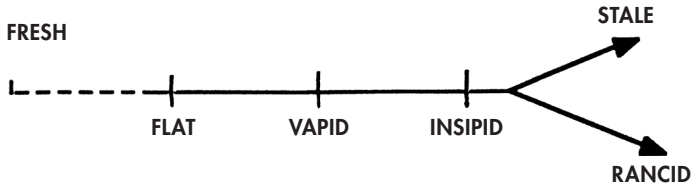
PHASE IV: POST-ROASTING/STALING

The fourth phase in which coffee undergoes flavor change occurs during the staling process, after the beans have been roasted. The coffee starts out fresh, meaning it has a full complement of aromatic compounds, particularly the most volatile* mercaptans, or sulfur-containing compounds. The change is most noticeable as a loss of fragrance from the ground coffee.

As the staling process continues, more of the volatile organic material is removed from the coffee beans through the release of carbon dioxide gas, which dissolves aromatic compounds trapped in the bean fiber. A loss of aroma from the coffee brew characterized by this change, and the resulting coffee, is referred to as *flat*. Continued staling causes further loss of volatile* organic material that ordinarily would be part of the vapors contributing to the nose of the brew. When this occurs, the coffee is called *vapid*.

If moisture and oxygen penetrate the coffee bean, further changes occur. First, there is an oxidation of the oils in the coffee beans. Most noticeable in the taste of the brew, this change is referred to as *insipid*. Second, continued exposure to oxygen and moisture accelerate the oxidation of the linoleic triglyceride, changing the taste from pleasant to unpleasant, a condition referred to as *stale*. Finally, the oxygen and moisture react with the fats in the coffee beans, causing them to take on a distinctly offensive character that is called *rancid*.

— STALING PROCESS AFTER ROASTING →



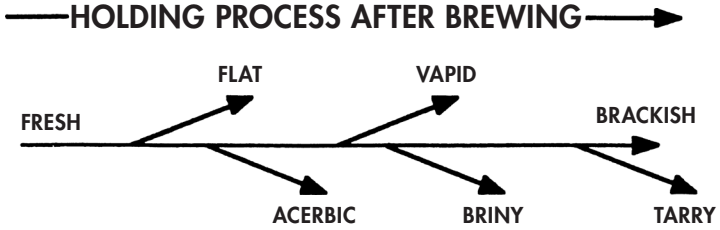
The first indication that coffee is no longer fresh is a loss of fragrance from the ground coffee.

PHASE V: POST-BREWING/HOLDING

During the post-brewing/holding period, coffee flavor changes faster than at any other point in the process of transforming green beans into a consumable beverage. Brewed coffee starts out as *fresh*, meaning it has a full complement of the volatile organic compounds that make up the aroma of the brew. As the brew continues to heat in an open container, the vigorous molecular action caused by the elevated temperature drives out the gaseous material. Brewed coffee first loses its aroma and becomes *flat*. Continued heating causes the remaining volatile material to evaporate, and the coffee becomes *vapid*.

Prolonged heating also affects the organic compounds that remain in solution. The longer-chain organic compounds break into shorter-chain compounds, which increases the overall acidic taste, and is referred to as *acerbic*. This effect is particularly evident in the chlorogenic acid in the

coffee. Next, water evaporates from the brew, condensing the salts in the beverage to give it a *briny* character. In addition, continued heating burns or scorches the proteins, suspended in the brew as colloids, giving the old coffee a *tarry* flavor. Finally, the alkaloids in the brew become so concentrated that their bitterness combines with the salts to present a *brackish* flavor.



In the post-brewing period, coffee's flavor changes faster than at any other point in the transformation process.

EXTERNAL CONTAMINATION OF FLAVOR

Many of the flavor taints and faults associated with coffee are the result of contamination from outside sources, and are not part of the natural chemical reactions within the beans before, during, or after the roasting process.

For two reasons, coffee beans tend to transmit unwanted flavors easily. First, the coffee bean's fiber tends to be hydroscopic – it readily absorbs moisture, thereby absorbing the chemical compounds present in the water vapor as well. Second, the fats in the coffee beans, like all fats, find and hold chemical compounds that are gaseous at room temperature. The fats absorb the odor molecules from the surrounding air and retain them until they are released in the brew as the fats dissolve into oils. The result is a wide range of off-flavors, too numerous to mention, that can become part of the coffee brew's flavor.

In addition to visually examining a green coffee sample, a cupper evaluates the odor by placing the sample close to his or her nose and sniffing deeply several times. In many instances, a cupper first detects contamination from external sources as foreign odors in the green coffee sample.

EXTERNAL CONTAMINATION FROM WATER

In some situations, organic and/or inorganic material in the coffee combines with inorganic material in the water used for brewing, creating a completely new set of chemical compounds found neither in just the water nor the coffee. These new chemical compounds usually have displeasing taste characteristics that tend to be medicinal or metallic in character. Chlorine residues are the most common type of external contamination from water.

TAINTS AND FAULTS TERMINOLOGY

Acerbic — A taste fault in the coffee brew giving an acrid and sour sensation on the tongue. Created by chlorogenic acid compounds breaking into shorter-chain quinic and caffeic acids due to excessive heat during the holding time after brewing.

Aged — A taste and mouthfeel taint that gives coffee beans a less acidy taste but greater body – the result of enzyme activity in the green coffee beans creating a physical change during the aging process while the beans are stored after harvesting.

Baked — A taste and odor taint that gives the coffee brew a flat bouquet and insipid taste. Occurs when the roasting process proceeds with too little heat over too long a period, causing the caramelization process to follow chemical pathways that do not develop flavorful compounds.

Brackish — A taste fault in the coffee brew that produces a salty and alkaline sensation. Results when water evaporates from the brew due to excessive heat, leaving a concentration of mineral oxides (salt-like) and alkaline inorganic material.

Briny — A taste fault giving coffee brews a salty sensation. Results when excessive heat is applied after brewing, leading to water evaporation and a concentration of astringent tasting inorganic marterial.

Earthy — An odor taint in the coffee beans that produces a dirt-like aftertaste – the result of fats in the coffee beans absorbing organic material from the ground in the drying process during harvesting. Also referred to as "dirty" or "groundy."

Fermented — A taste fault in the coffee beans that produces a highly displeasing sour sensation on the tongue – the result of enzyme activity in the green coffee beans changing the sugars to acetic acid (vinegar) in the drying process after harvesting.

Flat — An odor taint that results when aromatic compounds leave the beans as part of the staling process after roasting, or leave the brew as part of the holding process after brewing.

Fresh An aromatic highlight in the coffee bean or brew that is highly pleasing. The result of extremely volatile organic compounds, particularly those containing sulfur, evoking a highly pleasing sensation on the olfactory membranes.

Grassy A taste and odor taint giving the coffee beans a distinct herbal character similar to freshly mown alfalfa combined with the astringency of green grass. Created by the prominence of nitrogen-containing compounds in the green beans developed while the cherries are maturing.

Green A taste that gives the coffee brew an herbal character. Caused by incomplete development of the sugar-carbon compounds in the roasting process because of insufficent heat applied during too short a period.

Hidy An odor taint in the coffee beans that produces a tallowy and leather-like odor. A result of the breakdown of fats in the coffee beans, this occurs when an excessive amount of heat is applied in the drying process – common to a mechanical drying-during harvesting.

Insipid A taste taint that gives the coffee brew a lifeless character due to a loss of flavor compounds. This loss of organic material in the coffee beans is the result of oxygen and moisture penetrating the bean fiber during the staling process after roasting, but before brewing.

Musty An odor taint giving the coffee beans a moldy smell – a result of fats in the coffee beans absorbing organic material from molds (fungus) on, or in contact with, the coffee beans during the drying process. Also referred to as *moldy*.

New Crop A taste taint that gives the coffee beans a slightly herbal character when brewed – a result of an incomplete enzymatic change in the green beans during the aging process after harvesting and drying. Continued storage (allowing the coffee to "rest" three to six months) ultimately eliminates this taste taint.

Past Crop A taste taint giving the coffee beans a slightly less acidy taste characteristic. Occurs because of enzymatic changes in the coffee beans during the aging process, one or more years after harvesting.

Quakery A taste taint that gives the coffee brew a pronounced peanutty flavor. Caused by picking unripe, green coffee cherries during harvesting that remain very light colored and under developed beans when roasted.

Rancid A taste fault giving the brew a highly displeasing taste – a result of moisture and oxygen causing a chemical change in the oils of the roasted coffee beans that occurs during the staling process following roasting.

Rioy A taste fault that produces a highly pronounced medicinal (iodine-like) characteristic in the brew. Usually associated with natural processed Arabica coffees grown in Brazil and shipped through Rio de Janeiro. Result of bacteria induced enzyme activity that continues in the fruit when the fruit is allowed to partially dry on the shrub.

Rubbery A taste fault giving the coffee beans a highly burnt-rubber character. Usually associated with natural processed Robusta coffees grown in Africa, this occurs because of continued enzyme activity in the fruit when the fruit is allowed to partially dry on the shrub.

Scorched An odor taint giving the coffee brew a slight aftertaste of a phenolic and pyridine (smoky-burnt) character with an underdevelopment of the caramelization compounds – the result of applying too much heat too quickly, and charring the surface of the bean during roasting.

Stale A taste fault giving the brew an unpleasant taste – a result of moisture and oxygen penetrating the bean fiber and adversely affecting the organic material that remains in the coffee bean. Occurs in the staling process after roasting.

Strawy A taste taint giving the coffee beans a distinct hay-like character. Results from the loss of organic material from the green beans while in storage and occurs during the aging process after harvesting.

Tarry A taste fault in the coffee brew producing an unpleasant burnt character. A result of excessive heat scorching the proteins in the brew. Occurs during the holding process after brewing.

Tipped A taste taint giving the coffee brew a cereal-like taste-a result of heat applied too quickly in the roasting process, which chars the tips of the coffee beans.

Vapid An odor taint in the coffee brew marked by a loss of organic material that would normally be gaseous in both the aroma and nose. The result of elevated temperatures driving out gaseous molecules trapped in the brew during the holding process after brewing. Can also occur during the staling process after roasting.

Wild A taste fault in the coffee beans characterized by extreme variation between sample cups, usually marked by unpleasant sourness. Results from either internal chemical change in the green beans or external contamination.

Woody A taste fault in the coffee beans that produces a distinct, unpleasant, wood-like character. A result of an almost complete loss of organic material in the green beans during storage, as the final change during the aging process. Makes the coffee commercially unusable.

SECTION THREE:
CUPPING METHOD

Coffee cupping is a method used to systematically evaluate the aroma and taste characteristics of a sample of coffee beans. The method consists of a prescribed manner of brewing and a series of steps that lead to a complete sensory evaluation by the coffee cupper's olfaction, gustation, and mouthfeel sensations. Because cupping is usually associated with an economic purpose, such as buying or blending of coffees, its practitioners rigorously follow these procedures and techniques.

SAMPLE PREPARATION

Coffee beans are ground into a "fine" grind, in which approximately 70% - 75% of all the particles pass through the U.S. Standard Size 20 sieve. The purpose of this grind standard is to achieve an 18% - 22% extraction rate from the roast and ground coffee. Empirical testing has identified this as the optimum extraction range for balancing all of the flavoring compounds removed from the coffee.

Because water accounts for approximately 99% of the coffee brew, the importance of the water quality used for sample preparation cannot be overemphasized. The water should contain between 100 - 200ppm (parts per million) dissolved minerals — the same level of water hardness found in "crystal fresh" drinking water. Distilled water is not recommended. In addition, filter out any chemical added for water treatment, particularly chlorine. Water quality cannot be taken for granted, and it must be checked to ensure accurate sensory perceptions. *The SCAA Water Quality Handbook* is recommended for further relevant information.

Coffee for each sample cup should be prepared and pre-portioned by weight in whole-bean form and ground individually so as to isolate any defect to a single cup, rather than be dissipated among multiple cups. Additionally, a "flush" portion of a coffee sample should be ground and discarded before grinding for cupping to displace any grounds retained from the previous sample by the grinder.

The coffee-to-water ratio in each sample cup must remain constant, most often set at 8.25 grams of coffee (the original weight of one nickel and one dime) to 150 mLof water (approximately 5 fluid ounces). This presents the coffee's flavor in the strength range of 1.1% - 1.3% dissolved solids. It is equivalent to using a coffee-to-water ratio of 3.75 ounces of coffee per 64 fluid ounces of water in the half-gallon brewer, or using 1 pound of coffee with 2.25 gallons of water in an urn.

The brewing method is infusion: Nearly boiling water (195° - 205ºF) is poured directly onto the roasted and ground coffee particles contained in a small cup. The particles initially rise to the surface of the water to form a crust or cap. As the coffee particles steep in the hot water, they begin to sink.

The infusion process continues for three to five minutes: Break the cap and firmly stir the coffee to ensure that all the particles become thoroughly wetted and sink to the bottom of the cup. Those that do not are skimmed off the surface of the brew and discarded. In this method of brewing, nothing is done to filter the coffee or otherwise interfere with the extraction of the flavoring material from the coffee grounds.

SENSORY EVALUATION

The physical motions involved in each step of the evaluation process, such as sniffing, slurping, and swallowing are greatly exaggerated beyond the normal levels of everyday eating and drinking. The purpose of exaggerating these physical actions is to saturate as many nerve endings as possible with the appropriate stimulus from the coffee in order to evoke a complete flavor sensation. Although such behavior would be considered rude in other settings, it is quite essential at the cupping table.

Coffee cupping consists of six steps, which evaluate a coffee's fragrance, aroma, taste, nose, aftertaste, and body.

1. Fragrance. The first step in the cupping method is to evaluate the fragrance of the coffee beans. Grind enough 8.25-gram samples to place in 3 - 5 sampling cups, and then vigorously sniff the gases released as the carbon dioxide leaves the newly ruptured bean cells.

The character of the fragrance indicates the nature of the taste: Sweet scents lead to acidy tastes, and pungent scents lead to sharp tastes. The intensity of the fragrance reveals the freshness of the sample, meaning the time that elapsed between roasting the sample and then grinding it.

The fragrance is composed of the most volatile aromatic compounds, particularly those containing sulfur, such as methyl marcaptans. Little can be done to keep these trapped within the coffee bean for any length of time.

2. Aroma. The second step involves examining the aroma of the coffee brew. First pour 150 mL of fresh (oxygenated) nearly boiling water over the newly ground coffee beans, and allow the roast and ground coffee particles to steep for approximately three minutes. The coffee particles will form a crust, or cap, on the surface of the brew.

As this cap is broken by firmly stirring with the cupping spoon, the gases formed as the result of the elevated temperature of the water are vigorously sucked up into the nasal cavity by a long, deep sniffing action. This action accesses the full range of the aromatic character of the sample being tested, from fruity to herbal to nut-like scents. Cupping experience leads cuppers to categorizing each unique pattern in their odor memories, and they use these distinctive odor patterns as a means of distinguishing one type of coffee from another.

Generally speaking, the range of the coffee's aromatic character corresponds to the origin of coffee. In contract, the intensity of aromatic character relates to the freshness of a coffee, as measured by the length of time between roasting and brewing, depending on the type of packaging used to provide moisture and oxygen protection for the beans.

3. Taste. Scrutinizing the taste of the freshly brewed coffee is the third step in the cupping process. Using a special cupping spoon – usually a rounded soup spoon, capable of holding 8 - 10 cc (cubic centimeters) of fluid, which has been silver plated to rapidly dissipate heat – raise a 6 - 8 cc portion (approximately one third of a fluid ounce) of the coffee brew just in front of the mouth, and forcefully slurp the fluid. Briskly aspirating the fluid in this manner spreads it evenly over the entire surface of the tongue. All the sensory nerve endings simultaneously respond to the sweet, salt, sour, and bitter sensations of the brew, allowing for a complete modulation of the taste.

Because temperature affects how the stimulus is perceived, noting where it is sensed can also help reveal its character. For example, because temperature decreases the sweetness of sugars, acidy coffees tends to present first as a tingling sensation on the tip of the tongue, rather than a sweet one. Hold the coffee in the mouth for three to five seconds, and focus the type and intensity of the taste sensation. In this manner, the primary and secondary taste characteristics can be evaluated.

4. Nose. The fourth step is done simultaneously with the third. The aspiration of the coffee brew across the surface of the tongue also aerates* it, causing a portion of the organic compounds present in the liquid phase to change into a gaseous phase because of the change in vapor pressure. The forceful sucking actions draws these gasses up into the nasal cavity and enables the cupper to analyze the nose of the coffee brew.

This *simultaneous assessment of the taste and nose* (vapors) gives the coffee sample its own unique *flavor.* In standard-roast coffees, the nose tends to reflect the flavor characteristics of sugar-browning by-products. In dark-roast coffees, the nose tends to exhibit the flavor characteristics of dry distillation by-products.

5. Aftertaste. The fifth step, sifting out the aftertaste of the coffee brew, is done by swallowing a small portion of the sample after it has been held in the mouth for a few seconds. By rapidly pumping the larynx to force up into the nasal cavity the vapors lingering on the back of the palate, the odor of the heavier molecules remaining on the palate can be assessed along with the taste sensations.

The flavor compounds found in the aftertaste may have a sweet characteristic reminiscent of chocolate; they may resemble campfire or pipe tobacco smoke; they may be similar to a pungent spice, such as clove; they may seem resinous, reminiscent of pine sap; or they may exhibit any combination of these characteristics.

6. Body. The cupping method concludes by evaluating the fluid to determine its mouthfeel. In this process, the tongue gently slides across the roof of the mouth, eliciting a tactile sensation. The oiliness, or slipperiness, of the

sensation measures the fat content of the brew, while the sensation's "heft," thickness and viscosity, measures the fiber and protein content. Combined, the two sensations constitute the brew's body.

As the coffee brew cools, repeat steps 3 through 5 (taste, nose, and aftertaste) at least two or three times. Allowing the coffee to cool compensates for the various ways in which temperature affects the basic tastes, so a more accurate overall taste impression is gained by repeated tasting of the brew.

In the cupping ritual, between 3 and 5 cups of each sample are prepared and tasted simultaneously. This method of comparison normally tests for uniformity, or likeness, between the samples. In testing for uniformity, the cupper is attempting to assess the consistency of the lot of coffee being evaluated. Differences between the cups indicate a non-uniform lot, which is often regarded as a serious quality failing.

