



Cacao of Excellence Training and Certification Programme

Core Training in Sensory Evaluation

Prepared by

Andrew Meter

Research Specialist

Julien Simonis

Programme Manager

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Contents

Part A. The programme	2
About Cacao of Excellence	3
Training and Certification	4
The Core Training	5
The optional fifth day	6
Part B. Methodology and resources	7
Methodology and resources	8
Sensory evaluation form and web application	9
Samples and data used for training	10
Analysing the data	11
Selecting the samples	12
Part C. Schedule and Training modules	13
Day to day schedule	14
Training modules	15
Preparation in advance of training	16
Introduction to the CoEx methodology	17
Theoretical courses on cacao quality and flavour	18
Flavour identification	19
Flavour diversity	21
Blind evaluations	22
Blind tests	23
Part D Annexes	24
Annex I. Glossary of terms	25
Annex II. Calculation of total attribute scores	30

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PART A

The programme

Who we are, what the Core Training is, and how it leads to formal recognition as a CoEx Certified Taster.

About Cacao of Excellence

Led by the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), Cacao of Excellence is a global platform discovering, convening, promoting and rewarding cacao producers of excellence from all producing origins for superior cacao quality and flavour diversity.

The platform works across five strategic priorities: partnerships for quality and diversity at origin, data driven innovation, capacity building, safeguarding genetic diversity, and a global awards competition.

Since 2009, Cacao of Excellence has held nine global Award Editions, consolidated an extensive and globally diverse dataset on cacao production, assessed the flavour diversity and quality of over 1250 exceptional cacao bean samples from 55 origins, and led the development of the first International Standards for the Assessment of Cacao Quality and Flavour.

9

Award Editions
since 2009

1250+

Cacao samples
assessed

55

Producing
origins



3 SDG logos

This work contributes to Sustainable Development Goal 1 on poverty alleviation in cacao producing countries, SDG 9 on innovation in the cacao sector, and SDG 15 on preserving diversity in agricultural ecosystems.



Through this work, the Programme has developed practical tools that bring structure, consistency, and transparency to the evaluation of cacao quality and flavour.

The Programme advances global understanding of cacao quality through a rigorous, science-based, and standardised approach. Central to this is the Guide for the Evaluation of Cacao Quality and Flavour, launched on 25 September 2023. Developed with experts from over 60 cacao-producing countries, the Guide provides a universal reference for assessing cacao, from post-harvest processing to sensory evaluation, ensuring greater consistency, transparency, and fairness in how quality is recognised across the sector.

Before the publication of this Guide, the cacao industry lacked a shared methodology for evaluating flavour and processing practices. The Guide fills this gap by offering a clear, step-by-step framework for assessing cacao.

Training and Certification

Bringing trust, recognition, and consistency to cacao quality assessment

The Cacao of Excellence Training and Certification initiative represents the next step following the publication of the Guide for the Assessment of Cacao Quality and Flavour. While the Guide establishes a shared and scientifically grounded framework for assessing cacao quality, its impact depends on effective adoption and consistent application across the sector. The objective of the initiative is therefore to translate this common language into practice through structured training, while building a global community of professionals able to apply these standards in a reliable and aligned manner.

Beyond training, the initiative aims to ensure that the standards defined in the Guide become a practical and trusted instrument for value creation. By improving consistency in how cacao quality is evaluated and communicated, and by recognising individuals and institutions that demonstrate competency, it strengthens trust across the value chain and creates the conditions for quality to be more clearly recognised and rewarded.

PATHWAY TO CERTIFICATION IN SENSORY ANALYSIS OF CACAO

1

Core Training

4 to 5 days, in person. Methodology, theoretical courses, flavour identification across the full wheel, flavour diversity and blind evaluations.



CoEx Trained Taster

Certificate of completion. Issued by Cacao of Excellence, with inclusion in the official CoEx registry.

2

Personal development

Continued practice, online tasting sessions and complementary online modules to prepare for the certification's final examination.

3

Certification

4 days. Calibration sessions followed by a final examination of theory and practical sensory competency.



CoEx Certified Taster

Time bound, renewable. Formal recognition of professional proficiency, listed in the official CoEx registry.

The Core Training

Four days built around direct sensory experience with an optional fifth.

The CoEx Core Training is an intensive course designed to provide participants with a thorough understanding of the CoEx methodology and the common sensory language underpinning cacao quality assessment.

Rather than relying primarily on theoretical instruction, the training emphasises direct sensory experience. Participants work with carefully selected cacao mass samples that illustrate the range and diversity of attributes defined in the CoEx flavour wheel and glossary. Through guided tasting sessions, they learn to recognise, differentiate and describe flavour attributes with increasing precision, while progressively calibrating their perceptions against shared references.

