SENSORY SKILLS

Sensory skills

SCAE
COFFEE
DIPLOMA

SENSORY INTERMEDIATE

BLOOMS TAXONOMY: Remembering / Understanding

Level 3: Application – Use information in a new way				
Translate	Illustrate	Sketch	Sequence	Prepare
Interpret	Operate	Employ	Carry	Generalise
Apply	Demonstrate	Schedule	Out	Repair
Practice	Dramatise	Use	Solve	Explain

Level 4: Analysis – Distinguish the different parts				
Distinguish	Contrast	Relate	Classify	Catalogue
Differentiate	Calculate	Experiment	Discover	Investigate
Appraise	Criticise	Estimate	Discriminate	Breakdown
Analyse	Examine	Observe	Identify	Order
Compare	Test	Detect	Explore	Recognise
Determine				

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
1.0 HOW WE TASTE, PERCEIVE AND INTERPRET - GENERALITIES			
1.01.01	**WHAT IS SENSORY ANALYSIS** Sensory evaluation has been defined as a scientific method used to evoke, measure, analyse and interpret those responses to products as perceived through the senses of sight, smell, touch, taste and hearing (Stone and Sidel, 2004) Lawless, HT and Heymann , H completed this definition by distinguishing four phases to sensory evaluation: **- "Evoke**": understand the products and define their presentation conditions to control potential bias **- "Measure":** sensory is a quantitative science in which data are collected establish relationships between product characteristics and human perception (sensory or more elaborated such as liking, etc..) **- "Analyse":** Proper statistical analysis is a critical part of sensory testing. Statistical methods are used to determine if the relationships between product characteristics are likely to be real and not due to uncontrolled variations **- "Interpret":** It is important to consider the method used, its limitations to make a decision within the context of the study	L3, L4	Stone, H and Sidel, JL (2004) Sensory Evaluation practices, 3rd Edition Academic, San Diego Lawless, HT, Heymann, H (2010) Sensory Evaluation of Food Principles and Practices 2nd Edition Springer, New York Meilgaard, M & co (1999) Sensory evaluation techniques 3rd Edition CRC Press LLC, Boca Raton, FL Carpenter, RP & co (2000) Guidelines for Sensory Analysis in Food Product Development and Quality Control 2nd Edition Aspen Publishers, Gaithersburg, MD Castriota-Scanderbeg, A et al "The appreciation of wine by sommeliers: a functional magnetic resonance study of sensory integration"

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1.01.02	Explain the challenge of working with a human measuring instrument that is highly variable across the population and over time Working in sensory science requires that you can demonstrate knowledge in the following disciplines: sensory physiology, psychology, experimental design and statistics Differentiate between the objective judgment of the trained taster from the subjective judgment of the consumers Explain a panel set up typically requires: • Trained tasters 6 to 40 making a panel • Standard questions/questionnaires • Preparation protocol • Test design • Analysis • Facilities Explain the panel aims to: • Identify • Discriminate • Describes • Compares • Investigate • Hedonic • Judgment (preference, liking)	L3, L4	Stone, H and Sidel, JL (2004) Sensory Evaluation practices, 3rd Edition Academic, San Diego Lawless, HT, Heymann, H (2010) Sensory Evaluation of Food Principles and Practices 2nd Edition Springer, New York Meilgaard, M & co (1999) Sensory evaluation techniques 3rd Edition CRC Press LLC, Boca Raton, FL Carpenter, RP & co (2000) Guidelines for Sensory Analysis in Food Product Development and Quality Control 2nd Edition Aspen Publishers, Gaithersburg, MD Castriota-Scanderbeg, A et al "The appreciation of wine by sommeliers: a functional magnetic resonance study of sensory integration"
1.02.01	**WHY IS SENSORY IMPORTANT IN COFFEE** Sensory Evaluation role: - Identify which sensory profiles are preferred by end users - Relate sensory profiles and other product characteristics: physical, chemical, recipe, process - Scope: quality control, product development, marketing innovation, consumer acceptance and communication Technique widely used in food industry extended to others (car, perfumery, tobacco, pharmacy, etc …),. for Quality Control, or Product Development	L3, L4	Lingle (2001) Muñoz, AM, Civille, GV and Carr, BT (1992) Sensory Evaluation In Quality Control Van Nostrand Reinhold, New York. Yantis, JE [Ed] (1992) The Role of Sensory Analysis in Quality Control ASTM. West Conshohocken, PA