In the cupping ritual, it is also customary to juxtapose (compare side-by-side) at least two different samples of coffee beans, with cuppers sometimes judging up to six to eight different coffees at the same time. This comparative method of sampling not only helps bring out the subtle flavor differences between the coffee beans, but also helps the cupper build a flavor memory to call upon in future cuppings. When more than eight samples are to be evaluated, it is best to break them out into smaller sets.

When cupping large numbers of samples, a coffee cupper customarily expectorates into a cuspidor the portion of the brew that is not swallowed. This helps clear the palate for the next sample to be tested. In addition, rinsing the mouth with small amounts of tepid water helps prepare it to gain a more accurate assessment of the taste of the next sample. Every cupper has a limit to the number of samples that can be effectively evaluated before odor and taste fatigue diminish the ability to discriminate accurately.

Finally, remember that a person's mindset also affects their ability to associate taste or odor stimulations with the corresponding taste or odor sensation in their memory. Therefore, keep the cupping room free from outside interferences, especially sights, sounds, and smells. In addition, completely concentrate on the task at hand, which should include making some type of written record for each sample evaluated.

LEARNING HOW TO CUP

Good cupping skills are developed through practice, training, and experience. Practice is necessary to instill the basic mechanics of preparing, smelling, and tasting samples by means of an identical process each and every time coffee is cupped. Training is needed to build the sensory acuity and flavor memory required when making fine distinctions between similar samples. And experience is required to learn all of the variations in flavor characteristics that coffees exhibit due to the differences in their origins, processing methods, storage conditions, and roasting nuances.

Perfect practice leads to perfect execution. Perfect practice means starting with the right equipment. A good cupper will take the time to set up a proper cupping station, which will include all of the equipment needed to do the cupping. It is extremely important to use the same equipment each time so that the results between cuppings done on different days are comparable. Perfect practice means that the water used to prepare the samples is of the right quality and has not been contaminated with chemicals, especially chlorine. Perfect practice also means taking the necessary time to focus on the activity, so that all of the senses are exercised, the flavor memory is engaged, and the results are recorded for future reference.

Training should consist of both formal training programs and/or classes, combined with informal training with other coffee cuppers. Cupping coffee with other knowledgeable people, particularly the opportunity to share information and terminology is an invaluable experience. Good cuppers will take every opportunity to learn from others, and great cuppers will use every opportunity to share the skills and knowledge they have acquired over time.

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word helps imprint the sensation in the brain's flavor memory. *(See: Grading Form-Single Sample in Section Four of this book.)*

CUPPING FORMS

Three different guidelines for recording the various flavor sensations in coffee are presented in Section Four. The first is a (Star or Spider Diagram) technique that allows for 16 different sensory and quantitative attributes to be displayed in a single visual reference. The second is a Grading Form for a single sample that can also serve as a training guide for first time cuppers, showing them how to make a complete sensory assessment of the coffee brew. The third is SCAA's Cupping Form, used for comparative grading of multiple samples.

For scientific studies on the organoleptic characteristics of coffee, the spider diagram is an invaluable tool for recording links between the quantitative data developed through the objective measurement and the sensory data recorded from any given subjective evaluation of the brew. It is a way of relating roast colors to *Acidity*, soluble solids to *Body*, and pH to *Balance*.

For creating written records for future reference, cupping forms create the opportunity to assign a numerical value to a sensory dimension. The numerical comparison provides an easy means for future reference. Although sensory perception of any stimulation is a logarithmic function (See: Fechner's Law in Section Four), comparative evaluation of two or more samples is greatly facilitated with the assignment of a numerical score. For purposes of cupping competitions as well as a more universal classification system, SCAA has developed a standardized scoring method using a 100-point basis, similar to a wine scoring scale.

In addition to practice and training, experience is also necessary in order to become a qualified cupper. Experience in tasting Arabica verses Robusta coffees, in tasting similar types of coffees grown at different altitudes, in tasting similar types processed in different methods, in tasting well prepared verses poorly prepared coffees is essential. Experience is essential in developing a complete flavor language and comprehension of the tremendous number of flavor nuances that hide in the background of general smell and specific taste sensations we know as coffee. Gaining this type of experience takes time. There are no short cuts. If a cupper has never experienced a coffee that remained too long in the fruit pulp, too long in the fermentation tank, or too long in the dryer, it is impossible to describe the subtle and not so subtle flavor differences these processing glitches can create.

TRAINING TOOLS

There are a number of ***training tools*** that have been developed in the past few years that can greatly accelerate the learning process. In addition to a few flavor recognition exercises that can be created with common grocery-store items (See: Appendix II in Section Four), The Specialty Coffee Association of America offers two *coffee flavor training kits* that focus on odor and taste recognition.

Coffee's flavor often includes a combination of two or three modalities, mixtures of salt, sweet, and sour. Combinations of sugar, salt, and citric acid can provide the novice cupper with an opportunity to develop the skills of tasting different mixtures and intensities with out the distraction of aromatics. Citric acid (lemon juice), acetic acid (vinegar), sucrose (sugar), and sodium chloride (table salt) can all be used to simulate sour, sweet, and salty taste sensations. By preparing reference solutions on the order of 0.1% - 0.3% for sour, 5.0% - 15.0% for sweet, and 0.25% - 0.75% for salt, exercises can be created that help the beginning cupper recognize different intensities as well as different combinations of basic tastes. Unfortunately there is no household product that replicates the unique bitterness that is characteristic of coffee's flavor.

The Specialty Coffee Association of America distributes a Taste Training Kit developed by Dolf DeRovira of Flavor Dynamics, Inc. This training kit contains three *standard taste concentrates* for Salt, Sweet, and Sour. It provides examples the twelve *standard flavor concentrates*, including Peanutty, Caramelly, Earthy, Herby, Fruity, Spicy, Winey, Chocolaty, Floral, Grassy, Nutty, and Turpeny. The cupper uses the kit to improve flavor recognition skills by adding "drops" of a concentrate into a standard reference coffee solution until the particular flavor characteristic reaches the recognition threshold. It is an excellent method of increasing a cupper's sensitivity to particular flavor characteristics and building rapid flavor recognition of their presence in coffee.

The Specialty Coffee Association of America also distributes an Aroma Training Kit developed by Jean Lenoir, a French wine expert, on behalf of the Colombian Coffee Federation. This kit consists of thirty-six individual vials of *aroma concentrates* that illustrate the basic coffee aromas found as *enzymatic*, *sugar-browning*, and *dry distillation by-products* in coffee's fragrance, aroma, nose and aftertaste, as well as common *aroma taints* encountered at the cupping table. It is a tremendous tool for building aroma recognition and flavor memory skills.

The opportunity to develop good cupping skills is far greater today than at any point in the coffee industry's history. Every individual who aspires to become a coffee professional needs to learn how to cup.

VISUAL AIDS

SCAA has produced a number of visual aids to assist in the cupping process. These visual aids consist of posters depicting geographic origin, classification methods, and word usage. They include:

- Specialty Coffees of the World (Map)
- Green Coffee Classification System
- Green Coffee Grading Method & Defects
- Coffee Taster's Flavor Wheel
- The Art of Aroma Perception in Coffee

These aids provide quick and easy visual reference to the basic concepts and flavor language association in cupping coffee.

SECTION FOUR:
ATTRIBUTE SCALING

A RANKING AND RATING SYSTEM

Traditionally coffee has been evaluated through a rating system in which (1) Aroma, (2) Acidity, (3) Body, (4) Flavor, and (5) Aftertaste received some type of numerical score. Typically Acidity and Body were considered an intensity or strength assessment, while Aroma, Flavor, and Aftertaste were given some manner of preference or acceptability rating.

In making consistent evaluations in coffee, it is critically important that the cuppers understand which type of assessment they are being asked to make before they proceed with their evaluations.

Rating: In cupping coffee, Aroma – the aromatic complexity; Flavor – the combination of taste and aroma (nose) in the palate; Balance – the overall flavor impression that assesses the degree to which various tastes and aromas fit together; and Aftertaste – the taste and aromatic sensations lingering in the mouth, should receive a *preference rating*, which on a scale of 1-10 extends from Very Poor to Outstanding.

Ranking: In cupping coffee, there can also be a number of attributes that can or should receive and *intensity ranking*, which on a scale of 1-10 extends from Imperceptible to Intense. Normally, these attributes include Astringency, Acidity, Aromatic Pungency – (often associated with the *nose* of the brew), and Body(the *mouthfeel* of the brew). In addition, the intensity of the basic tastes, Sweet, Sour, Bitter, and Salt (generally categorized as *Other*) can be given an intensity ranking.

Special Descriptors: The *ranking scale* for Acidity is on a scale of 1-10, which extends from Very Flat to Very Bright, while the *ranking scale* for Mouthfeel (Body) is on a scale of 1-10, which extends from Very Thin to Very Heavy.

Quantitative Measurement: In cupping coffee, it is always best to include "*quantitative measurements*" of the product being evaluated, which can be later used in assessing the scores of the "*rating and ranking*" of the various sensory attributes. These "*quantitative measurements*" should include the roast color, pH(hydrogen ion concentration), brew strength-(or solubles concentration), and any other critical stimulus under consideration.

Descriptive Analysis: Once the data has been carefully and systematically tabulated, the results can be plotted on a "*spider*" *(or Star) Diagram* in order to create a visual picture of which quantitative dimensions and ranking attributes are leading to the favorable or preferred *rating attributes* of the cuppers.

PREFERENCE RATING DESCRIPTORS

Scale	Attribute	Word Anchors
1-10	Flavor	Very Poor-Outstanding
1-10	Complexity	Very Poor-Outstanding
1-10	Balance	Very Poor-Outstanding
1-10	Aftertaste	Very Poor-Outstanding

INTENSITY RANKING DESCRIPTORS

Scale	Attribute	Word Anchors
1-10	Sweet	Imperceptible-Intense
1-10	Sour	Imperceptible-Intense
1-10	Bitter	Imperceptible-Intense
1-10	Other (Salt)	Imperceptible-Intense
1-10	Astringency	Imperceptible-Intense
1-10	Pungency	Imperceptible-Intense

SPECIAL DESCRIPTORS

Scale	Acidity	Mouthfeel (Body)
1	Very Flat	Very Thin
2	Flat	Thin
3	Very Soft	Very Light
4	Soft	Light
5	Slightly Sharp	Slightly Full
6	Sharp	Full
7	Very Sharp	Very Full
8	Slightly Bright	Slightly Heavy
9	Bright	Heavy
10	Very Bright	Very Heavy

Fechner's Law: Dr. Fechner was a psychophysicist who studied the relationship between stimulus and perception. In 1860 he derived a mathematical formal demonstrating that an individual's perception of any given stimulus was logarithmically proportional to that stimulus.

Fechner selected as his measure of the strength of sensation the *Just Noticeable Difference (JND).* For example, he would regard a perceived sensation of 8 *JNDs* as twice as strong as one of 4 *JNDs* (see diagram in opposite column). *JNDs* had just become accessible to measurement through difference testing, which Fechner learned from Ernst Weber at the University of Leipzig in the mid-1800s. Weber found that the difference thresholds increase in proportion to the initial perceived absolute stimulus intensity at which they are measure:

$$\frac{DC}{C} = k \text{ (Weber's Law)}$$

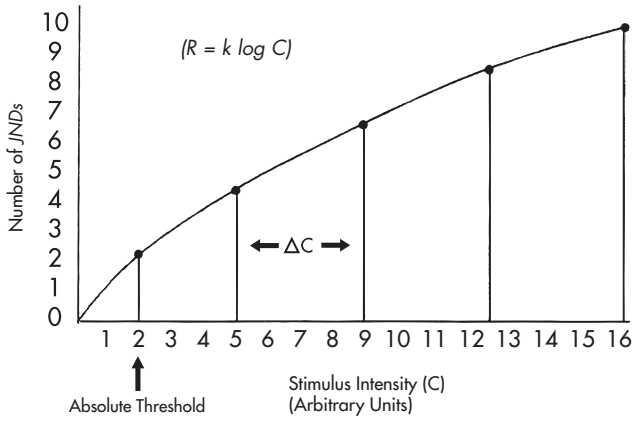
where C is the absolute intensity of the stimulus, e.g. concentration, DC is the change in intensity of the stimulus that is necessary for 1 JND, and k is a constant, usually between 0-1. Weber's law states, e.g., that the amount of an added flavor, which is just detectable, depends on the amount of that added flavor that is already present. If the k has been determined, we can calculate how much extra flavor is needed. The actual derivation of Fecher's law,

$$R = k \log C \text{ (Fechner's law)}$$

is complex and depends on the number of assumptions, some of which may not hold (Norwich and Wong, 1997). Support for Fechner's law is provided by common categories of scaling. When panelists score a number of samples that vary along one dimension (say, sweetness) using a scale such as 0-10, the results plot out as a logarithmic curve on a scale of 0-16 (shown below). One tangible outcome of Fechner's theories was a logarithmic scale of sound intensity, the Decibel Scale.

COFFEE ATTRIBUTE SCALING

Fechner's Law



COFFEE ATTRIBUTE SCALING

No.	Fechner Scale	Intensity Ranking	Preference Rating
0	0.00	Not Ranked	Not Rated
1	0.25	Imperceptible	Very Poor
2	2.00	Threshold	Poor
3	3.75	Very Slight	Acceptable
4	5.50	Slight	Fair
5	7.25	Mild	Average
6	9.00	Moderate	Good
7	10.75	Distinct	Very Good
8	12.50	Strong	Fine
9	14.25	Very Strong	Excellent
10	16.00	Intense	Outstanding

SPIDER DIAGRAMS

One of the most useful means of creating a visual combination of sensory *and* quantitative data is by means of "Spider" or "Star" diagram. Using this concept, ranking, rating, and quantitative numbers can be recorded along different axis emanating from a central point. By connecting the data points with a straight line, a visual flavor profile for the individual coffee is created. A complete set of data for coffee would include:

Intensity Ranking	Preference Rating	Quantitative Measurement
Sweet	Flavor	Roast Color
Sour	Complexity (Aroma)	pH
Bitter	Balance (Overall)	Solubles
Other (Salt)	Aftertaste	Other Stimulus
Astringency		
Acidity		
Aromatic Pungency (Nose)		
Mouthfeel (Body)		

In this technique, the *vertical and horizontal axis* are formed by the rankings for *sweet*, *sour*, *bitter*, and *other (salt)*; and the diagonal axis are formed by the quantitative measurements of *roast color*, *pH*, *critical stimulus*, and *solubles concentration*, where the critical stimulus can be a number of different quantitative aspects of the coffee being charted. To this basic diagram, four additional ranking attributes: *astringency*, *acidity*, *aromatic pungency*, and *mouthfeel*, can be added, as well as four additional rating attributes of *flavor*, *aromatic complexity*, *balance*, and *aftertaste*. (See diagram on page 30.)

Use of the spider diagramming technique does not require that all the data points for all the axis points be developed. It is only important that the same data axes are used when making comparisons between products. It can

be a very powerful technique in evaluating how changes in a key variable, say roast color for example, moves the sensory impact for any given product.

CUPPING FORMS

Maintaining some type of written record pertaining to the sensory evaluation of coffee can be an important aspect of building cupping skills. The record can be as simple as a few numbers recorded on a small card attached to the sample tray; a short form kept in a notebook, or a universal cupping form developed by the Specialty Coffee Association of America.

As a minimum, these forms should contain evaluations for the coffee's *aroma*, *acidity*, *flavor*, *balance*, *body*, and *aftertaste*. Examples of these types of forms are provided in this text, along with a complete explanation on how to use the SCAA Cupping Form.

SCAA Cupping Form

Form: A Sample of the SCAA Cupping Form is presented on page 32.

The purpose of the SCAA Cupping Form is to determine the cupper's perception of the quality of a coffee. The quality of specific flavor attributes is analyzed, and then drawing on the cupper's previous experience, samples are rated on a numeric scale. The scores between samples can then be compared. Coffees that receive higher scores should be noticeably better than coffees that receive lower scores.

The Cupping Form provides a means of recording important flavor attributes for coffee: *Fragrance/Aroma, Flavor, Aftertaste, Acidity, Body, Balance, Uniformity, Clean Cup, Sweetness, Defects,* and *Overall*. The specific flavor attributes are positive scores of quality reflecting a judgment rating by the cupper; Defects are negative scores denoting unpleasant flavor sensations; the Overall score is based on the flavor experience of the individual cupper as a personal appraisal. These are rated on a 16-point scale representing levels of quality in quarter point increments between numeric values from 6 to 9. These levels are:

QUALITY SCALE

Good	Very Good	Excellent	Outstanding
6.00	7.00	8.00	9.00
6.25	7.25	8.25	9.25
6.50	7.50	8.50	9.50
6.75	7.75	8.75	9.75

Theoretically, the above scale ranges from a minimum value of 0 to a maximum value of 10 points. The lower end of the scale is below specialty grade.

SCAA Cupping Protocols

Cupping Glasses | The SCAA recommends a 6.5 to 9 fluid ounce* (207ml to 266ml) glass cup or porcelain bouillon bowl, with a diameter between 3" to 3.5" (76mm and 89mm). The cups should be clean with no apparent fragrance and at room temperature. Lids can be of any material.

**All cups used should be of the same volume, dimensions, and material of manufacture.*

SAMPLE PREPARATION

Roasting | The sample should be roasted within 24 hours of cupping and allowed to rest for at least 8 hours. Roast profile should be a light to light-medium roast, measured via the M- Basic (Gourmet) Agtron scale of approximately 58 on whole bean and 63 on ground, +/- 1 point (55-60 on the standard scale or Agtron/SCAA Roast tile #55). The roast should be completed in no less than 8 minutes and no more than 12 minutes. Scorching or tipping should not be apparent. Sample should be immediately air-cooled (no water quenching). When they reach room temperature (approx. 75°F or 20°C), completed samples should then be stored in airtight containers or non-permeable bags until cupping to minimize exposure to air and prevent contamination. Samples should be stored in a cool dark place, but not refrigerated or frozen.

Determining Measurements | The optimum ratio is 8.25 grams of coffee per 150 mL of water, as this conforms to the mid-point of the optimum balance recipes for the Golden Cup. Determine the volume of water in the selected cupping glass and adjust weight of coffee to this ratio within +/- 0.25 grams.