4 to 5

Days

15

Participants

2

Trainers

65

Samples
tasted

Who the training is for

Producers and producer organisations. Cacao producers, and the people responsible for quality or post-harvest processing within a producer organisation. Sensory analysis gives them the tools to control and improve quality at origin, and the vocabulary to demonstrate that quality convincingly when they come to sell it.

Buyers, traders and sourcing teams. Monitoring the quality of the cacao they source, advising their suppliers on where and how it could be improved, and describing accurately to their own clients what they have bought.

Chocolate manufacturers and bean to bar makers. Owners, sourcing managers, and R&D or quality staff. Assessing incoming cacao, setting internal quality protocols that hold consistently across batches and seasons, giving suppliers precise and actionable feedback, and using all of it to sharpen the finished product.

Quality specialists, consultants and researchers. Sensory professionals who want their assessments anchored in an international standard, who want to work in the same language as everyone else trained to it, and who want formal recognition of their expertise.

What you leave with

- A solid foundation in the CoEx method, having tasted the full flavour wheel and applied it blind
- CoEx Trained Taster status and a Certificate of Completion
- Inclusion in the public CoEx registry
- A personal training kit and a printed copy of the Guide

The optional fifth day

Four days cover the full flavour wheel. A fifth can be added and shaped around the group.

The Core Training is delivered over four days as standard. Where the schedule and the group allow, a fifth day can be added. The four core days are unchanged, so the extra day is free to serve whatever will be most useful to the participants in front of us.

Three formats work well, and the choice is made with the host organisation when the training is planned.

Field day

A visit to a farm, a fermentation and drying facility, or both. Participants connect what they have been tasting to the decisions made at origin that produced it.



Laboratory processing day

Hands on work through the protocols in the Guide, from sampling and physical evaluation to roasting, grinding and preparing cacao mass for sensory evaluation. Particularly valuable for quality control teams who will run these steps themselves.



Tasting your own samples

Where the training is delivered to a single organisation, cooperative or origin, the fifth day can be spent evaluating the group's own cacao using the CoEx method, with feedback from the trainers. Either cacao beans or cacao mass samples can be sent, we can process beans and evaluate the samples in advance of the training.

PART

B

Methodology and resources

The Guide, the flavour wheel, the glossary and the Sensory Web App, and how training samples are chosen.

Methodology and resources

Cacao of Excellence methodology is based on the Guide for the Assessment of Cacao Quality and Flavour, available in English, French, Spanish and Italian. The protocols it sets out were developed with the CoEx Technical Committee and have been implemented, tested and improved by leading sensory evaluation experts across past Editions of the Awards.

To ensure comparability of results it is essential to have a common vocabulary and a set of tools that guide the evaluation and recording process. Three are used throughout the training.

Glossary of terms

Flavour attributes and sub attributes with their definitions, each assessed on a 0 to 10 intensity scale with reference examples for each level. See Annex I.

Flavour wheel

A single visual reference organising every attribute in the glossary alongside its sub attributes, used to guide assessors and establish a sample's profile.

Sensory web application

Participants evaluate simultaneously and compare results in real time. Totals are calculated automatically using the declining series formula. See Annex II.



Core attributes

Expected in every sample and always scored. Cacao, acidity, bitterness, astringency and roast degree.

Complementary attributes

May or may not be perceived. Fresh and browned fruit, vegetal, floral, woody, spice, nutty and caramel or panela.

Off flavours

May or may not be perceived, and result from defects.

Sensory evaluation form and web application

Sensory data can be recorded in several formats, including the Cacao of Excellence Excel Sensory Evaluation Form. In addition, a web based application is under development and is being tested during official CoEx training sessions.

The application lets participants evaluate samples simultaneously and visualise and compare results in real time, allowing immediate feedback and discussion during the training. Attributes and sub attributes are both recorded, and total attribute scores are calculated automatically using the declining series formula detailed in Annex II.