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1.02.02	Recall that cupping seeks to: • Identify potential defects and taints • Identify positive flavours and their quality • Evaluate intensity • Record the results Explain that sensory analysis establishes a general picture of a coffee's potential that can be refined and adjusted to various green coffee selection, blending and brewing practices	L3, L4	Lingle (2001) Muñoz, AM, Civille, GV and Carr, BT (1992) Sensory Evaluation In Quality Control Van Nostrand Reinhold, New York. Yantis, JE [Ed] (1992) The Role of Sensory Analysis in Quality Control ASTM. West Conshohocken, PA
2.0 PHYSIOLOGY AND SENSORY ATTRIBUTES			
2.01.01	**PHYSIOLOGY** (be general) The Senses: • Mouth (taste buds) • Nose (olfactory bulb) Examples: • Sugar • Cinnamon		
2.02.01	**PSYCHOLOGICAL** (be general) The human as the measurement instrument Its limits: bias Example: Wine – Grand Cru vs mainstream: Which one is better Example: Hawaii Kona and Brazil NY2 FC: Which is more aromatic		
2.03.01	**TASTE AND TEXTURES IN THE CONTEXT OF COFFEE MAIN FOCUS OF THE COURSE** There are 5 prototypical tastes All coffees are naturally acid, bitter and have a sweet perception (more than they are physically sweet) Show: • Astringency • Body • Pungent • Sweet perception	L3, L4	
2.03.02	Be able to recognise different tastes Ability to discriminate between, and rank, four levels of acidity and bitterness in solution	L3, L4	
2.04.01	**DEFINE POSITIVE AND NEGATIVE AROMAS IN COFFEE** (below Aroma and Flavour) Recognise and categorise key positive aromas in coffee	L3, L4	

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2.04.02	Smell positive aromas	L3, L4	
2.05.01	**AROMAS AND FLAVOURS IN THE CONTEXT OF COFFEE** Green coffee contains aroma precursors. Roasting consists in a variety of chemical reactions aiming to create aromas. Brewing does not produce any new volatiles, but merely extracts a percentage of what is in a roasted bean Model SCAA/SCAE i) fruity, flowery, herbal ii) nutty, caramel, chocolaty iii) turpeny, spicy, carbon-like	L3, L4	
2.05.02	Describe blind aroma of cola syrup or grenadine syrup; realise the diversification of descriptors Accurately categorise and identify key aromas present in coffee	L3, L4	
3.0 TRIANGLE TEST			
3.01.01	**SCOPE OF APPLICATION** Is there a difference, are products similar?		
3.02.01	**DEFINITION AND DESCRIPTION** Out of the three, which is the odd sample? Definition, questionnaire, experimental design (6 permutations) Three digit codes Number of assessors (18 for difference, 36 for similarity)	L3, L4	See What is sensory evaluation
3.02.02	Conduct a triangle test on two coffees, eventually repeat triangle to reach 24 to 30 answers	L3, L4	See What is sensory evaluation
3.03.01	**STATISTICAL ANALYSIS** Principle of the statistic test Table, risk α and β Test for difference, similarity		
3.04.01	**ALTERNATIVE METHODS** Mention duo – trio; pair test		
4.0 RUNNING A CUPPING SESSION AND TASTING THE DIVERSITY OF COFFEE – CUPPING GENERALITIES			
4.01.01	**WHAT IS CUPPING** It is a sensory analysis process specific to coffee “Coffee cupping is a method used to systematically evaluate the aroma and taste characteristics of a sample of coffee beans” – (Ted Lingle 2001)	L3, L4	SCAA Lingle ‘Coffee Cuppers Handbook’