Cupping Preparation | Sample should be ground immediately prior to cupping, no more than 15 minutes before infusion with water. If this is not possible, samples should be covered and infused not more than 30 minutes after grinding. Samples should be weighed out as whole beans to the predetermined ratio (see above for ratio) for the appropriate cup fluid volume. Five (5) cups from each sample should be prepared to evaluate sample uniformity. Each cup of sample should be ground by running a cleansing quantity of the sample through the grinder, and then grinding each cup's batch individually into the cupping glasses, ensuring that the whole and consistent quantity of sample gets deposited into each cup. A lid should be placed on each cup immediately after grinding.

Pouring | Water used for cupping should be clean and odor free, but not distilled or softened. Ideal Total Dissolve Solids are 125-175 ppm, but should not be less than 100 ppm or more than 250 ppm. The water should be freshly drawn and brought to approximately 200° F (93°C) at the time it is poured onto the ground coffee (temperature needs to be adjusted to elevation). The hot water should be poured directly onto the measured grounds to the rim of the cup, making sure to wet all of the grounds. The grounds should be allowed to steep undisturbed for a period of 3-5 minutes before evaluation.

Samples should first be visually inspected for roast color. This is marked on the sheet and may be used as a reference during the rating of specific flavor attributes. The sequence of rating each attribute is based on the flavor perception changes caused by decreasing temperature of the coffee as it cools:

Step #1 – Fragrance/Aroma

• Within 15 minutes after samples have been ground, the dry fragrance of the samplesshould be evaluated by lifting the lid and sniffing the dry grounds.

• After infusing with water, the crust is left unbroken for at least 3 minutes but not more than 5 minutes. Breaking of the crust is done by stirring 3 times, then allowing the foam to run down the back of the spoon while gently sniffing. The Fragrance/Aroma score is then marked on the basis of dry and wet evaluation.

Step #2 – Flavor, Aftertaste, Acidity, Body, and Balance

• When the sample has cooled to 160° F (71° C), in about 8-10 minutes from infusion, evaluation of the liquor should begin. The liquor is aspirated into the mouth in such a way as to cover as much area as possible, especially the tongue and upper palate. Because the retro nasal vapors are at their maximum intensity at these elevated temperatures, Flavor and Aftertaste are rated at this point.

• As the coffee continues to cool (160° F - 140° F), the Acidity, Body and Balance are rated next. Balance is the cupper's assessment of how well the Flavor, Aftertaste, Acidity, and Body fit together in a synergistic combination.

• The cupper's preference for the different attributes is evaluated at several different temperatures (2 or 3 times) as the sample cools. To rate the sample on the 16-point scale, circle the appropriate tick-mark on the cupping form. If a change is made (if a sample gains or loses some of its perceived quality due to temperature changes), re-mark the horizontal scale and draw an arrow to indicate the direction of the final score.

Step #3 – Sweetness, Uniformity, and Cleanliness

• As the brew approaches room temperature (below 100°F) Sweetness, Uniformity, and Clean Cup are evaluated. For these attributes, the cupper makes a judgment on each individual cup, awarding 2 points per cup per attribute (10 points maximum score).

• Evaluation of the liquor should cease when the sample reaches 70° F (21° C) and the Overall score is determined by the cupper and given to the sample as "Cupper's Points" based on ALL of the combined attributes.

Step #4 - Scoring

• After evaluating the samples, all the scores are added as describe in the "Scoring" section below and the Final Score is written in the upper right hand box.

INDIVIDUAL COMPONENT SCORES

The attribute score is recorded in the appropriate box on the cupping form. On some of the positive attributes, there are two tick-mark scales.

• The vertical (up and down) scales are used to rank the intensity of the listed sensory component and are marked for the evaluator's record.

• The horizontal (left to right) scales are used to rate the panelist's perception of relative quality of the particular component based upon their perception of the sample and experiential understanding of quality.

Each of these attributes is described more fully as follows:

• *Fragrance/Aroma* | The aromatic aspects include Fragrance (defined as the smell of the ground coffee when still dry) and Aroma (the smell of the coffee when infused with hot water). One can evaluate this at three distinct steps in the cupping process: (1) sniffing the grounds placed into the cup before pouring water onto the coffee; (2) sniffing the aromas released while breaking the crust; and (3) sniffing the aromas released as the coffee steeps. Specific aromas can be noted under "qualities" and the intensity of the dry, break, and wet aroma aspects noted on the 5-point vertical scales. The score finally given should reflect the preference of all three aspects of a sample's Fragrance/Aroma.

• *Flavor* | Flavor represents the coffee's principal character, the "mid-range" notes, in between the first impressions given by the coffee's first aroma and acidity to its final aftertaste. It is a combined

impression of all the gustatory (taste bud) sensations and retro-nasal aromas that go from the mouth to nose. The score given for Flavor should account for the intensity, quality and complexity of its combined taste and aroma, experienced when the coffee is slurped into the mouth vigorously so as to involve the entire palate in the evaluation.

• *Aftertaste* | Aftertaste is defined as the length of positive flavor (taste and aroma) qualities emanating from the back of the palate and remaining after the coffee is expectorated or swallowed. If the aftertaste were short or unpleasant, a lower score would be given.

• *Acidity* | Acidity is often described as "brightness" when favorable or "sour" when unfavorable. At its best, acidity contributes to a coffee's liveliness, sweetness, and fresh- fruit character and is almost immediately experienced and evaluated when the coffee is first slurped into the mouth. Acidity that is overly intense or dominating may be unpleasant, however, and excessive acidity may not be appropriate to the flavor profile of the sample. The final score marked on the horizontal tick-mark scale should reflect the panelist's perceived quality for the Acidity relative to the expected flavor profile based on origin characteristics and/or other factors (degree of roast, intended use, etc.). Coffees expected to be high in Acidity, such as a Kenya coffee, or coffees expected to be low in Acidity, such as a Sumatra coffee, can receive equally high preference scores although their intensity rankings will be quite different.

• *Body* | The quality of Body is based upon the tactile feeling of the liquid in the mouth, especially as perceived between the tongue and roof of the mouth. Most samples with heavy Body may also receive a high score in terms of quality due to the presence of brew colloids and sucrose. Some samples with lighter Body may also have a pleasant feeling in the mouth, however. Coffees expected to be high in Body, such as a Sumatra coffee, or coffees expected to be low in Body, such as a Mexican coffee, can receive equally high preference scores although their intensity rankings will be quite different.

• *Balance* | How all the various aspects of Flavor, Aftertaste, Acidity and Body of the sample work together and complement or contrast to each other is Balance. If the sample is lacking in certain aroma or taste attributes or if some attributes are overpowering, the Balance score would be reduced.

• *Sweetness* | Sweetness refers to a pleasing fullness of flavor as well as any obvious sweetness and its perception is the result of the presence of certain carbohydrates. The opposite of sweetness in this context is sour, astringency or "green" flavors. This quality may not be directly perceived as in sucrose-laden products such as soft drinks, but will affect other flavor attributes. 2 points are awarded for each cup displaying this attribute for a maximum score of 10 points.

• *Clean Cup* | Clean Cup refers to a lack of interfering negative impressions from first ingestion to final aftertaste, a "transparency" of cup. In evaluating this attribute, notice the total flavor experience from the time of the initial ingestion to final swallowing or expectoration. Any non-coffee like tastes or aromas will disqualify an individual cup. 2 points are awarded for each cup displaying the attribute of Clean Cup.

• *Uniformity* | Uniformity refers to consistency of flavor of the different cups of the sample tasted. If the cups taste different, the rating of this aspect would not be as high. 2 points are awarded for each cup displaying this attribute, with a maximum of 10 points if all 5 cups are the same.

• *Overall* | The "overall" scoring aspect is meant to reflect the holistically integrated rating of the sample as perceived by the individual panelist. A sample with many highly pleasant aspects, but not quite "measuring up" would receive a lower rating. A coffee that met expectations as to its character and reflected particular origin flavor qualities would receive a high score. An exemplary example of preferred characteristics might receive an even higher score. This is the step where the panelists make their personal appraisal.

• *Defects* | Defects are negative or poor flavors that detract from the quality of the coffee. These are classified in 2 ways. A taint is an off-flavor that is noticeable, but not overwhelming, usually found in the aromatic aspects. A "taint" is given a "2" in intensity. A fault is an off-flavor, usually found in the taste aspects, that is either overwhelming or renders the sample unpalatable and is given an intensity rating of "4". The defect must first be classified (as a taint or a fault), then described ("sour," "rubbery," "ferment," "phenolic", for example) and the description written down. The number of cups in which the defect was found is then noted, and the intensity of the defect is recorded as either a 2 or 4. The defect score is multiplied and subtracted from the total score according to directions on the cupping form.

FINAL SCORING

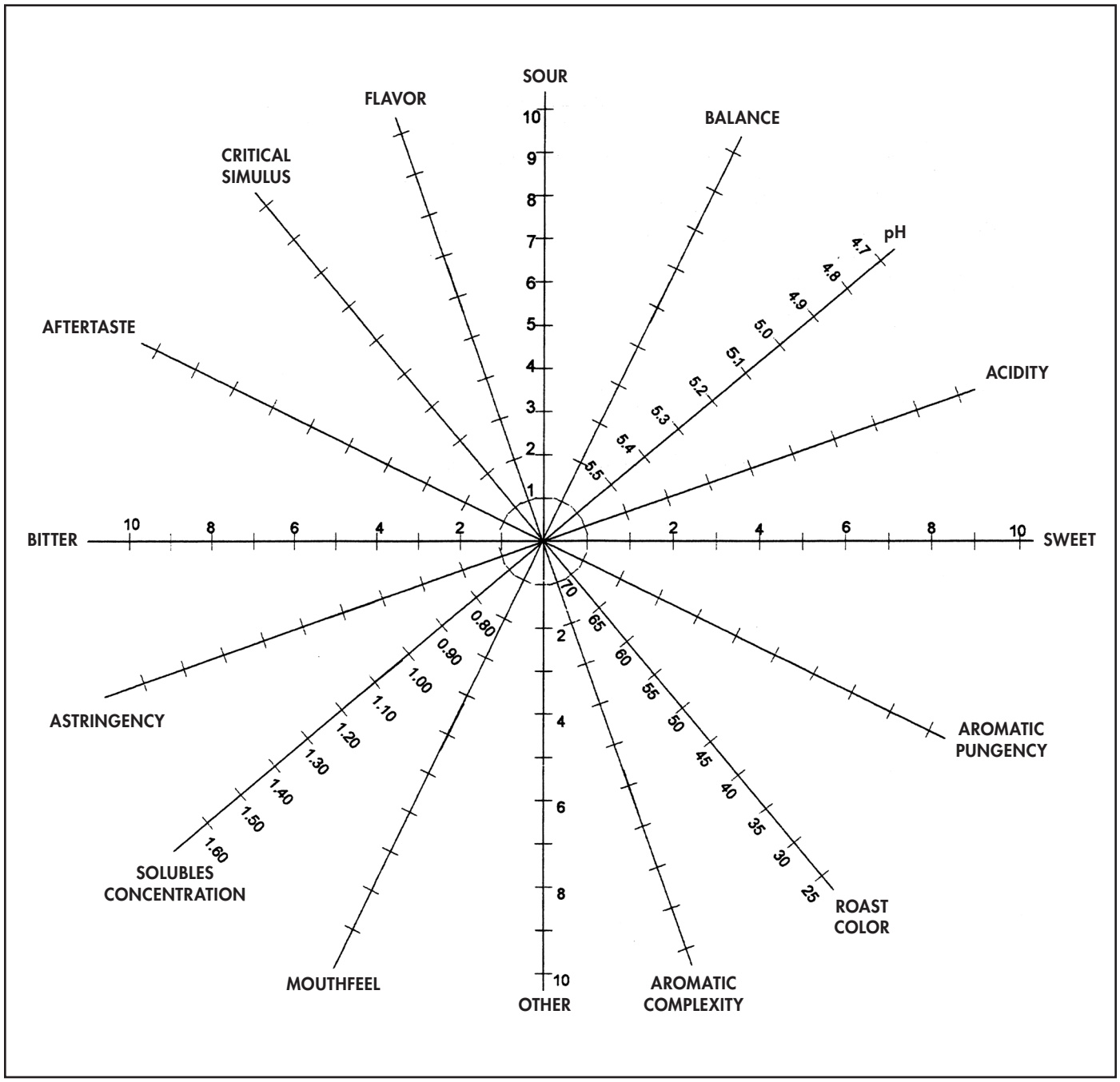
The Final Score is calculated by first summing the individual scores given for each of the primary attributes in the box marked "Total Score." Defects are then subtracted from the "Total Score" to arrive at a "Final Score." The following Scoring Key has proven to be a meaningful way to describe the range of coffee quality for the Final Score.

Total Score Quality Classification

90-100	Outstanding	Specialty
85-89.99	Excellent	
80-84.99	Very Good	
> 80.00	Below Specialty Quality	Not Specialty

DIAGRAMS

COFFEE ATTRIBUTE SCALING



Name: _____ Date: _____

Company: _____ Ref # _____

Cupping Evaluation

Grading Form – Single Sample

Name: _____ Date: _____

Company: _____ Ref # _____

Fragrance/Aroma: (aromatic complexity **– *preference rating***)

Very Poor									Outstanding
1	2	3	4	5	6	7	8	9	10

Acidity: (brightness of the coffee **– *intensity ranking***)

Very Poor									Very Bright
1	2	3	4	5	6	7	8	9	10

Flavor: (pleasing characteristics of the coffee **– *preference rating***)

Very Poor									Outstanding
1	2	3	4	5	6	7	8	9	10

Body: (mouthfeel of the beverage **– *intensity ranking***)

Very Thin									Very Heavy
1	2	3	4	5	6	7	8	9	10

Aftertaste: (pleasing sensations on the palate **– *preference rating***)

Very Poor									Outstanding
1	2	3	4	5	6	7	8	9	10

Balance: (overall pleasing characteristic of the coffee **– *preference rating***)

Very Poor										Outstanding
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5

SPECIALTY COFFEE ASSOCIATION OF AMERICA®

Specialty Coffee Association of America Coffee Cupping Form

Name: _____

Date: _____

Quality scale:			
6.00 - Good	7.00 - Very Good	8.00 - Excellent	9.00 - Outstanding
6.25	7.25	8.25	9.25
6.50	7.50	8.50	9.50
6.75	7.75	8.75	9.75

Sample # | Roast Level or Sample | Fragrance/Aroma Score: | Flavor Score: | Acidity Score: | Body Score: | Uniformity Score: | Clean Cup Score: | Overall Score: | Total Score

Dry | Qualities: | Break | Aftertaste Score: | Intensity: High / Low | Level: Heavy / Thin | Balance Score: | Sweetness Score: | Defects (subtract): Taint=2, Fault=4 | # cups X Intensity =

Notes: | Final Score

Sample # | Roast Level or Sample | Fragrance/Aroma Score: | Flavor Score: | Acidity Score: | Body Score: | Uniformity Score: | Clean Cup Score: | Overall Score: | Total Score

Dry | Qualities: | Break | Aftertaste Score: | Intensity: High / Low | Level: Heavy / Thin | Balance Score: | Sweetness Score: | Defects (subtract): Taint=2, Fault=4 | # cups X Intensity =

Notes: | Final Score

Sample # | Roast Level or Sample | Fragrance/Aroma Score: | Flavor Score: | Acidity Score: | Body Score: | Uniformity Score: | Clean Cup Score: | Overall Score: | Total Score

Dry | Qualities: | Break | Aftertaste Score: | Intensity: High / Low | Level: Heavy / Thin | Balance Score: | Sweetness Score: | Defects (subtract): Taint=2, Fault=4 | # cups X Intensity =

Notes: | Final Score

Sample # | Roast Level or Sample | Fragrance/Aroma Score: | Flavor Score: | Acidity Score: | Body Score: | Uniformity Score: | Clean Cup Score: | Overall Score: | Total Score

Dry | Qualities: | Break | Aftertaste Score: | Intensity: High / Low | Level: Heavy / Thin | Balance Score: | Sweetness Score: | Defects (subtract): Taint=2, Fault=4 | # cups X Intensity =

Notes: | Final Score

APPENDIX I – PRESCREENING QUESTIONNAIRE

CUPPING PANEL SELECTION

Prescreening Questionnaire

Name _____

Company _____

Address _____

City _____ State _____ ZIP _____

TEL _____ FAX _____ e-mail _____

1. Number of year's experience in the coffee industry? ____
2. Number of year's experience cupping coffee? ____
3. Have you ever participated in a Cupping Competition? YES ____ NO ____
4. Do you take any medications affecting your taste and smell? If yes, explain:

   _____

5. Do you smoke on a regular basis? YES ____ NO ____
6. Are you allergic to any foods? YES ____ NO ____
7. Do you have any sinus allergies? YES ____ NO ____
8. Is your ability to distinguish tastes:

   Better than Average ____ Average ____ Worse than Average ____

9. Is your ability to distinguish odors:

   Better than Average ____ Average ____ Worse than Average ____

10. Have you ever been selected for participation on a flavor panel? YES ____ NO ____

APPENDIX II – PRESCREENING FLAVOR RECOGNITION TESTS

CUPPING PANEL SELECTION

Basic Tastes Ranking/Rating/Combination Tests

1. Reference Set of Solutions:

Taste		Concentration in grams / liter I	II	III	IV
Sour	citric acid / water, g / L	0.25	0.50	1.00	2.00
Sweet	sugar / water, g / L	5.00	10.0	20.0	40.0
Salt	salt / water, g / L	0.50	1.00	2.00	4.00

Prepare solutions using water free of off-flavors (Crystal Fresh bottled drinking water is recommended). Solutions may be prepared 24-36 hours prior to use. Refrigerate prepared samples. On day of evaluation, allow to warm to 70°F (room temperature) and serve 10 milliliters per participant.

2. Ranking Tests:

a. Scope: Panelists are required to discriminate between varying concentrations of sour, sweet, and salt in the reference set of solutions.

b. Test Design: Panelists are presented coded samples, samples I through IV of one Reference Set at a time, ranking the relative intensity of each sample.

c. Scoring System:

Rank the *sour* taste solutions in the coded cups in ascending order:

CODE

Least sour _____

_____

_____

Most sour _____

Rank the *sweet* taste solutions in the coded cups in ascending order:

CODE

Least sweet _____

_____

_____

Most sweet _____

Rank the *salt* taste solutions in the coded cups in ascending order:

CODE

Least salty _____

_____

_____

Most salty _____

3. ***Identification and Ranking Tests***:

A. Scope: Assessment of coffee's flavor requires recognition of, and rating on, a numerical scale varying degrees of intensity in sourness, sweetness, and saltiness. Skill is required in assessing the correct proportionality to a particular stimulation.