Sample 1 Acidity locked Cacao mass Chocolate Full profile Checked subs End evaluation

ATTRIBUTES
12 of 16 scored

- CACAO 5
- ACIDITY 3
- BITTERNESS 3
- ASTRINGENCY 2
- ROAST* 4
- FRESH FRUIT 3.08
- BROWNE FRUIT 1.75
- VEGETAL 1
- FLORAL 3
- WOODY 0
- SPICE 1
- NUTTY 2
- PANELA 0
- SWEETNESS NA
- OFF FLAVOURS 0
- GLOBAL QUALITY 8

CORE

CACAO 5

ACIDITY 3

Fruit 3 Acetic 0

Lactic 0 Mineral / Butyric 0

BITTERNESS 3

ASTRINGENCY 2

ROAST* 4

COMPLEMENTARY

FRESH FRUIT 3.08

Berry 2 Citrus 0

Dark 1 Yellow / Orange / White flesh 0

Tropical 1

BROWNE FRUIT 1.75

Dried 1 Brown 1

Overripe 0

VEGETAL 1

Grassy / Green vegetal / Herbal 1 Earthy / Mushroom / Moss / Woodsy 0

FLORAL 3

Orange blossom 0 Flowers 3

RESOURCES

- Flavour Wheel**
The CoEx flavour wheel
- Glossary of Terms**
Every attribute, with intensity references
- Global Quality**
How to score Global Quality
- Score Calculation**
How attribute totals are calculated
- Keyboard Shortcuts**
Score the whole sheet without the mouse

DATA VISUALISATION
Polar graph | Heatmap

COMMENTS

Cacao of Excellence Sensory Web Application, evaluation view with live polar graph

Samples and data used for training

Exceptional cacao from across the producing world, and the sensory data that lets us understand it.

Training samples are drawn from the 2025 and 2023 Editions of the Cacao of Excellence Awards.

Exceptional samples, unequalled diversity

Every sample entering the pool has already been selected at origin as among the best a producing country has to offer. The 2025 Edition alone brought 191 samples from 45 producing origins across all four major cacao producing regions. Each was processed into cacao mass under the protocols of the Guide, within the CoEx Cacao R&D Laboratory in Perugia, Italy.

High quality sensory data, rigorously analysed

Every sample is evaluated by the CoEx Technical Committee, comprising leading sensory evaluation experts. That produces a dense, consistent dataset which we analyse to understand how flavour profiles differ from one another, and to select training samples on evidence rather than intuition. The worked example that follows uses the 2025 data. The same method is applied to the 2023 samples.

THE 2025 POOL, STEP BY STEP

191

Submitted

2025 Edition, 45 producing origins, four cacao regions

50

Award winners removed

The top 50 samples are withdrawn from the training pool

106

Training pool

Filtered to a Global Quality score above 7

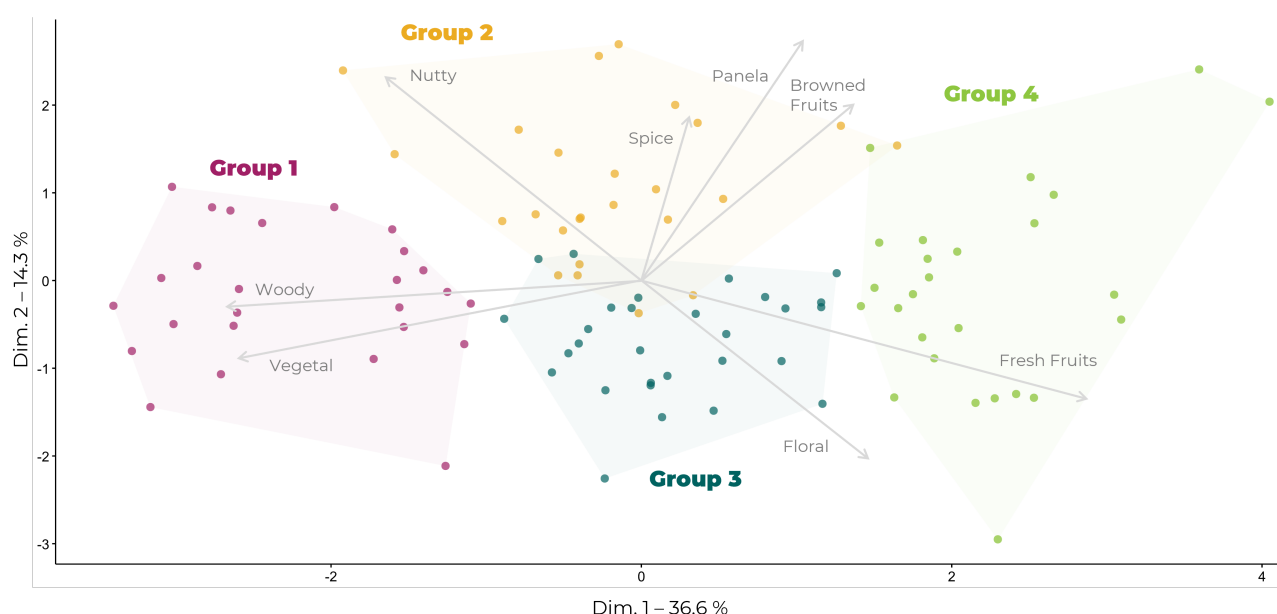
Samples tasted during a given training are a selection from this pool, alongside samples from the 2023 Edition prepared the same way. For every sample that ends up in a training kit, a short list of candidates is re evaluated by the Cacao of Excellence team and its Technical Committee to confirm suitability. The analysis narrows the field. The panel makes the final call.