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4.01.02	Repeat a definition of cupping	L3, L4	SCAA Lingle 'Coffee Cuppers Handbook'
4.02.01	**KEY TERMINOLOGY/SENSORY VOCABULARY** Cupping coffee with: **Eye:** colour, froth, crema **Nose:** aroma categories (see point 5) **Mouth:** basic tastes and mouthfeel	L3, L4	Coffee – Sensorial Analysis – Vocabulary ISO TC 34/SC 15N 2113
4.02.02	Match key cupping terminology phrases with an explanation of the terms	L3, L4	Coffee – Sensorial Analysis – Vocabulary ISO TC 34/SC 15N 2113
4.03.01	**SENSORY QUALITIES IN COFFEE: TASTES AND BODY** In coffee basic tastes and aromas do not exist in isolation and they need to be recognised within the brewed coffee itself The body of the coffee describes the apparent viscosity, fullness and weight in the mouth ranging from "thin, watery" to "thick, heavy"	L3, L4	
4.03.02	Acknowledge that acidity, bitterness and body are origin and process dependent Triangle tests	L3, L4	
5.0 CUPPING SYSTEMS IN USE			
5.01.01	**DIFFERENT CUPPING SYSTEM** The SCAA cupping form, a standard Espresso Cupping System or brewing (filter, French press) objective is to adapt to the end product	L3, L4	
5.01.02	Explain there are a number of scoring cupping forms in use Distinguish between these forms and highlight differences in table set up for each form Identify differences in specific attributes of a cupping form in three different coffees	L3, L4	
5.02.01	**CORE CUPPING PROTOCOL; THE MEANING OF THE STANDARD PREPARATION VALUES** Mention, explain generally		
5.03.01	**COMMUNICATING THE RESULTS** Mention, explain generally		

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6.0 HOW TO SET UP SENSORY IN YOUR BUSINESS AND SENSORY APPLICATIONS – EQUIPMENT, MAINTENANCE AND STAFF			
6.01.01	**WHAT IS PANEL AND WHY SET UP A PANEL?** (Ref 1.0) - A group to a one person - Is a measurement instrument	L3, L4	
6.01.02	A group is better, more objective, not personal One is better than none	L3, L4	
6.02.01	**FACILITATING, TASTING AND PREPARATION AREA** Basics, mention standard		
6.03.01	**GOOD PRACTICES, EQUIPMENT AROUND TASTING AND SAMPLES, CLEANING, STORAGE** (Show lab pictures) • Booth • Table • Spittoon • Cups • Spoons • Water quality (treatment) • Temperature	L3, L4	
6.03.02	Explain that equipment can vary in modality (Example: turning table or not, sink spittoon or not). Identify the repeatability of testing and brew protocol as being the important point	L3, L4	
7.0 SET UP YOUR SENSORY PANEL			
7.01.01	**WHAT PANEL FOR WHAT TEST** Discriminative vs descriptive test Quantitative vs qualitative Robust vs informal	L3, L4	
7.01.02	Adapt your tests to your needs (objective, time, budget) in order to set up the right panel	L3, L4	
7.02.01	**SCREENING TASTERS** It is important that the panelists should have at least normal sensory sensitivity to any tests being carried out Avoid blind tasters in your panel Give awareness to potential tasters on sensory fundamentals and requirements This makes best use of time and investment, selecting accurate and motivated people	L3, L4	Meilgaard et al 2007 (Chapter 9)

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7.02.02	Distinguish between tasters and non-tasters Explain that people taste different, tasting relies on acuity not on hierarchy in company Explain that a ranking test is an effective way of screening possible panel members	L3, L4	Meilgaard et al 2007 (Chapter 9)
7.03.01	**TRAIN YOUR PANEL AND PANELLISTS** Long process: 6 months minimum Program example in content and time Ratio: nb tasters / taster expertise / scope From the In/Out panellist to the SCAA/COE jury	L3, L4	Standard ISO SCAA, COE training Depend on activity Be practical and adapted to the topic in content and time: - Defect - Green coffee - Roasting - Brewing
7.03.02	Recognise that developing an appropriate level of sensitivity in coffee and gaining knowledge takes time Improving calibration, recognition and broadening the range of sensory test protocols a cupper has knowledge of, is part of their learning journey	L3, L4	Standard ISO SCAA, COE training Depend on activity Be practical and adapted to the topic in content and time: - Defect - Green coffee - Roasting - Brewing
7.04.01	**CHECK PERFORMANCE AND CALIBRATION** Importance, mention, must have		
8.0 APPLICATION – ADVANTAGE AND LIMIT OF IN/OUT VS DESCRIPTIVE FOR QC, NPD – RELATION WITH ANALYTICAL			
8.01.01	**1. THE IN/OUT METHOD** (Illustrate practically) A simple method Good for routine Require standard and calibration on simple sensory dimensions Based on Reference sample Ideal for on-going production positive release An alternative test is the duo-trio	L3, L4	