B. Test Design: Panelists are presented twelve coded samples of each concentration of the Reference Set of solutions (I through IV of sour, sweet, and salt) in random order, *identifying* and *ranking* them on a numerical scale from 0-16.

C. Scoring Sytem: Rate the *sourness*, *sweetness*, and *saltiness* of each coded solution for its relative intensity/strength on the scale below:

Code	Identify	Ranking
1 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
3 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
4 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
5 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
6 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
7 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
8 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
9 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
10 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
11 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
12 -_____	_____	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

4. ***Basic Tastes Combination Tests***:

A. Scope: Coffee's flavor often includes a combination of two or three modalities, and tasting the blends of sour, sweet, and salt provide the panelists with an opportunity to develop the skills of rating taste intensities without the distraction of aromatics.

B. Test Design: Panelists begin by familiarizing themselves with the Reference Set, consisting of single component solutions. The cups carry labels such as Sweet I, Salt II, Sour III, Sweet IV, where I = 1-4, II = 5-8, III = 9-12, and IV = 13-16. The Reference Set remains available for the duration of the exercise.

The Evaluation Set consists of equal-proportion blends of two or three of the Reference solutions. The panel leader can prepare some or all of the blends in the Evaluation Set. The panel leader hands out one blend at a time, and the panelists record their impressions using a score sheet.

C. Evaluation Set:

Code	**% Sweet**	**% Sour**	**% Salt**
232	I	II	
715	I	IV	
115	II	III	
874	I		II
903	I		III
266	III		II
379		III	II
438		IV	I
541		II	III
627	II	I	II
043	II	IV	III
210	III	I	I
614	I	III	II
337	I	I	III

Prepare solutions by mixing equal quantities of the appropriate reference solutions. Solutions may be prepared 24-36 hours prior to use. Refrigerate prepared samples. On day of evaluation, allow to warm to 70°F (room temperature) and serve 10 milliliters (10ml) per participant.

D. Scoring System: Panelist rank intensity/strength of **Sweet**, **Sour**, and **Salty** on a scale of **0-16**, with 0 = imperceptible, 1 = very slight and 16 = very intense.

Code	**Sweet**	**Sour**	**Salt**
232	_____	_____	_____
715	_____	_____	_____
115	_____	_____	_____
874	_____	_____	_____
903	_____	_____	_____
266	_____	_____	_____
379	_____	_____	_____
438	_____	_____	_____
541	_____	_____	_____
627	_____	_____	_____
043	_____	_____	_____
210	_____	_____	_____
614	_____	_____	_____
337	_____	_____	_____

E. Basic Taste Combination Exercise – Average results:

Sample	**Sweet**	**Sour**	**Salty**
232	4 – 8	6 – 9	0 – 2
715	2 – 6	11 – 15	0 – 2
115	7 - 11	8 – 12	0 – 2
874	2 – 6	0 – 2	2 – 6
903	2 – 6	0 – 2	4 -8
266	8 – 12	0 – 2	4 -8
379	0 – 2	8 – 12	6 – 10
438	0 – 2	9 - 13	2 – 6
541	0 – 2	6 – 10	8 - 12
627	4 – 8	1 – 5	2 – 6
043	6 – 10	8 – 12	7 – 11
210	5 – 9	1 – 5	1 – 5
614	3 – 7	7 – 11	6 -10
337	4 - 8	1 -5	4 – 8

APPENDIX III – AROMA RECOGNITION TESTS

Coffee Fragrance Matching Tests

1. Scope: Coffee fragrance matching tests are used to determine a panelist's ability to discriminate (and describe, if asked in addition) differences among multiple stimuli at intensities well above the threshold levels found in coffee.

2. Procedure: Familiarize the panelists with an initial set of six coded, *but not identified*, coffee aromas. Then present a randomly lettered set of nine samples, of which a subset is identical to the initial set. Ask the panelist to identify on the score sheet the familiar samples in the second set and to label them with the corresponding codes.

3. Reference Sets: (Selected from Le Nez du Café by Jean Lenoir)

Aromatic Taints

1st Set	**2nd Set Match**	**Descriptor**
001	_____	_____
036	_____	_____
020	_____	_____
005	_____	_____
013	_____	_____
035	_____	_____

List of Descriptors:

Earthy	Coffee Pulp	Rubber
Leather	Basmati Rice	Cooked Beef
Straw	Medicinal	Smoke

Enzymatic Aromas

1st Set	**2nd Set Match**	**Descriptor**
012	_____	_____
015	_____	_____
011	_____	_____
017	_____	_____
002	_____	_____
019	_____	_____

List of Descriptors:

Coffee Blossom	Lemon	Garden Peas
Tea Rose	Apple	Potato
Honeyed	Apricot	Cucumber

Sugar Browning Aromas

1st Set	2nd Set Match	Descriptor
025		
026		
018		
010		
028		
030		

List of Descriptors:

Carmel	Dark Chocolate	Roasted Hazelnuts
Fresh Butter	Roasted Almonds	Vanilla
Roasted Peanuts	Walnuts	Toast

Dry Distillation

1st Set	2nd Set Match	Descriptor
008		
024		
007		
009		
006		
033		

List of Descriptors:

Pepper	Maple Syrup	Malt
Clove-like	Black Currant-like	Roasted Coffee
Coriander Seed	Cedar	Pipe Tobacco

4. Instructions: Sniff the first set of fragrances; allow time to rest after each sample. Sniff the second set of fragrances and determine which samples in the second set correspond to each sample in the first set. Write down the code of the fragrance in the second set next to its match from the first set. Determine which descriptor from the given list best describes the fragrance pair.

GLOSSARY

LIST OF CONTRIBUTORS

CBC The Coffee Brewing Center was a training activity funded by the Pan-American Coffee Bureau. The definitions were taken from the "Coffee Brewing Workshop Manual," Publication #54 revised 1970.

ICO The International Coffee Organization sponsored a Technical Unit that conducted sensory research. The definitions were taken from the "Sensory Evaluation of Coffee" published in 1991.

J. ARON J. Aron was a major coffee importing firm that produced a short handbook on coffee trading from which the definitions were taken.

LENOIR Jean Lenoir produced a coffee aroma training kit in 1997. With the kit, he published a short booklet, *Research into Aromas*, which he co-authored with David Guermonprez. The original work was written in French and was translated into English by Sharon Sutcliffe.

LINGLE Ted R. Lingle wrote the Coffee Cupper's Handbook in 1984 as part of a coffee promotion project for the Coffee Development Group. The definitions were recorded during the research for the book.

NESTLE The Nestle Beverage Company is a worldwide leader in coffee manufacturing. The definitions were taken from their handbook of coffee taste characteristics.

PANGBORN Rose Marie Pangborn is a Professor at the University of California Davis campus. The definitions were taken from her book, *Principles of Sensory Evaluation of Food*.

SIVETZ Michael Sivetz is a chemical engineer who has done extensive research in coffee processing technology. The definitions were taken from his book, *Coffee Technology*.

SMITH L. K. Smith produced a chart on coffee and tea tasting terminology. The definitions were taken from his chart.

WEBSTER Merriam Webster's Collegiate Dictionary, Tenth Edition, published by Merriam-Webster Incorporated, Springfield, Massachusetts, 1994.

TERMS & DEFINITIONS

ACERBIC

Webster

acerb — Acid or sour to the taste.

acerbity — Acidity of taste

Lingle

A taste fault in the coffee brew giving an acrid and sour sensation on the tongue. The result of long-chain organic compounds being broken into shorter-chain organic compounds due to excessive heat during the aging process after brewing.

ACID

Webster

A sour substance

-Any of various typical water soluble and sour compounds capable of reacting with a base to form a salt that are hydrogen-containing molecules or ions able to give up a proton to a base or substances able to accept an unshared pair of electrons from a base.

Lingle

Any chemical compound containing hydrogen capable of giving off protons (hydrogen ions) – refers to the acid content of a stimulus; use in place of the word *sour* is erroneous.

Nestle

A normal characteristic of Arabica coffees, particularly of high-grown varieties. Some strains are sought for this particular taste (Kenya), which is influenced by the degree of roasting and does not seem to be objectively expressed by a pH measurement.

Experts recognize three kinds of acidity:

1. natural and desirable: acid
2. natural and undesirable: sour
3. unnatural and undesirable: process acidity (developed by the technological process and perceived together with astringency-sometimes sought as a substitute for natural acidity but generally has a biting, puckery flavor).

Pangborn

Any chemical compound containing hydrogen capable of giving off protons (hydrogen ions) - refers to the acid content of a stimulus: use in place of the word *sour* is erroneous.

ACIDITY

Webster

The quality, state or degree of being acid-tartness.

Lingle

A measure of the acid content of a fluid, in which the relative strength (pH) of the acid is quantified by the number of protons (hydrogen ions) released.

Sivetz

A desirable flavor in high grown coffee - sharp and pleasing, but not biting.

ICO

A basic taste characterized by the solution of an organic acid. A desirable sharp and pleasing taste particularly strong with certain origins as opposed to an over-fermented sour taste.

ACIDY

Lingle

A primary coffee taste sensation related to the presence of sweet tasting compounds;

-Created as the acids in the coffee combine with the sugars to increase the overall sweetness of the brew.

-Found most often in washed Arabica coffees grown at elevations above 4,000 feet, such as Colombian Excelso coffee.

-Acidy coffees range in taste from 'piquant' to 'nippy' with the taste sensation experienced at the tip of the tongue.

CBC

A term used to describe a coffee in which this desirable cup characteristic occurs;

-The characteristic is particularly desirable in Brazils and is found in most milds. Colombians have both acid and body.

-An acidy flavor is sharp and pleasing to the taste as opposed to sour, sourish, or fermented taste. It denotes a taste that has sharpness, snap, and life, as compared to a sweet, heavy, mellow flavor.

-Old crop coffees are never acidy.

Ukers

A term used to describe a coffee in which this desirable cup characteristic occurs.

Smith

A sharp and pleasing characteristic particularly strong with certain origins;

-As opposed to a caustic, over-fermented, sour or bitter flavor.

ACRID

Webster

Sharp and harsh or unpleasant pungent in taste or odor;
-Bitterly irritating to the senses.

Lingle

A secondary coffee taste sensation related to soury;

-Characterized by a predominantly piercing sour sensation on the posterior sides of the tongue when the brew is first sipped, then replaced by a distant sour sensation as the brew cools;

-Caused by a higher (than normal) percentage of acids, which are sour, increasing the perception of salty taste sensation during the taste modulation of salty and sour.

-Typified by an unwashed Rio coffee from Brazil;

Sivetz

A burnt flavor – sharp, bitter, and perhaps irritating.

Pangborn

Sharp and harsh odor; pungent.

Nestle

See harsh.

AFTERTASTE

Webster

A persistence of a sensation (as of flavor) after the stimulating agent has gone.

Lingle

The sensation of brewed coffee vapors, ranging from carbony to chocolaty to spicy to turpeny, released from the residue remaining in the mouth after swallowing.

Sivetz

A taste that remains in the mouth longer than usual.

Pangborn

The experience that, under certain conditions, follows removal of the taste stimulus;

-It may be continuous with the primary experience or may follow as a different quality after a period during which swallowing, saliva, dilution, and other influences may have affected the stimulus substance.

AGED

Webster

Having acquired a desirable quality with age.

Lingle

A taste and mouthfeel taint that gives coffee beans a less acidy taste and a greater body;

-The result of enzyme activity in the green coffee beans, creating a physical change during the aging process while the coffee beans are stored after harvesting.

Sivetz

Implies a controlled coffee storage to bring out a heavy body;

-Not the same as "old" crop.

Pangborn

Refers to flavors and other sensory properties that develop in foods as a result of time and conditions of storage;

-May be desirable or undesirable.

ALKALINE

Webster

Of, relating to, or having the properties of an alkaline;

-Having pH or more than 7.0;

-Also, alkalescent.

Lingle

A secondary coffee taste sensation related to *pungent*;

-Characterized by a dry, clawing sensation at the back of the tongue;

Alkaline, cont.

-Caused by the presence of both alkaline and phenolic compounds that have bitter (not necessarily displeasing) taste sensations;

-Typical taste sensation in dark roasted coffee.

Pangborn

Taste sensation usually attributed to a combination of sourness and bitterness (and possibly tactile) stimuli.

ANIMAL-LIKE

ICO

This odor descriptor is somewhat reminiscent of the smell of animals. It is not a fragrant aroma like musk but has the characteristic odor of wet fur, sweat, leather, hides or urine. It is not necessarily considered a negative attribute but is generally used to describe strong notes.

APPLE

Webster

The fleshy, usually rounded and red, yellow or green edible pomes fruit of a tree of the rose family.

Lenoir

This is the fruity, yeasty smell of freshly-peeled apples. Apples and coffee have many common constituents: acetaldehyde, hexanal, hexanoic acid, butyl acetate and other esters with characteristic odors.

Lingle

Aromatic sensation rarely found in the fragrance of freshly roasted and ground coffee. It has a dry citrus character reminiscent of apple peels.

APRICOT

Webster

The oval orange-colored fruit of a temperate-zone resembling the related peach and plum in flavor.

Lenoir

This exquisite, concentrated and precise scent is that of the fresh fruit and of apricot preserve. Benzaldehyde, linalol, alpha-terpineol and gamma lactores are common to both the apricot and coffee.

Lingle

Aromatic sensation rarely found in the fragrance of freshly roasted and ground coffee. It has a unique fruity characteristic reminiscent of dried apricots.

AROMA

Webster

A distinctive pleasing odor;

-Any smell or odor;

A distinctive quality.

Lingle

The sensation of the gases released from brewed coffee, as they are inhaled through the nose by sniffing.

Sivetz

Usually volatile, pleasant-smelling substances with the characteristic odor of coffee;

-Chemically, they are aldehydes, ketones, esters, volatile acids, phenols, etc.

Pangborn

The fragrance or odor of food, perceived by the nose by sniffing;

-In wines, aroma refers to odors derived from the variety of grape, e.g., Muscat aroma.

AROMATIC

Webster

Of, relating to, or having aroma;

-Of, relating to, characterized by the presence of at least one benzene ring, usually composed of cyclic hydrocarbons and their derivatives.

Nestle

Designates a coffee that fully manifests the aroma characteristic of its nature and origin.

Pangborn

Possessing a fragrant, slightly pungent, aroma, usually pleasant.

ASHY

ICO

This odor descriptor is similar to that of an ashtray, the odor of smokers' fingers or the smell one gets when cleaning out a fireplace. It is not used as a negative attribute. Generally speaking, this descriptor is used by the tasters to indicate the degree of roast.

ASTRINGENT

Webster

Able to draw together the soft organic tissues, e.g., styptic lotions or puckery fruits;

-Suggestive of an astringent effect upon tissue.

Lingle

A secondary coffee taste sensation related to *sharp*;

-Characterized by a predominantly puckering, salty sensation on the anterior sides of the tongue when the brew is first sipped;

-Caused by the acids increasing the perceived saltiness during the modulation of the predominantly salty taste sensation;

-Typified by an unwashed Indonesian Robusta coffee.

Nestle

Acids have the property of causing astringency;

-In regards to coffee, astringency is identified with undesirable acidity.

Sivetz

A flavor that causes puckering and a bitter taste impression.

Pangborn

Quality perceived through the complex of sensations caused by shrinking, drawing, or puckering of the skin surfaces of the oral cavity;

-Dry feeling in the mouth.

ICO

This attribute is characteristic of an aftertaste sensation consistent with a dry feeling in the mouth, undesirable in coffee.

BAGGY

Webster

Loose, puffed out, or hanging like a bag.

Nestle

Off-taste often observed in cups of weakly roasted coffees that have been stored for a long time in unsuitable conditions;

-A property unlikely to develop as a result of technology.

BAKED

Lingle

A taste and odor taint that gives the coffee brew an insipid taste and a flat bouquet;

-The result of the roasting process proceeding with too little heat over too long a period, causing the caramelization process to follow chemical pathways that do not develop flavorful compounds.

CBC

Underdevelopment of the bean during roasting due to insufficient rate of heat input.

BAKEY

Nestle

Generally unpleasant characteristic of having an over-baked taste in an over-heated coffee;

-Ranks in the following order of intensity: cooked-bakey-burnt.

Pangborn

In tea, an unpleasant taste in the brew, usually caused by too high temperatures during the firing of the leaves and/or the driving off of too much moisture.

BALANCED

Webster

Equipoise between two contrasting or opposing elements;

-An aesthetically pleasing integration of elements.

Lingle

A taster term applied to the liquoring properties of the coffee brew denoting a pleasing combination of two or more primary taste sensations.

Nestle

A (well) balanced coffee must contain all the basic characteristics to the right extent;

-Synonym: *round*.

BASMATI RICE

Webster

A cultivated, aromatic long-grain rice of South Asian origin.

Lenoir

This is the characteristic smell of cooked scented rice such as Basmati, a variety from South-East Asia where it is also called "popcorn rice." This smell is indeed reminiscent of that of puffed grains of corn that burst when heated, and it is represented by acetyl-2-pyroline. This is the odor experienced at the beginning of roasting.

Lingle

An aromatic sensation created at the beginning of the sugar browning process when malt or other cereal grains are heated. It is most easily recognized at the beginning of the roasting process when the dominant aroma is more reminiscent of the smell of popcorn rather than peanuts.

BASIC TASTES

Lingle

Basic tastes – sweet, sour, salt, and bitter; Characterized respectively by:

Sucrose - sweet

Tartaric acid - sour

Sodium chloride - salt

Quinine - bitter

Pangborn

Sweet, sour, salty, and bitter sensations, which may respectively be characterized by sucrose, tartaric acid, sodium chloride and quinine.

BEANY

Nestle

Specific aroma of insufficiently roasted coffee that has not been able to develop its full aroma.

-Synonym: *green*.

BITTER

Webster

Having or being a peculiarly acrid, astringent, or disagreeable taste suggestive of an infusion of hops;

-That is one of the four basic taste sensations.

Lingle

A basic taste characterized by solutions of quinine, caffeine, and certain other alkaloids;

-Perceived primarily by *circumvallate papillae* at the back of the tongue.

Nestle

Generally normal characteristics of coffees connected with their chemical constitution;

-Influenced by degree of roasting and method of preparing the drink;

-Canephora are more bitter than Arabica coffees;

-A desired characteristic at a certain level.

Bitter, cont.

Pangborn

One of the basic tastes characterized by solutions of caffeine, quinine, and certain alkaloids;

-Perceived primarily by the *circumvallate papillae* at the back of the tongue.

Sivetz

When strong-an unpleasant, sharp taste;

-Biting, like quinine;

-Some people get an acid taste impression, while others notice a bitter taste from the same coffee.

Smith

Usually caused by over-roasting.

ICO

A primary taste characterized by the solution of caffeine, quinine and certain alkaloids. This taste is considered desirable up to a certain level and is affected by the degree of roast and brewing procedures.

BLACK CURRANT STEM

Lenoir

This is the marvelous and rather unfamiliar smell of the black currant bush with its strongly scented foliage. The scent of black currant stem in coffee is generated by mercapto-3-methylbutyl-3-formate.

Lingle

An aromatic sensation created by the dry distillation of the bean fibers during roasting. This scent has a resinous characteristic with a unique turpeny quality reminiscent of the leaves and branches of the black currant bush.

BLAND

Webster

Characterized by smoothness or tranquility;

-Dull, insipid.

Lingle

A primary coffee taste sensation related to the presence of salty tasting compounds;

-Created as the sugars in the coffee combine with the salts to reduce the overall saltiness of the brew;

-Found most often in washed Arabica coffees grown at elevations below 2,000 feet, such as a washed Arabica coffee from El Salvador (low grown central);

-Bland coffees range in taste from 'soft' to 'neutral' with the taste sensation experienced on the sides of the tongue.

Nestle

Having no distinctive taste or odor property.

Sivetz

Smooth and flavorless, such as alkaline water.

BODY

Webster

Viscosity, consistency – used especially of oils and greases;

-Richness of flavor – used of a beverage.

Lingle

The physical properties of the beverage resulting in the tactile sensations perceived on the skin or tissue in the mouth during and after ingestion.

Nestle

Used to describe the mouthfeel of a drink, corresponding to a certain consistency;

-This character is sought in coffee.

Pangborn

The quality of a food or beverage relating variously to its consistency, compactness or texture, fullness, or richness.

Sivetz

Taste sensation or oral feeling of viscosity;

-Usually associated with heavy, aged coffee flavor, but in no way an increase in true viscosity.

Smith

A strong full pleasant characteristic as opposed to being thin, not necessarily with acid.

ICO

This attribute is used to describe the physical properties of the beverage. A strong but pleasant full mouthfeel characteristic as opposed to being thin.

BOUQUET

Webster

A subtle aroma or quality;

-Distinctive fragrance of a wine.

Lingle

The total aromatic profile of a coffee brew;

-Created by the sensations of gases and vapors on the olfactory membranes;

-Which are the results of the volatile organic compounds present in the fragrance, aroma, nose and aftertaste of the brew.

Pangborn

The distinctive odor of a perfume, wine, beer or distilled spirit.

BREW

Webster

A beverage prepared for steeping, boiling, and fermentation;

-Or, a beverage prepared by infusion and fermentation.

Lingle

The complex mixture of gases, soluble material, and insoluable material extracted from roasted and ground coffee beans by submersion in water.

Nestle

(Fresh) specific taste of a good home brew properly prepared.

BRACKISH

Webster

Somewhat salty;

-Distasteful

Lingle

A taste fault giving the coffee brew a salty and alkaline sensation;

-The result of salts and alkaline inorganic material concentrating after the evaporation of water from the brew, due to excessive heat applied after brewing.

Pangborn

Salty, alkaline taste, such as that of water from a saline soil.

Sivetz

Distasteful, bitter, salty, that occurs in some water.

BRINY

Webster

Of, or resembling, brine or the sea;

-Salty

Lingle

A taste fault giving the brew a salty sensation;

-The result of the concentration of salt-like inorganic material remaining after the evaporation of water from the brew due to excessive heat applied after brewing;

-Combined with an increase in sourness resulting from increased acidity due to the break-up of organic molecules into shorter carbon chain compounds.

BURNT

Nestle

(Taste) applies to a coffee that has been over-roasted;

-*Cooked*

Pangborn

A smoky or tarry odor or flavor; empyreumatic.

Sivetz

Burnt carbohydrate, protein and oil;

-e.g., charcoal, meat, and fatty acids.

Smith

Fiery – A bitter charcoal taste generally due to over roasting.

ICO

Burnt/smoky – This odor and flavor descriptor is similar to that found in burnt food. The odor is associated with smoke produced when burning wood. This descriptor is frequently used to indicate the degree of roast commonly found by tasters in dark-roasted or over-roasted coffees.

BUTTERY

Webster

Having the qualities, consistency, or appearance of butter.

Lenoir

Fresh butter – The characteristic of this mild, creamy smell differs according to its place of origin, and is enriched by the predominant notes of the milk from which it is made. Fresh butter and fresh hazelnuts have certain similarities. Butanedione contributes largely to butter's characteristic aroma. This molecule is also found in coffee.

Lingle

A mouthfeel term indicating a relatively high level of oily material suspended in the coffee brew;

-The result of substantial amounts of fats present in the green beans;

-Most often a characteristic of espresso-style beverages.

CARAMELIZED

Webster

To turn into caramel.

Lingle

If sugar is heated above its melting point, water is liberated and the mass turns brown and forms what is known as caramel.

-This heat degradation and polymerization of carbon compounds is a stage-wise process depending on the degree of heat applied.

-It results ultimately in the condensation of three molecules of sucrose and the loss of eight molecules of water.

Nestle

Corresponds to the taste acquired by roasted beans that have been dipped in sugar, dextrin syrup, or molasses prior to roasting;

-Also perceived in spray-dried instant coffees.

Pangborn

Color and flavor produced when sugars are heated or treated with acid;

-The effect is distinct from the Maillard reaction between sugar and proteins, which develops on storage.

Sivetz

Burn-like flavor, like a caramelized sugar;

-A desirable taste note if complemented with coffee flavor;

-Loss of coffee-flavored volatiles enhances the caramelized flavor.

CARAMELLY

Webster

Of, or related to caramel.

Lenoir

This wonderful smell evokes that of caramel, coffee, grilled pineapple, and strawberries, which is not surprising because all four of these contain furaneol. This scent is a powerful flavor enhancer and an important part of the aroma of coffee, as one of the most striking features.

Lingle

An aromatic sensation commonly found in the nose of the coffee brew;

Caramelly, cont.

-Created by a moderately volatile set of sugar carbonyl compounds found in the vapors released as the coffee is swallowed;

-Reminiscent of sensations from candies or syrups.

ICO

This aroma descriptor is reminiscent of the odor and flavor produced when caramelizing sugar without burning it. Tasters should be cautioned not to use this attribute to describe a burning note.

CARBONY

Webster

Carbonaceous – Rich in carbon.

Lingle

An aromatic sensation commonly found in the after-taste of dark roast brews;

-Created by a slightly volatile set of heterocyclic compounds found in the vapors released after the coffee brew is swallowed;

-Reminiscent to either phenolic sensations similar to the creosol-like substance or pyridine sensations similar to a burnt substance.

CAUSTIC

Webster

Capable of destroying or eating away by chemical action;

-Corrosive

-Sharp, incisive.

Lingle

Secondary coffee taste sensation related to *harsh*;

-Characterized by a burning, sour sensation on the posterior sides of the tongue when the brew is first sipped, replaced by a highly displeased sour sensation as the brew cools;

-Caused by bitter replacing sweet in the basic taste modulation, due to the loss or lack of sugars in green coffee beans;

-Typified by an unwashed Liberica coffee.

CEDAR

Webster

Any of a genus of usually tall coniferous trees of the pine family noted for their fragrant durable wood.

Lenoir

This lovely, fresh, countrified aroma is that of untreated wood and is almost identical to that of pencil shavings. It is typified by the natural essential oil of the Atlas cedar. It is more pronounced in mature harvests.

Lingle

An aromatic sensation created by the dry distillation of bean fibers during roasting. This particular scent has a warming, spicy character reminiscent of cured cedar used for clothing storage cabinets.

CHEMICAL

Webster

Acting, operated or produced by chemicals.

Lingle

See *medicinal*.

J. Aron

A definite chemical flavor (such as formaldehyde/ insecticide);

-Not to be confused with Rio flavor

ICO

Chemical/medicinal – This odor descriptor is reminiscent of chemicals, medicines and the smell of hospitals. This term is used to describe coffees having aromas such as Rio flavor, chemical residues or highly aromatic coffees which produce large amounts of volatiles.

CHICORY

Webster

The dried, ground, roasted root of chicory used to flavor or adulterate coffee.

Lingle

Taste and aroma sensations of the dried, ground, roasted chicory root;

-Combination of sweet sensations reminiscent of raisins of dried figs and medicinal sensations similar to eucalyptus derivatives;

-Overall flavor sensations vary with grades-the lower grades tending to be quite bitter.

Nestle

A complex bitter-acid and sweetish taste characteristic of the root of this plant.

Ukers

Cichorium intybus, a perennial plant, growing to a height of about three feet;

-The raw root of the plant is cut into slices, kiln dried, and then roasted in the same manner as coffee;

-It is used as an addition or filler in coffee.

CHOCOLATY

Webster

Chocolate – Of or relating to, products made from ground roasted cacao beans.

Lenoir

Dark chocolate – This is the smell of chocolate that comes from fermented, roasted, ground cocoa beans mixed with sugar (cocoa is not as rich because part of its fat is extracted by pressing). Many of the same compounds are found in both coffee and cocoa, like thiazoles and dimethylprazine, which contribute largely to their aromas.

Lingle

An aromatic sensation commonly found in the after-taste of the coffee brew;

-Created by a moderately volatile set of pyrazine compounds found in the vapors released after the coffee brew is swallowed;

-Reminiscent of either unsweetened chocolate or vanilla.

ICO

Chocolate-like – This aroma descriptor is reminiscent of the aroma and flavor of cocoa powder and chocolate (including dark chocolate and milk chocolate). It is an aroma that is sometimes referred to as sweet.

CLEAN

Webster

Free from dirt and pollution;

-Free from contamination or disease.

Lingle

Free from flavor taints and faults.

Nestle

Without any off-flavor

COARSE

Webster

Harsh, raucous, or rough in character.

Lingle

See *rough*.

J. Aron

A coffee that is rough on the tongue.

Pangborn

Used to denote a harsh, unpleasant flavor in wines.

Smith

A raspy harsh flavor, lacking in finesse.

CLOVE

Webster

The dried flower bud of a tropical tree of the myrtle family that is used as a spice and is the source of an oil.

Lenoir

This deliciously complex smell is reminiscent of cloves, sweet-william, the medicine cabinet, vanilla, and smoked products. It is characteristic of the smell of ethyl-4-guaiacol and is very potent in coffee. It is prized and appreciated for its delicate, spicy complexity that gives depth to coffee.

Lingle

An aromatic sensation created by the dry distillation of the bean fibers. This aroma complex has a spicy, pungent characteristic reminiscent of clove buds.

COFFEE BLOSSOM

Lenoir

This is the sweet perfume of the lovely white flowers of the coffee tree that used to be called Arabian jasmine in the 17th century because the two plants are so similar. The essential oil of Jasminum grandiflorum, fruitier and more highly perfumed than that of Sambac jasmine, is what gives us this cheerful note in coffee.

Lingle

An aromatic scent found in the fragrance of freshly roasted and ground coffee. It has a distinctive sweetness characteristic of jasmine.

COFFEE PULP

Lenoir

This is the smell that emanates when coffee cherries are separated from the pulp. The pulp from the cherries is broken down by fermentation: the beans macerate, ferment and release volatile acids that give this characteristic smell that could be called winey. Methyl-2 and Methyl-3 butyric acids in coffee accounts for this smell.

Lingle

An aromatic sensation found both in green and roasted coffee suggesting an over-fermentation in the processing. It has a fruity character with a slightly sour overtone.

COMMON

Webster

Falling below ordinary standards;

-Second rate.

Nestle

Coffee of ordinary and average quality.

-Comes near to poor.

COOKED

Webster

Subjected to the action of a heating process.

Nestle

Typical taste of an instant coffee treated at too high a temperature.

CORIANDER SEED

Webster

The ripened dried fruit of coriander used as a flavoring.

Lenoir

This is the smell of dried coriander seeds, made up of floral tones found in Muscat grapes and rosewood. This note is brought by linalol, which is prominent in coriander seeds and noticeable in coffee, too.

Lingle

An aromatic sensation found in the fragrance of freshly ground coffee, often with a floral characteristic.

CREAMY

Webster

Something the consistency of cream;

-Emulsified

Lingle

Coffee mouthfeel sensation caused by a moderately high level of oily material suspended in the coffee beverage;

Creamy, cont.

-The result of pronounced amounts of fats present in the green coffee beans.

Pangborn

Textural property of liquids and soft semi-solids resembling the smooth, oily consistency of an emulsion of fat or cream;

-Creamy flavors refer to apparent fat content, or richness.

CREOSOTY

Webster

Creosote – A clear or yellowish oily mixture of pheolic compounds obtained by the distillation of wood tar, especially from beechwood;

-A brownish oily liquid consisting chiefly of an a aromatic hydrocarbon obtained by distillation of coal tar and used especially as a wood preservative.

Lingle

A secondary coffee taste sensation related to *pungent*;

-Characterized by a bitter, predominately scratching sensation at the back of the tongue when the brew is first sipped, then followed by strong after-taste sensations as the brew is swallowed;

-Caused by a mixture of burnt sensations from pyridine compounds and oil-like sensations from phenolic compounds created by the dry distillation of the bean fibers at elevated roasting temperatures;

-Typical taste sensation in dark roast coffees.

CUCUMBER

Webster

The fruit of a vine of the gourd family cultivated as a garden vegetable.

Lenoir

This is the smell of firm, crunchy cucumbers. Trans-2-Nonenal gives this fresh, high quality aroma. Although it does not dominate, it is highly characteristic. Lively and fresh, it is nevertheless present in harvests which have aged a little as a premise for more woody tones.

Lingle

An aromatic sensation having a herbal, leguminous characteristic reminiscent of fresh cucumbers.

DECAFFEINATED TASTES

Lingle

Taste sensation resulting from the process used in decaffeinate coffee;

Result of three different factors:

1. The absence of caffeine, which normally acts as a catalyst during the pyrolysis phase of roasting, causes the caramelization process to take different chemical pathways, creating different (than normal) tasting compounds;
2. Flavor compounds, in addition to caffeine, are removed during the processing and not replaced, leading to the absence of taste sensations normally present in regular (non-decaffeinated) coffee;
3. Trace amounts of decaffeination solvent remain in the coffee beans, combining with natural occurring chemical compounds during the roasting process to form taste sensations unique to decaffeinated coffees.

Nestle

Special process taste, often found in decaffeinated coffees;

-Either due to something lacking, or to additional flavors.

DELICATE

Webster

Pleasing to the sense of taste or smell, especially in the mild or subtle way.

Lingle

A secondary coffee taste sensation related to *mellow*.

-Characterized by a fragile sweet-subtle sensation just past the tip of the tongue when the brew is first sipped, then replaced by the sweet sensation as the brew cools;

-Caused by the lowest possible combination of sugars and salts that still produce a sweet cast to taste;

-A modulation easily broken up by other taste sensations;

-Typified by a washed New Guinea Arabica coffee.

DIRTY

Webster

See *earthy*;

-Emphasizes the fact of the presence of dirt.

Lingle

See *earthy*;

Sivetz

Undesirable *fuzzy* taste that dominates the coffee flavor background;

-aka *foreign*.

J. Aron

Literally, a dirty flavor: Not earthy or musty

DULL

Webster

Loss of original or usual quickness, zest, or pungency.

Lingle

See *natural*.

Nestle

A coffee is dull if it gives an impression or roundness but at the same time lacks character;

-Dull comes close to the meaning of flat.

EARTHY

Webster

Consisting of, or resembling, earth (as in flavor).

Lenoir

This is the characteristic of freshly dug earth, of the

soil after a storm, and is not unlike that of beet root. Geosmin contributes to this note that is omnipresent in the atmosphere. This is a major aromatic feature in coffee associated with the dry method of processing when the cherries absorb geosmin in the soil on which they are spread to dry.

Lingle

An odor taint in the coffee beans that produces a dirt-like after-taste sensation;

-Results when fats in the green coffee beans absorb organic material from the ground during the drying process during harvesting;

-Also referred to as dirty and/or groundy.

Nestle

The undesirable odor and taste of freshly turned soil that is found in low grade batches;

-Due to poor preparation conditions and botanical origins of the green coffee;

-Reminiscent of potato flavor found in instant coffees.

Sivetz

Undesirable taste or odor resembling the odor of freshly uncovered earth.

-usually due to molds.

Pangborn

Having the odor of earth or soil.

Smith

A groundy, wet earth flavor after storage with damaged coffees.

ICO

The characteristic odor of fresh earth, wet soil or humus. Sometimes associated with molds and reminiscent of raw potato flavor, considered as an undesirable flavor when perceived in coffee.

FERMENTED

Webster

Transformed chemically by action of organic substances.

Lingle

Taste fault in the coffee beans producing a highly displeasing sour sensation on the tongue;

-The result of enzyme activity in the green coffee beans, changing the sugars to acids in the washing process during harvesting.

J. Aron

Taste of the smell of fermenting (rotting) coffee cherries or of the pulp/skin removed during the wet processing.

Sivetz

Chemical changes caused by yeast or enzymes on the green sugars or proteins;

-Like sugars fermenting aldehydes to alcohol or vinegar and proteins to amino acids;

-A pronounced fermented flavor is undesirable.

FINE CUP

J. Aron

Coffee with good, positive characteristics.

Smith

A coffee with distinct quality characteristics such as acid, body, etc.

FLAT

Webster

Lacking flavor; insipid.

Lingle

Quantitative description of coffee's bouquet;

-Denoting the presence of a limited set of gases and vapors in the fragrance, aroma, nose and after-taste of the coffee being evaluated;

-Indicates the vapors and gases are present in only a slightly perceptible intensity;

-The result of aromatic compounds leaving the beans as part of the staling process after roasting, or leaving the brew as part of the holding process after brewing;

-An odor taint.

Nestle

Anegative comment indicating a lack of character in taste and consistency.

Pangborn

Having little or not flavor;

-Loss of carbonation.

Smith

A lifeless coffee lacking in any acidity.

FLAVORY

Webster

Flavorful – Full of flavor; savory.

J. Aron

Good, positive, genuine coffee flavor.