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8.01.02	Describe the protocol of in/out Recognise this is a core methodology used in coffee roastery quality assurance, especially where there are small numbers of trained tasters Pass an in/out practical test	L3, L4	
8.02.01	**2. TRIANGLE TEST** (See before) For QC, NPD ex: Change of roasting profile, change of supplier, change of water, …		
8.02.02	Ease of application No training required Preparation method Need for number of tasters		
8.03.01	**3. GREEN COFFEE QUALITY CONTROL** (Mention that SCAA cupping can be this) Can be based on simplified SCAA analysis or simply an In/Out test Determining standards in green coffee is a primary quality marker for all subsequent quality checks Variables include defects, colour, smell, roast appearance Can be done for benchmark competition tasting (to be tackled in Professional)	L3, L4	
8.03.02	Explain that recording green coffee samples and their quality is the base point for all roastery quality management	L3, L4	

Key Terminology

Word or Term	Proposed Description	Source
Acidity	A basic taste characterised by the solution of an organic acid. A desirable sharp and pleasing taste … as opposed to an over-fermented sour taste	ICO, 1991
Aftertaste	The sensation produced by the lingering taste and aroma	Cappuccio, 2005
Aroma	The sensation of the gases released from brewed coffee, as they are inhaled through the nose through sniffing	Lingle, 2011
Astringent	An aftertaste sensation consistent with a dry feeling in the mouth, undesirable in coffee	ICO, 1991
Balance	A pleasing combination of two or more primary taste sensations	Lingle, 2011
Basic Tastes	The five basic tastes of sweet, sour, bitter, salty and umami	
Body	The physical properties of the beverage. A strong, but pleasant, full mouthfeel characteristic	ICO, 1991
Break	Aromatic assessment of the crust as it is broken three times	
Clean	Free from flavour taints or faults	Lingle, 2011
Crust	Aromatic assessment of the crust of wet coffee grounds that forms on the top of the brew surface immediately after brewing	
Cupping	A method used to systematically evaluate the aroma and taste characteristics of a sample of coffee beans	Lingle, 2011
Cupping Glasses/Bowls	All cups or glasses used should be of the same volume, dimensions and material of manufacture: **Cupping Glasses** 5 to 6 oz tempered glass **Porcelain bouillon bowls** of 175-225ml clean cups should be clean with no apparent fragrance and at room temperature	SCAA, 2009
Cupping Grind	Coarser than filter grind with 70% to 75% passing through a 850mμ sieve	SCAA, 2009
Cupping Roast	Sample roast targets: • Time: 8 – 12 minutes depending on roaster size • Colour: Agtron 60 – 65 (M-Basic)/Probat 105– 125 (colourette) • Coffees cupped 8 - 24 hours after roasting	SCAA, 2009
Dry	Assessment of the fragrance of the dry coffee grounds after grinding and prior to brewing	
Flavour	The sensation in mouth the coffee gives by the combination of Tastes and Aromas in the liquid phase	

Fragrance	The sensation of the gases released from roasted and ground coffee beans, as the aromatic compounds are inhaled through the nose by sniffing	Lingle, 2011
Gustation	“The detection of stimuli dissolved in water, oil, or saliva, by the taste buds”	Meilgaard et al, 2007
Mouthfeel	The tactile sense derived from physical sensations in the mouth during and after ingestion	Lingle, 2011
Olfaction	The sense of smell allowing the perception of aroma, fragrance, scents in gas / air using the nose	