FOREIGN TASTE

Webster

Foreign – Occurring in an abnormal situation and commonly introduced from without.

Lingle

Taste fault caused by external combination of the green coffee beans or coffee brew;

-Usually characterized by an unpleasant chemical taste sensation, such as chlorine, or by an unpleasant metallic sensation, such as iron contamination of water.

Nestle

A term that generally covers a number of imperfect flavors coming from contamination;

-For example, rubbery or moldy, etc.

Foreign Taste, cont.

Sivetz

Foreign – Undesirable fuzzy taste that dominates the coffee flavor background;

-aka *dirty*

Pangborn

Foreign flavor – Containing a flavor not normally associated with the product.

FOUL

Webster

-Being odorous and impure.

J. Aron

A rank, strong, fermented flavor;

-Or any other strong, unpleasant defective flavor, such as *hidy* or *oniony*.

FRAGRANCE

Webster

The quality or state of having a sweet or delicate odor;

-Fragrance suggests the odors of flowers or other growing things.

Lingle

The sensation of the gases released from roasted and ground coffee beans, as the aromatic compounds are inhaled through the nose by sniffing;

-Ranges from sweetly floral to sweetly spicy.

FRESH

Webster

Having its original qualities unimpaired;

-Not stale, sour, or decayed.

Lingle

An aromatic highlight in the coffee bean or coffee brew that is highly pleasing;

-The result of extremely volatile organic compounds, particularly those containing sulfur, evoking a strong sensation on the olfactory membranes.

Nestle

Positive organoleptic characteristic applying to a freshly harvested and roasted coffee whose flavor is particularly vivid.

FRUITY

Webster

Relating to, or resembling, a fruit.

Lingle

An aromatic sensation commonly found in the cup aroma of the coffee brew;

-Created by a highly volatile set of aldehydes and esters that become gases at the elevated temperatures of coffee brewing;

-Noted as either a sweet sensation reminiscent of citrus fruit or a dry sensation reminiscent of berry fruit.

Pangborn

Fruity flavor – An aromatic or fruitlike flavor.

Smith

A strong over-ripe characteristic prevalent in coffee left too long in the cherry.

ICO

Fruity / citrus – This aroma is reminiscent of the odor and taste of fruit. The natural aroma of berries is highly associated with this attribute. The perception of high acidity in some coffees is correlated with the citrus characteristic. Tasters should be cautioned not to use this attribute to describe the aroma of unripe or overripe fruit.

FULL

Webster

Containing as much, as many as is possible, or normal;

-Having all the distinguishing characteristics;

-Possessing or containing an abundance.

Lingle

Quantitative description of coffee's bouquet;

-Denoting the presence of a complete set of gasses and vapors present in the fragrance, aroma, nose, and after-taste of the coffee being evaluated;

-Indicates the gasses and vapors present in the moderately pronounced intensity.

Nestle

Indicates a full and balanced taste.

Smith

A prefix to good characteristics such as acid and body, to indicate a strong character.

GARDEN PEAS

Webster

A variable annual leguminous Eurasian vine that is locally cultivated for its rounded smooth edible protein-rich seeds.

Lenoir

This is the smell of freshly shelled, young garden peas and of their attractive green open pods. Methoxy-2-isopropyl-3-pyrazine gives this vegetal, damp earth scent, present in garden peas and green coffee beans. It is always found in green or lightly roasted coffee, but the longer the beans are roasted, the weaker it becomes.

Lingle

An aromatic sensation common to green and lightly roasted coffees having a herbal, leguminous characteristic reminiscent of garden peas.

GOOD CUP QUALITY

J. Aron

Coffee with good, positive all-around characteristics.

GRADY

J. Aron

A background flavor of dirtiness but not qualifying as dirty;

-Mostly used in the U.S.A.

GRASSY

Webster

Consisting of, or having, the flavor or odor of grass.

Lingle

Both an odor and taste taint giving the coffee beans a distinct herbal character similar to the odor of freshly mown alfalfa combined with the astringent taste of green grass;

-Created by the prominence of nitrogen containing compounds in the green beans while the cherries are maturing

Nestle

Typical taste of unripe beans and of certain freshly harvested coffee batches, corresponding to the beginning of the harvest.

Sivetz

A flavor often found in early pickings of new crop coffees and caused by immature beans;

-Suggestive of an intense, fresh greenness, such as newly mown hay or lush grass.

Pangborn

A flavor defect suggesting the bitterness or astringency of green grass.

Smith

A greenish grassy, or greenish flavor particularly strong with early crop Arabicas which have been picked prematurely.

ICO

Grassy/green/herbal — This aroma descriptor includes three terms which are associated with odors reminiscent of freshly mowed lawn, fresh green grass or herbs, green foliage, green beans or unripe fruit.

GREEN

Webster

Not fully processed or treated.

Lingle

A taste taint giving the coffee brew an herbal character due to an incomplete development of the sugar carbon compounds during the roasting process.

-Results from insufficient heat applied during too short a period.

Sivetz

Under-roasted bean, failing to develop the fullest coffee flavors;

-Somewhat pasty. A sourish flavor imparted by *green* beans, immature;

-Distinguish from *grassiness*.

J. Aron

A taste that would be associated with that of a raw vegetable leaf, often found in early new-crop coffees;

-aka *greenish* when the taste is less pronounced.

ICO

Grass/green herbal — This aroma descriptor includes three terms which are associated with odors reminiscent of freshly mowed lawn, fresh green grass or herbs, green foliage, green beans or unripe fruit.

GROUNDY

Lingle

See *earthy*.

Nestle

An earthy taste;

-It differs from mustiness.

Ukers

An earth taste sometimes found in damaged coffees.

HARD

Webster

Having a harsh or acid taste.

Lingle

A secondary coffee taste sensation related to *soury*;

-Characterized by a predominately stinging, sour sensation on the posterior sides of the tongue when the brew is first sipped, then replaced by a dominant sour sensation as the brew cools;

-Caused by a higher (than normal) percentage of sour acids combining with a lower (than normal) percentage of either sugars or salts to modulate (dampen) the sour taste sensation;

-Typified by an unwashed Minas coffee from Brazil.

Nestle

Coffee that strikes the palate by a mixed sensation;

Bitterness or astringency are not enveloped by roundness of body;

-A hard coffee is poorly balanced; at extreme end it can be acrid;

Term is used for Brazil coffee as an antonym of soft, indicating the quality of the coffee ranking as a matter of degree from: strictly soft, softish, softish/hardish, hardish, hard, Rioy.

J. Aron

With particular reference to Brazils;

-A distinct harsh taste, sometimes called *bricky* which borders on Rioy, but is free from Rioy flavor;

-Sometimes called edgy.

HARSH

Webster

Primary coffee taste sensation related to the presence of bitter tasting compounds.

Lingle

-Created as the acids combine with the bitter tasting

Harsh, cont.

compounds to increase the overall bitterness of the brew;

-Found most often in coffee species not suitable for commercial purposes, such as Liberica or Excelsa.

-Harsh coffees range in taste from *caustic* to *medicinal* with the taste sensation experienced at the back of the tongue.

Nestle

Sensation at the same time bitter and astringent, raspy and disagreeable;

-Particularly found in some poor quality Robusta coffees, often due to imperfect beans.

CBC

A term used to describe a certain coffee flavor.

Sivetz

Unpleasantly sharp, rough or irritating e.g., Parana, Brazil coffees.

Pangborn

Lacking harmony or smoothness; rasping, coarse, rough grating, discordant, astringent.

Ukers

A term used to describe a certain coffee flavor;

-Rio and similarly flavored coffees are generally described as *harsh*.

Smith

A hard, raspy, often caustic flavor sometimes described as *Rioy*.

HAZELNUT

Webster

The nut of any of a genus of shrubs or small trees of the birch family bearing nuts enclosed in leafy involucres.

Lenoir

Roasted hazelnuts — This uncommonly subtle scent is the mellow, buttery aroma of roasted hazelnuts that is so appealing and delicate. Certain ketones, lactones, pyrazines, thiazoles, thiophenes and oxazoles are important in both coffee and hazelnuts.

Lingle

Hazelnutty — An aromatic sensation created during the roasting process that combines the caramelized sugars with nut-like aromas reminiscent of filbert paste.

HEAVY

Webster

Having a high specific gravity.

Lingle

Mouthfeel term descriptive of coffee's body;

-Denotes a moderately high level of solid material suspended in the coffee beverage;

-Fine particles of bean fiber and insoluble proteins are present in pronounced amounts.

HERBY

Webster

Of, relating to, or made of, herbs.

Lingle

An aromatic sensation commonly found in the cup aroma of the coffee brew;

-Created by a highly volatile set of aldehydes and esters that become gases at the elevated temperatures of coffee brewing;

-Noted as either alliaceous-type sensations reminiscent of an aromatic vegetable (onion) or legume-type sensations reminiscent of a green vegetable (green peas).

Pangborn

Pertaining to or resembling the odor or flavor of herbs.

ICO

Grassy/green/herbal — This aroma descriptor includes three terms which are associated with odor reminiscent of freshly mowed lawn, fresh green grass or herbs, green foliage, green beans or unripe fruit.

HIDY

Lingle

An odor taint that gives the coffee beans a tallowy and leather-like odor;

-Result of breakdown of fats in the coffee beans, due to an excessive amount of heat applied in the drying process during harvesting;

-Usually associated with coffees dried by mechanical dryer.

Nestle

Coffee that smells like hides;

-Odor can come from contact with hides.

CBC

Coffee that smells like hides;

Odor can come from contact with hides.

Ukers

Coffee that has been overheated during the drying of the berries for the producing of *naturals*;

-Sometimes occurs in washed coffee, but rarely.

HONEY

Webster

A sweet viscid material elaborated out of nectar of flowers in the honey sac of various bees.

Lenoir

This note is redolent of flower-scented honeys. It also brings to mind beeswax, gingerbread, nougat and certain types of tobacco. Phenylethylic aldehyde, isolated in coffee, evokes this scent very well.

Lingle

An aromatic sensation relating to the caramelization of sugars during the roasting process. This scent is reminiscent of simple syrup, but with a floral note.

HYDROLYZED

Webster

To undergo hydrolysis.

Lingle

Process taste fault usually associated with instant coffees;

-Primarily caused by over-extraction of soluble coffee material during the brewing;

-Allowing the water molecules to break apart flavorful organic compounds and extract other components in the coffee beans that are normally not water soluble.

Nestle

Refers to conventional type of instant coffee having an undesirable acidity due to treatment;

-Generally associated with over-extraction.

INSIPID

Webster

Lacking in taste or savor.

Lingle

A taste taint giving the coffee brew a lifeless character;

-Caused by a loss of organic material in the coffee beans during the staling process after roasting;

-Result of oxygen and moisture penetrating the bean fiber prior to brewing.

INSTANT

Webster

Immediately soluble in water.

Lingle

Taste taint unique to soluble coffees;

Characterized by dominance of caramelized compounds and absence of volatile organic compounds, resulting in a substantial reduction of the overall bouquet.

Nestle

Reflects fewer of the organoleptic characteristics that typify home-brew coffee.

Sivetz

Characterized by furfurals and hydrolyzed cellular material;

-Non-volatile compounds normally not found in brewed coffee at such high levels.

LEATHER

Webster

Animal skin dressed for use.

Lenoir

This is the powerful, animal smell of well-tanned hides. In coffee, the leather scent is reminiscent of the thick leather binding on very old books that gives off the warm scent of beeswax.

Lingle

An odor taint that gives the coffee beans a tallowy like smell, which when strong and fresh is also referred to as *hidy*. It is usually associated with improper drying.

LEMON

Webster

An acid fruit that is a many-seeded pale yellow oblong berry and is produced by a small thorny tree.

Lenoir

This is the fresh, zippy, invigorating smell of lemon zest, usually associated with the fruit's acidity. It is characterized by the essence of lemon, composed of hydrocarbons and terpenic aldehydes, made from cold pressing or dry distilling the peel.

Lingle

An aromatic scent often found in coffee's fragrance reminiscent of the oil extracted from the peel of a fresh lemon.

LIGHT

Webster

Having relatively little weight in proportion to bulk.

Lingle

Mouthfeel term descriptive of coffee's body;

-A moderately low level of solid material suspended in the coffee beverage;

-Result of fine particles of bean fiber and insoluble proteins present in perceptible amounts;

-Usually associated with low coffee-to-water ratios.

LIQUORICE

Webster

The dried root of European leguminous plant used in preparing medicines, liquors, and confectionary.

Lenoir

This mellow, but highly pungent, smell is also reminiscent of that of soft brown sugar and maple syrup. It is usually found in the form of liquorice candies. The sweetness comes from cyclotene, which adds to the quality of the aromatic sensations.

Lingle

A candy-like aromatic sensation characteristic of the aroma of the extract from the liquorice root used in the manufacture of many different products.

MALTY

Webster

Of, or relating to, grain softened in water and used for brewing or distilling.

Lenoir

Malt — This is the smell of toasted malt that is completely different from the *cereal* smell of the barley where it originates. Maltol, with its smell of caramel, together with

Malty, cont.

isobutyraldehyde, are compounds which are common to both malt and coffee.

Lingle

An aromatic sensation normally found in the nose of the coffee brew

-Created by moderately volatile aldehydes and ketones found in the vapors released as the coffee brew is swallowed;

-Producing sensations reminiscent of toasted cereal grains.

Pangborn

A flavor defect suggestive of malt, and sometimes resembling the flavor of Grape-Nuts, walnuts, or maple.

ICO

Cereal/malty/toast-like —This descriptor includes aromas characteristic of cereal, malt, and toast. It includes scents such as the aroma and flavor of uncooked or roasted grain (including roasted corn, barley, or wheat), malt extract, and the aroma and flavor of freshly baked bread and freshly made toast. This descriptor has a common denominator, a grain-like aroma. The aromas in this descriptor were grouped together since tasters used these terms interchangeably when evaluating standards of each one.

MEDICINAL

Webster

Tending, or used, to cure disease or relieve pain.

Lenoir

Medicine — This sweet smell of burning is reminiscent of the taste of smoke, medicine and chemicals, and it is often linked to what is often called the Rio taste. Guaiacol, isolated coffee, displays this scent.

Lingle

A secondary coffee taste sensation related to *harsh*;

-Characterized by a penetrating sour sensation on the posterior sides of the tongue when the brew is first sipped, then replaced by a chemical sensation reminiscent of iodine as the brew cools;

-Caused by alkaloids increasing the sourness of the acids without any taste modulation of sweetness;

-Typical of natural processed coffees in which the cherries develop a bacteria infection, such as Rio coffees from Brazil.

Pangborn

Olfactory and/or gustatory sensations denoting a medicine-like flavor or odor (usually unpleasant);

-The smell and taste of disinfectants, chlorine, iodine, or some phenolic compounds.

ICO

Chemical/medicinal — this odor descriptor is reminiscent of chemicals, medicines, and the smell of hospitals. This term is used to describe coffees having aromas such as *Rio* flavor, chemical residues or highly aromatic coffees which produce large amounts of volatiles.

MELLOW

Webster

Tender and sweet because of ripeness;

-Well aged and pleasantly mild.

Lingle

A primary coffee taste sensation related to the presence of sweet tasting compounds;

-Created as salts in the coffee combine with sugars to increase the overall sweetness of the brew.

-Found most often in washed Arabica coffees grown at elevations below 4,000 feet.

-Mellow coffees range in taste from *mild* to *delicate* with the taste sensation experienced at the tip of the tongue.

Nestle

Reflects a harmonious balance in the body — not too acid, not too bitter, but dense and rich;

-Synonym: *round*.

Smith

A rounded smooth taste but lacking acidity

MILD

Webster

Moderate in action or effect;

-Synonym: *soft*.

Lingle

Secondary coffee taste sensation related to *mellow*

-Characterized by a predominately sweet tingle just past the tip of the tongue when the brew is first sipped, then replaced by a sweet sensation as the brew cools; Caused by the taste modulation of high concentrations of both sweet and salty tasting compounds;

-Typified by a washed Arabica coffee from Guatemala.

Nestle

Smooth taste typical of washed Arabica and best Brazilian coffees;

-Synonym: *soft*.

Ukers

Coffees produced mainly in countries other than Brazil;

-A term used to indicate coffees that are free from harsh *Rio* flavor.

MOLDY

Webster

Of, resembling, or covered, with a moldy fungus.

Lingle

See *musty*.

Nestle

Coffee may acquire a moldy taste if kept in poor conditions;

-Moldiness also depends on conditions during pulping and cleaning of green beans.

Pangborn

An odor or flavor suggestive of mold.

MUDDY

Webster

Turbid with sediment.

Smith

A dull indistinct and thickish flavor;

-Can be due to grounds being agitated.

MUSTY

Webster

Impaired by damp or mildew;

-Tasting of mold;

-Smelling of damp or decay.

Lingle

An odor taint giving the coffee beans a moldy odor;

-Results in fats in the coffee beans absorbing organic material from molds (fungus) on, or in contact with, the green coffee beans during the drying process;

-Also referred to as *moldy*.

CBC

A flavor often found in coffee as a result of either overheating or lack of sufficient and proper drying or aging;

-Mustiness from overheating is undesirable, while the mustiness of age is very desirable.

Sivetz

A taste akin to earthiness. Similar to a closed closet;

-Moldy.

Pangborn

Flavor similar to the odor of a damp, poorly vented cellar.

Ukers

A flavor often found in coffee as a result of either overheating or aging;

-Mustiness from overheating is undesirable, while the must of age is very desirable.

Smith

A flavor often due to poor storage, especially with Robustas;

-Can be due to lack of sufficient drying and aging or overheating;

-Mustiness due to age is undesirable.

NEUTRAL

Webster

Neither one thing nor the other;

-Neither acid nor basic.

Lingle

A secondary coffee taste sensation related to *bland*;

-Characterized by the absence of any predominant taste sensation on any part of the tongue when the brew is first sipped, then replaced by the distinct dry sensation on the sides of the tongue as the brew cools;

-Caused by a concentration of salts high enough to neutralize both the sour taste of the acids and the sweet taste of the sugars, but not high enough to evoke a salty taste sensation.

-Typified by washed Uganda Robusta coffee.

Nestle

No predominant characteristics, especially undesirable ones.

Pangborn

A sensation that is perceived, but which elicits little or no measurable response;

-Occurring when a taste or olfactory sensation is obliterated or subdues by another stimuli.

Smith

An insignificant liquor not distinct in any powerful main flavors;

-Usually a good blender.

NEW CROP

Lingle

A taste taint giving the coffee beans a slightly herbal character when brewed;

-Result of an incomplete enzymatic change in the green coffee beans during the aging process after harvesting and drying;

-Continued storage (3-6 months) ultimately eliminates this taste hint.

Sivetz

A fresh light coffee flavor and aroma which enhances the normal characteristics of a coffee blend, particularly in flavor and acidity;

-Not to be confused with the wildness or greenness, which are frequently present in new crop coffees.

NIPPY

Webster

Brisk, pungent, sharp.

Lingle

Secondary coffee taste sensation related to acidy;

-Characterized by a predominately sweet, nipping sensation at the tip of the tongue when the brew is first sipped, then replaced by a sweet sensation as the brew cools;

-Caused by higher (than normal) percentage of acids perceived as sour during the modulation of the predominately sweet taste sensation;

-Typified by a Costa Rica SHB coffee.

Pangborn

-Sharp, biting oral sensation.

NOSE

Webster

The sense of smell; olfaction.

Nose, cont.

Lingle

The sensation of the vapors released from brewed coffee as they are exhaled by the movement of the larynx while swallowing;

-Ranges from caramelly to nutty to malty.

Pangborn

The aroma of tea, liquor or wines.

NUTTY

Webster

Having a flavor like that of nuts.

Lenoir

Toasted almonds — This superb aroma of toasted almonds is reminiscent of candy made from sugared almonds or chocolate covered almonds, called *pralines*.

Lenoir

Walnuts — This is the characteristic, pungent smell of walnuts and the oil made from fresh walnuts. It is highly concentrated and redolent of curry or oxo cubes. This aroma comes mainly from sotolon, sometimes from acetaldehyde; both have been isolated in coffee.

Lingle

An aromatic sensation commonly found in the nose of the coffee brew;

-Created by moderately volatile aldehydes and ketones found in the vapors released as the coffee brew is swallowed;

-Reminiscent of roasted nuts.

ICO

This aroma is reminiscent of the odor and flavor of fresh nuts (distinct from rancid nuts), and not bitter almonds.

OILY

Webster

Of, relating to, or consisting of oil.

Lingle

See *creosoty*.

Nestle

A term sometimes used to denote a coffee that has a roasted oily taste due to a high degree of roasting.

Pangborn

Slick, greasy oral sensation.

OLD

Webster

Distinguished from an object of the same kind by being of an earlier date.

Lingle

See *stale*.

Nestle

A roasted coffee that has been left for too long changes aroma and acquires a specific and disagreeable flavor;

-Synonym: *stale*.

J. Aron

Similar to oldish, but with a stronger hay-like flavor; -A complete lack of freshness, somewhat flat taste with a slight flavor of hay.

ONIONY

Webster

Of, or related to, a widely cultivated Asiatic herb.

Lingle

See *herby* (especially *alliaceous*)

J. Aron

Flavor of onions.

ORDINARY

Webster

Poor, inferior, lacking in refinement.

J. Aron

Bland, below average quality for growth, grade, and type.

PAPER

Webster

Resembling paper in thinness or consistency.

Lingle

See *strawy*.

Nestle

Taste that paper bag packed coffee or bad quality filter paper prepared infusions may acquire;

-In an instant coffee it can be the result of certain operations.

PAST CROP

Lingle

A taste taint that gives coffee beans a slightly less acidy taste character;

-Occurs because of enzymatic changes in the coffee beans during the aging process after harvesting.

Sivetz

A flavor and aroma in which the normal characteristics of a mature, greenish coffee are weakened or toned down;

-Particularly less acidity and heavier flavor; This can also be a deterioration of these qualities into a woody or papery flavor with little or no body.

PEANUTTY

Lenoir

Roasted peanuts — This is the rich but delicate fragrance of lightly roasted peanuts and peanut oil. Certain types of coffee have a natural tendency to give off this scent, called the *Greek taste*, because the Greeks often add raw peanuts to green coffee beans to enhance it.

Lingle

An aromatic sensation created at the beginning of the roasting process as aldose and ketose sugars combine with amino acids in the initial phase of the Maillard reaction. It is highly reminiscent of roasted, but unshelled, peanuts.

PEASY

Webster

Of, or related to, any of various leguminous plants cultivated for their rounded smooth or wrinkled edible protein-rich seeds.

Lingle

See *garden pea*.

J. Aron

A disagreeable taste of very fresh green peas.

PEPPER

Webster

Either of two pungent seeds (black or white) from the fruit of an East Indian plant that are used as a condiment, carminative or stimulant.

Lenoir

This is the intense, almost metallic odor associated with the piquant, fiery taste of pepper. This essence, made up of terpenic hydrocarbons, is obtained by steam-distilling freshly ground black pepper. Some of its constituents can be found in coffee.

Lingle

An aromatic sensation created by the dry distillation of the bean fiber during roasting. This complex scent is reminiscent of crushed pepper corns, with a warm spicy sensation.

PIQUANT

Webster

Agreeable stimulating to the palate.

Lingle

A secondary coffee taste sensation related to *acidy*;

-Characterized by a predominately sweet, prickling sensation at the tip of the tongue when the brew is first sipped, then replaced by a sweet sensation as the brew cools;

-Caused by higher (than normal) percentage of acids perceived as sweet during the modulation of the predominately sweet taste sensation;

-Typified by a Kenya AA coffee.

Pangborn

Agreeable, stimulating to the palate;

-Pleasant tart, sharp, or biting;

-Pungent.

POINT

Webster

A distinguished detail.

Lingle

See *piquant*.

J. Aron

A coffee with good positive characteristics of flavor, body, and activity.

Smith

A fine acidy sharpness.

POOR

Webster

Inferior in quality or value.

Nestle

Qualifies a coffee of a really common flavor.

POTATO

Webster

An erect American herb of the nightshade family widely cultivated as a vegetable crop.

Lenoir

This is the smell of skins of boiled potatoes. This particular aroma comes from methional, which appears during roasting. This is one of the most frequent aromas in coffee, although it does not dominate. If it does, it would indicate the beans had not been sorted carefully enough.

Lingle

See *herby* (especially leguminous).

J. Aron

A disagreeable and very unpleasant taste of raw potato.

Smith

Same as the 'erpsig' flavor.

PRIMARY COFFEE TASTE SENSATIONS

Lingle

Acidy, mellow, winey, bland, sharp, and soury;

-Result of the process of taste modulation;

-Created as the basic taste sensations interact with one another, depending on the relative strength of each;

-Basis for grouping together coffees of similar taste.

PROCESS TASTE

Nestle

This term reflects a number of defects

-Some technological treatment in producing coffee can develop well-identified off-flavors — cooked, caramelized, cereal, and acrid.

PULPY

Webster

The soft, succulent, usually mesocarpie part of the fruit.

Lingle

See *fruity*.

J. Aron

Strong, pungent, fruit-like flavor from coffee cherry skins.

PUNGENT

Webster

Causing a sharp or irritating sensation.

Lingle

A primary coffee taste sensation related to the presence of bitter tasting compounds;

-Created as the alkaline and phenolic compounds combine with the salts to increase the overall bitter taste of the brew;

-Found most often in dark roast coffees due to the extensive pyrolysis of the bean fiber;

-Creating a high percentage of phenolic (bitter tasting) compounds that replace sweet in the basic taste modulation;

-Pungent coffees range in taste from *creosoty* to *alkaline* with the taste sensation experienced at the back of the tongue.

Nestle

Applies essentially to a full-bodied and slightly aggressive coffee.

Sivetz

A prickling, stinging, or piercing sensation;

-Not necessarily unpleasant;

-e.g., pepper or snuff, fruit aldehydes.

Pangborn

A sharp, stinging, or painful sensation of a flavor or odor, such as that of aldehyde C-9 and aldehyde C-10.

QUAKERY

Lingle

A taste taint giving the coffee brew a pronounced peanutty flavor; Result of the presence of very light-colored, undeveloped roasted coffee beans; Caused by picking unripe, green coffee cherries during harvesting.

Nestle

Term applied to unripe, blighted or underdeveloped coffee beans.

CBC

Term applied to unripe, blighted or undeveloped coffee beans; While a number of them will effect the quality of the cup, a few quakers are not considered harmful to the cup quality; they will, however, roast lighter than sound coffee and are therefore considered undesirable.

Sivetz

Peanutty flavor caused by undeveloped dead beans, which appear very light colored when roasted.

RANK

Webster

Offensively gross or coarse;

-Foul, rancid, putrid.

Smith

A dirty unpleasant flavor due mainly to contamination or over-fermentation.

RANCID

Webster

Having a rank smell or taste.

Lingle

A taste fault giving the coffee brew a highly displeasing taste;

-The result of a chemical change in the roasted coffee beans due to the presence of oxygen and moisture;

-Caused by hydrolysis of the proteins and oxidation of the fats during the staling process after roasting.

Nestle

The rancid flavor of a roasted coffee is caused by oxidation of the fats.

Pangborn

Having a rank odor or taste, as that of old oil;

-Characterized by aldehyde C-9 or aldehyde C-10.

ICO

Rancid/rotten — This aroma descriptor includes two terms which are associated with the odors reminiscent of deterioration and oxidation of several products. Rancid as the main indicator of fats oxidation mainly refers to rancid nuts, and rotten is used as an indicator of deteriorated vegetables or non-oily products. Tasters should be cautioned not to apply these descriptors to coffees that have strong notes but no signs of deterioration.

RICH

Webster

Highly seasoned, fatty, oily, or sweet; as in foods;

-Pungent, as in odors.

-Having high value or *quality*.

Lingle

Quantitative description of coffee's bouquet;

-Denoting the presence of a complete set of gases and vapors present in the fragrance, aroma, nose, and after-taste of the coffee being evaluated;

-Indicates the gases and vapors are present in a highly pronounced intensity.

Nestle

Qualifies a full coffee that has a very developed body, flavor, and especially high degree of aroma.

Smith

An overall lively full bodied flavor.

RIOY

Lenoir

The Rio taste — Coffees from Rio de Janeiro have a character all of their own, with a taste that is rarely found in other coffees. It comes from a type of mold whose odor is often described as a little like phenol and chloride with a hint of pepper. This taste is brought mainly by a chloride constituent derived from phenol, and is one of the most powerful molecules in existence.

Lingle

A taste fault giving the coffee beans a highly pronounced medicinal (iodine-like) character;

-The result of continued enzyme activity when the coffee beans remain inside the fruit while the fruit is allowed to partially dry on the shrub;

-Usually associated with natural processed Arabica coffees grown in Brazil and shipped through the port of Rio de Janeiro.

Nestle

An unpleasant medicinal flavor of the lowest quality of Brazil coffees — slightly iodized phenolic or carbolic;

-This property, easy to detect (especially in infusion) but difficult to describe, cannot be hidden by blending.

CBC

A heavy and harsh taste characteristic of coffees grown in the Rio district of Brazil and sometimes present even in fancy mild coffees.

J. Aron

With particular reference to Brazils, a slight iodine-like flavor;

-Can be very pungent.

Sivet

An unpleasant, medicinal flavor, with possibly woody or fermented overtones, similar to iodine;

-A property that cannot be hidden by blending.

Ukers

Rio flavor — A heavy and harsh taste characteristic of coffees grown in the Rio district of Brazil, and sometimes present even in fancy mild coffees.

ROASTY

Webster

To dry and parch by exposure to heat.

Nestle

The relative strength of the natural components of the coffee flavor is modified by the degree of roasting, resulting in high character.

ROUGH

Webster

Characterized by harshness.

Lingle

-Secondary coffee taste sensation related to *sharp*.

-Characterized by a predominately rasping, parching sensation on the anterior sides of the tongue;

-Caused by the addictive property of salty taste sensations;

-Typified by an unwashed Angola Robusta coffee.

Nestle

A harsh coffee that rasps the palate or the tongue;

-Synonym: *harsh*.

Pangborn

Term used to describe degree of astringency, particularly wine.

ROUNDED

Webster

Full, complete.

Lingle

Quantitative description of coffee's bouquet.

-Denoting the presence of an incomplete set of gases and vapors present in the fragrance, aroma, nose, and after-taste of the coffee being evaluated;

-Indicates the gases and vapors are present in only moderately perceptible amounts.

Nestle

A balanced coffee whose basic organoleptic characteristics are just at the right level, with none particularly apparent, giving an impression of roundness;

-Synonym: *balanced*.

RUBBERY

Webster

Of, or related to, an elastic substance obtained by coagulating the milk juice of any various tropical plants.

Lenoir

Rubber — This smell figures prominently in certain coffees and should not be described negatively. It often mingles with earthy or vegetable notes, and other permanent features of robustas Ethy-3-furfuryl-mercaptoproprionate reproduces. The exact odor of rubber as it is found in coffee.

Lingle

A taste fault giving the coffee beans a highly pronounced burnt-rubber character;

-Result of continued enzyme activity if the coffee beans remain inside the fruit while the fruit is allowed to partially dry on the shrub.

-Usually associated with processed Robusta coffees in Africa.

CBC

-Term usually applied to the taste of Robustas.

Pangborn

Odor of natural or synthetic rubber, characterized by paratertiary butyl phenol.

Sivetz

An odor similar to heated rubber car tires on pavement.

-Robustas have this usually undesirable but characteristic odor. instant coffee held at above 120°F for days develop such an odor with sickening overtones.

Ukers

Term usually applied to the taste of Robustas.

Smith

Mainly prevalent in Robustas, especially Indonesians.

ICO

Rubber-like — This odor descriptor is characteristic of the smell of hot tires, rubber bands and rubber stoppers. It is not considered a negative attribute but has a characteristic strong note highly recognizable in some coffees.

SALT

Webster

Being or inducing one of the four basic taste sensations.

Lingle

Basic taste characterized by solutions of chlorides, bromides, iodides, nitrates, and sulfates of potassium and lithium;

perceived primarily by the fungiform and foliate papillae on the anterior sides of the tongue.

Pangborn

Salty — A quality of taste sensation of which the taste of sodium chlorides is a typical example;

-Synonym: *saline*.

ICO

Saltiness — Primary taste characterized by a solution of sodium chloride or other salts.

SCORCHED

Webster

Burned on the surface so as to change its color and texture.

Lingle

An odor taint that gives the coffee brew a slight after-taste of a phenolic and pyridine (smoky-burnt) character, with an under-development of the normal caramelization result of applying too much heat too quickly and charring the surface of the bean during the roasting process.

SECONDARY COFFEE TASTE SENSATIONS

Lingle

Created when the primary coffee taste sensations are dominated by the influence of a single basic taste:

Acidy coffees range from *piquant* to *nippy*;

Mellow coffees range from *mild* to *delicate*;

Winey coffees range from *tangy* to *tart*;

Bland coffees range from *soft* to *neutral*;

Sharp coffees range from *rough* to *astringent*;

Soury coffees range from *hard* to *acrid*;

-Perception of the sensation is effected by temperature of the brew.

SHARP

Webster

Effecting the sense organs intensely, as in having a strong odor or flavor;

-Acrid, hash, brisk, caustic.

Lingle

A primary taste sensation related to the presence of salty tasting compounds;

-Created as the acids in the coffee combine with the salts to increase the overall saltiness of the brew;

-Found most often in unwashed Robusta coffees, such as coffee from the Ivory Coast in Africa;

-Sharp coffees range in taste from *rough* to *astringent* with the taste sensation experienced on the sides of the tongue.

Pangborn

Characterizing an intense or painful, well-localized reaction to a substance being eaten or smelled;

-e.g., various acids and alcohols.

SMOKY

Webster

Suggestive of smoke especially in flavor or odor.

Lenoir

Smoke — The very symbol of volatility, this is the smell given off by certain types of wood and resins as they burn; it is a pleasant odor and lends its flavor to smoke foods. Polyphenols are an essential part of the smell of smoke. This is basically the hallmark of the last phase in coffee roasting. Further roasting would generate odors of tar.

Lingle

An aromatic sensation common to dark roasts created by exhaustive dry distillation of the bean fibers. It is an aroma created by various phenolic compounds and is reminiscent of creosole.

SMOOTH

Webster

Causing no resistance to sliding.

Lingle

Coffee mouthfeel sensation caused by a moderately low level of oily material suspended in the coffee beverage;

-Result of moderate amounts of fats present in the green coffee beans.

Pangborn

Having an even surface of consistency;

-Devoid of roughness.

Smith

A full body but low acid coffee.

SOFT

Webster

Having a bland or mellow rather than sharp or acid taste or flavor.

Lingle

A secondary coffee taste sensation related to *bland*;

-Characterized by an absence of any predominant taste sensation on any part of the tongue, except for a subtle dryness;

Caused by a concentration of salts high enough to neutralize the acids but not high enough to neutralize the sugars;

Typified by a washed Arabica coffee from Santos, Brazil.

Pangborn

Effecting the senses in a gentle and pleasant way; Lacking in harshness, stiffness, coarseness, acidity, or like qualities offensive to taste, sight, hearing or touch.

Smith

A well-rounded flavor lacking any harshness or acidity.

SOUND

Webster

Free from flaw, defect, or decay.

Lingle

Free from any odor taint or taste fault attributable to improper harvesting and drying methods.

J. Aron

A coffee with no particular positive characteristic and devoid of negative characteristics;

-Usually covering at least five cups of one particular coffee.

Ukers

Coffee in merchantable condition.

SOUR

Webster

Causing or characterized by the basic taste sensation produced chiefly by acids.

Lingle

A basic taste sensation characterized by solutions of tartaric acid, citric acid, or malic acid;

-Perceived by the foliate and fungiform papillae in the posterior sides of the tongue.

Pangborn

The taste sensation caused by acids.

ICO

Sourness — This basic taste descriptor refers to an excessively sharp, biting and unpleasant flavor (such as vinegar or acetic acid). It is sometimes associated with the aroma of fermented coffee. Tasters should be cautious not to confuse this term with acidity which is generally considered a pleasant and desirable taste in coffee.

SOURY

Webster

Usually applies to something that has lost its natural sweetness.

Lingle

A primary coffee taste sensation related to the presence of sour tasting compounds;

-Created as the salts in the coffee combine with the acids to reduce the overall sourness of the brew;

-Found most often in unwashed Arabica coffees grown in Brazil at elevations below 2,000 feet, such as unwashed Arabica coffee from Ethiopia;

-Soury coffees range in taste from *hard* to *acrid* with the taste sensation experienced on the sides of the tongue.

Nestle

The unpleasant acidity of a sour coffee cannot be confused with the natural acidity of some coffees in which this quality is prized;

-See: *acid* and *astringent*.

Sivetz

Unpleasant flavor having a sharp, acid taste;

-Different from acidity.

Smith

A sharp excessively acidic biting flavor.

SPICY

Webster

Of, or relating to, any of various aromatic vegetable products (as pepper or nutmeg) used to season or flavor foods.

Lingle

An aromatic sensation commonly found in the after-taste of the coffee brew;

-Created by a slightly volatile set of hydrocarbon compounds found in the vapor released after the coffee brew is swallowed;

-Reminiscent of either wood-spice (cinnamon bark) type sensations or wood-seed (clove bud) type sensations.

Pangborn

Flavored with, containing, or characteristic of a spice or spice complex;

-Aromatic; piquant; pungent.

ICO

This aroma descriptor is typical of the odor of sweet spices such as cloves, cinnamon, and allspice. Tasters are cautioned not to use this term to describe the aroma of savory spices such as pepper, oregano, and Indian spices.

STALE

Webster

Tasteless or unpalatable from age.

Lingle

A taste fault giving the coffee brew an unpleasant taste; A result of moisture and oxygen penetrating the bean fiber and adversely effecting the organic material;

-Occurs in the staling process after roasting.

Nestle

-See: *old*.

Pangborn

Not fresh;

-Vapid or tasteless from age, such as stale beer, stale bread, or stale nonfat milk powder.

Sivetz

A sweet but unpleasant flavor;

-Aroma of roasted coffee which reflects the oxidation of the unpleasant volatile aldehydes and the loss of others.

STEWED

Webster

To become cooked by boiling slowly or simmering with heat.

Stewed, cont.

Nestle

A taste of coffee infusion that has been heated after cooling and has lost its initial aroma.

STINKER

Webster

Something of very poor quality.

J. Aron

A coffee with no particular positive characteristics and devoid of negative characteristics;

-Usually covering at least five cups of one particular coffee.

STRAWY

Webster

Of, or relating to, a dry coarse stem of a cereal grass.

Lenoir

Straw — This is the penetrating smell of the stalks of cereals left standing in the fields after harvest. A warm, grassy fragrance akin to that of cut hay.

Lingle

A taste taint that gives the coffee beans a distinct hay-like character;

-Result of the loss of organic material from the green coffee beans while in storage;

-Occurs in the aging process after harvesting.

STRONG and FULL

Webster

Strong — Rich in some active agents, as in a flavor or extract;

-Ionizing freely in solution, as with acids and bases.

Lingle

Strong — Taste term denoting a high concentration of soluble material in the coffee brew.

Nestle

Coffee giving a pungent, ristretto-type impression in the cup, rich in flavor.

-Developed by roasting or having consistent mouthfeel.

SWEATY

Webster

Of, or related to, moisture issuing from or gathering in drops on the surface.

Lingle

Sweated — Taste taint in green coffee beans resulting from improper storage conditions;

-Can range from pleasantly similar to *aged* coffee to unpleasantly similar to strong cheese or perspiration;

-Originally applied to coffees damaged during shipment by steamer.

J. Aron

A coffee, probably fading or faded, that has been stored for some time in less-than-ideal conditions and results in a distinct sweaty taste.

Ukers

Sweated — Green coffee that has been submitted to a steaming process to give the beans the extra-brown appearance: Artificial *sweating* is illegal and classified as adulteration and misbranding under the Pure Food and Drug Act of 1906.

SWEET

Webster

Being, or including, one of the four basic taste sensations that is typically induced by disaccharides and is mediated especially by receptors in taste buds at the front of the tongue.

Lingle

A basic taste characterized by solutions of sugars (sucrose and glucose), alcohols, glycols, and some acids (amino acids);

-Perceived primarily by the fungiform paillae at the tip of the tongue.

CBC

Trade term to describe coffee free from harshness of Rio flavor or any form of damage.

Pangborn

A quality of taste sensation of which the taste of sucrose is a typical example.

Sivetz

A pleasant, clean taste.

Ukers

A trade term to describe coffee which is free from harshness or Rio flavor or any form of damage.

Smith

A nice clean soft coffee free of any harshness.

ICO

Sweetness — This is a basic taste descriptor characterized by solutions of sucrose or fructose which are commonly associated with sweet aroma descriptors such as fruity, chocolate and caramel. It is generally used for describing coffees with are free from off-flavors.

SWEETLY FLORAL

Lingle

An aromatic sensation commonly found in the fragrance of roasted and ground coffee beans;

-Created by a highly volatile set of aldehydes and esters found in the gases (principally carbon dioxide) that escape from the newly ruptured cells of the bean fiber;

-Reminiscent of fragrant flowers, such as jasmine.

ICO

Floral — This aroma descriptor is similar to the fragrance of flowers. It is associated with the slight scent of different

types of flowers including honeysuckle, jasmine, dandelion and nettles. It is mainly found when an intense fruity or green aroma is perceived but rarely found having a high intensity by itself.

SWEETLY SPICY

Lingle

An aromatic sensation commonly found in the fragrance of roasted and ground coffee beans;

-Created by a highly volatile set of aldehydes and esters found in the gases (principally carbon dioxide) that escape from the newly ruptured cells of the bean fiber;

-Reminiscent of aromatic spices, such as cardamom.

TAINTED

Webster

To touch or effect slightly with something bad.

Lingle

Flavor defect, usually limited to the aromatic properties of the flavor.

J. Aron

A coffee with a slightly defective flavor.

Pangborn

General flavor defect, such as feed flavor in milk.

TANGY

Webster

A sharp, distinctive, often lingering flavor;

-Implies a sharp, penetrating savor.

Lingle

A secondary coffee taste sensation related to *winey*;

-Characterized by a predominately darting, sour sensation along the anterior sides of the tongue;

-Caused by a higher (than normal) percentage of sugars, which gives that taste almost a fruity sensation;

-Typified by an unwashed India Arabica coffee.

Pangborn

Having a sharp, tart taste.

TARRY

Webster

Of, resembling or covered with tar.

Lingle

A taste fault giving the coffee brew an unpleasant burnt character;

-Result of excessive heat scorching the proteins in the brew;

-Occurs during the holding process after brewing.

Pangborn

-Suggestive of the odor of tar, such as the odor of carvacrol.

TART

Webster

Pleasingly sharp to the taste;

-Biting, pungent, sour.

Lingle

A secondary coffee taste sensation related to *winey*;

-Characterized by a predominately biting, sour sensation along the anterior sides of the tongue.

-Caused by a higher (than normal) percentage of sour acids, almost giving the taste a puckering sensation.

-Typified by an unwashed Arabica coffee from Kivu, Congo.

Pangborn

See *sour.*

TEA ROSE

Lenoir

-This is the scent of the celebrated rose of Damascus grown in Turkey and Bulgaria. The scent comes from B-Damascenone, which has been isolated in essential oil from the Bulgarian rose and is also found in coffee. This predominant, captivating fragrance confers freshness on the coffee.

Lingle

An aromatic sensation found in the fragrance of freshly roasted and ground coffee, denoting a floral character.

THICK

Webster

Viscous in consistency.

Lingle

Coffee mouthfeel sensation caused by a relatively high level of solid material suspended in the coffee beverage;

-Result of fine particles of bean fiber and insoluble proteins present in substantial amounts;

-Most often characteristic of espresso-style coffee beverages.

THIN

Webster

Not dense, lacking in viscosity.

Lingle

Coffee mouthfeel sensation caused by a relatively low level of solid material suspended in the coffee beverage;

-Result of fine particles of bean fiber and insoluble proteins present in only slightly perceptible amounts;

-Most often characteristic of low coffee-to-water ratio brews prepared through a paper filtering device.

Nestle

Refers to a drink prepared with too much water;

-Lacks body or substance and is insufficiently concentrated and roasted;

-In extreme cases, such a coffee would be termed *watery.*

Thin, cont.

Pangborn

Lacking in substance, richness, strength, or density, relative to flavor or texture.

Smith

A flat, lifeless coffee lacking any body or acidity which can be caused if it is underbrewed.

TIPPED

Webster

To remove the ends of something.

Lingle

A taste taint giving the coffee brew a cereal-like taste;

-Result of heat being applied too quickly in the roasting process, charring the tips of the beans.

CBC

Tipping — Charring the ends of the coffee bean during the roasting process, by applying an intense heat too quickly.

Ukers

Tipping — Charring the little germ at the end of the coffee bean during the roasting process, by too quickly applying intense heat.

TOAST

Webster

To make crisp, hot and brown by heat.

Lenoir

The pungent smell of bran plays a key role in the aroma of toasted bread and blends perfectly with the smell of coffee. Acetyl-2-pyrazine, isolated in coffee, is partly responsible for this smell.

Lingle

An aromatic sensation created in the early stages of the roasting process reminiscent of toasted bread crusts.

TOBACCO

Webster

The leaves of cultivated tobacco plants prepared for use in smoking or chewing or as snuff.

Lenoir

Pipe tobacco — Redolent of burning tobacco leaves, this smell also is reminiscent of a fire crackling underneath the dead leaves in autumn. It is usually a combination of dry vegetal scents and toasty notes.

Lingle

An after-taste found in some coffees reminiscent of cigarette smoke.

ICO

This aroma descriptor is reminiscent of the odor and taste of tobacco but should not be used for burnt tobacco.

TURPENY

Webster

Turpentineous — Of, or related to, an oil obtained by distillation or carbonization of pinewood.

Lingle

An aromatic sensation commonly found in the after-taste of the brewed coffee;

-Created by a slightly volatile set of hydrocarbon compounds and nitrates found in the vapor released after the coffee brew is swallowed;

-Reminiscent of either resinous sensations or medicinal sensations similar to camphor-like substances.

TWISTY

Webster

Idiosyncrasy: an unexpected turn or development.

Lingle

See *wild*.

J. Aron

A coffee showing differing negative characteristics from cup to cup;

-In a single cup, a coffee with characteristics that are dubious as to its reliability

UNCLEAN

Webster

Infected with a harmful contagion.

Nestle

Having an off-flavor;

-Generally depends on the geographical origin of the beans and how they have been treated, e.g., pulping.

J. Aron

A flavor slightly similar to fermented but without the pungent rotting taste.

UNDEFINABLE FLAVOR

J. Aron

A coffee with an 'off' taste that cannot be categorized.

VANILLA

Webster

A crystalline phenolic aldehyde that is extracted from vanilla beans.

Lenoir

This is the warm, sensual, slightly buttery and surprisingly powerful smell of vanilla pods, the fruit of the orchid. The primary source is vanillin, a molecule that is often present in the form of crystals on the surface of the pods. A basic permanent feature, essential to the balance of coffee's aroma, vanillin fixes and strengthens the other aromatic compounds.

Lingle

An aromatic sensation found in roasted coffee created as part of the sugar browning reactions occurring during the roasting process. Reminiscent of vanillin, it is not a dominant characteristic and is often blended in with other aromatic compounds.

VAPID

Webster

Lacking liveliness, tang, briskness or force;

-Flat, uninteresting.

Lingle

An odor taint in the coffee brew marked by a loss of organic material that would normally be in a gaseous state in both the aroma and nose of the brew;

-The result of the effect of elevated temperatures driving out the gaseous molecules trapped in the brew during the holding process after brewing;

-Can also be the result of loss of organic material from the roasted coffee bean during the staling process after roasting.

Pangborn

Absence of character, spirit, zest;

-Insipid, dull, flat.

WATERY

Webster

Felt to resemble water or watery matter;

-Especially in thin fluidity, soggy texture, paleness or lack of savor.

Lingle

Coffee mouthfeel sensation caused by a relatively low level of oily material suspended in the coffee beverage;

-Result of slightly perceptible amount of fats present in the green beans;

-Most often characteristic of extremely low coffee-to-water ratio brews.

Pangborn

Diluted flavor;

-Lacking in intensity of flavor, flat.

WEAK

Webster

Dilute, as in coffee;

-Lacking normal intensity or potency.

Lingle

Coffee taste term denoting a low level of soluble material in the brew.

Nestle

Coffee that lacks body but is not flat.

WILD

Webster

Deviation from the natural or expected course.

Lingle

A taste fault in the coffee beans characterized by extreme variations between sample cups;

-Usually marked by unpleasant sourness;

-Result of either internal chemical changes in the green beans or external contamination.

J. Aron

See *twisty*.

Sivetz

Wildness — Extreme flavors, sour or fermented, found in poorly prepared coffees, mostly *naturals*.

Smith

A gamey flavor often in Ethiopian coffees.

WINEY

Webster

Having the taste or quality of wine.

Lingle

A primary coffee taste sensation related to the presence of sour tasting compounds;

-Created as the sugars in the coffee combine with the acids to reduce the overall sourness of the brew;

-Found most often in unwashed Arabica coffees grown at elevations above 4,000 feet, such as an unwashed Djimma coffee from Ethiopia;

-Winey coffees range in taste from *tangy* to *tart* with the taste sensation experienced on the sides of the tongue.

Nestle

Special and agreeable flavor acquired by certain mocha-type (Abyssinia) coffees;

-Freshly milled, or first crop coffees.

Sivetz

Reminiscent of wine flavor and body;

-Usually in high grown coffees.

Smith

A rich rounded full body coffee with a smoothness characteristic of well matured red wine;

-A flavor which is prevalent with Colombians.

ICO

This term is used to describe the combined sensation of smell, taste and mouthfeel experiences when drinking wine. It is generally perceived when a strong acidic of fruity note is found. Tasters should be cautioned not to apply this term to a sour or fermented flavor.

WISHY-WASHY

Webster

Weak, insipid.

J. Aron

Negative in all respects but with no defective flavor.

WOODY

Webster

Characteristic or resembling the taste of wood.

Lingle

A taste fault giving the coffee beans a distinct, unpleasant wood-like character;

-result of an almost complete loss of organic material in the green beans during storage, as the final change during the aging process.

-makes the coffee unusable for commercial purposes.

Nestle

Reminiscent of the odor and taste of dry wood;

-May be due to presence of imperfect beans (spongy white beans or dry beans), the roasting of which is unable to develop the aromatic characteristics.

-Or may be due to the use of an old coffee that has lost its specific aroma and retains only the woody elements.

CBC

-Green coffee that has deteriorated and lost its commercial value.

Sivetz

A taste caused by deterioration of the coffee;

-Akin to wood or paper.

Ukers

-Green coffee which has deteriorated and lost its commercial value.

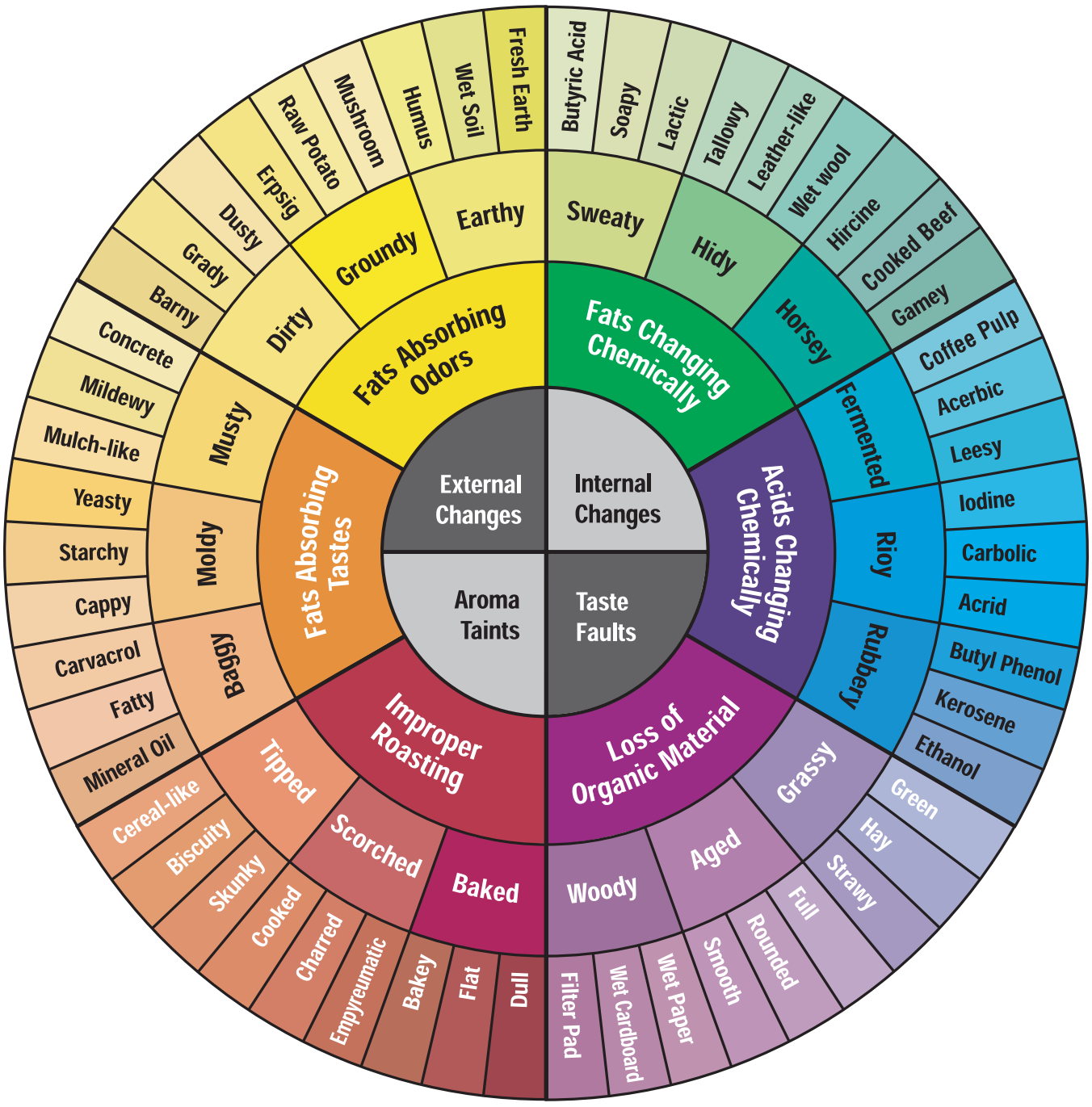
Smith

-a hard wood-like flavor often due to old coffee which has been stored too long as green beans.

ICO

-this aroma descriptor is reminiscent of the smell of dry wood, an oak barrel, dead wood or cardboard paper.

Coffee Taster's Flavor Wheel



Taints & Faults

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