Analysing the data

Uncovering the diversity of flavours within the training pool

Flavour intensities were rated from 0 to 10 according to the CoEx flavour wheel, alongside a Global Quality score. Differences in how panelists use the scoring scale were corrected using a mixed effects model estimated through Restricted Maximum Likelihood. Outliers were removed using the Median Absolute Deviation method at a rejection criterion of 2 MAD units, and attribute means estimated using mixed effects models correcting for panelist effects. Scores were then standardised, and Principal Component Analysis and k means clustering performed in R.



Cacao samples grouped by k means clusters, each shown as a coloured polygon. Attribute vectors indicate the direction and magnitude of their influence on the principal components.

Group 1

Higher vegetal and woody, relatively high bitterness and astringency.

Group 2

Stronger nutty, brown fruit and spice notes.

Group 3

Moderate intensities across a range of attributes.

Group 4

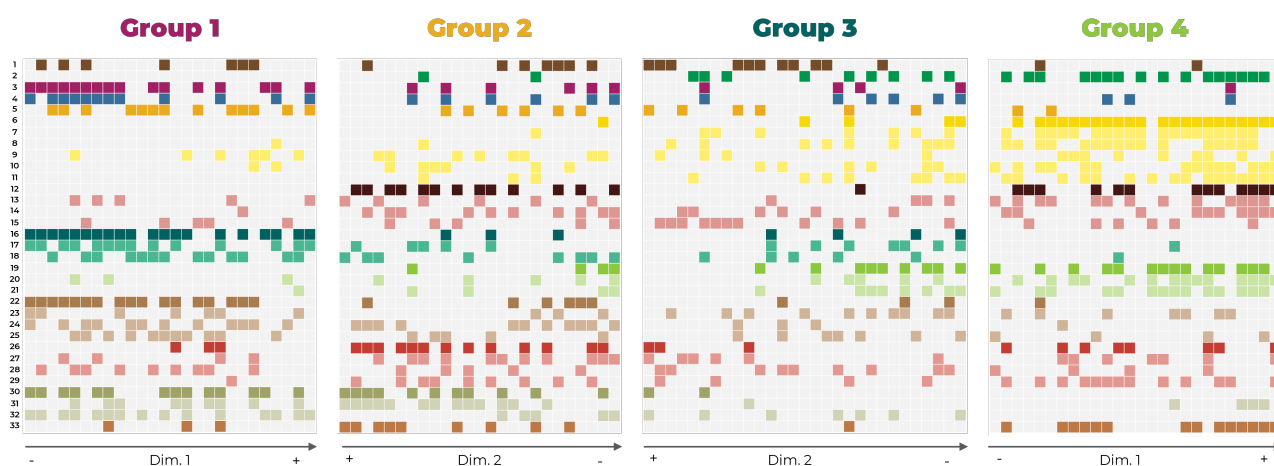
Higher fresh fruit and floral notes, with overall higher acidity.

These four groups are not a general classification of cacao flavour. They are the structure found within this pool, and a different Edition would produce a different picture. That this structure emerges at all confirms the diversity of flavour profiles across the samples, since a homogeneous pool would show none. This diversity across cacao samples, together with the quality of the sensory evaluation data, is what makes a data-driven approach to selecting training samples possible.

Selecting the samples

How a large, diverse pool becomes the specific set of samples in front of you.

Samples in the training pool differ from one another in identifiable ways. That structure is what makes deliberate selection possible: samples for flavour identification are chosen for their high intensity of one attribute, samples for flavour diversity for the contrast of their overall profile.



Each column of this heat map represents a cacao sample, and each row corresponds to a flavour attribute (see flavour wheel for colour-attribute mapping). Filled squares indicate flavour intensity scores above 75% of all samples, highlighting key flavour traits. Samples are grouped by k-means clustering and ordered within groups by ascending/descending values of the first/ second principal component of the PCA.

Selecting flavour identification samples

The objective is a sample that clearly illustrates one attribute. Samples showing high intensity for that attribute are identified in the dataset, and a Pareto based approach finds candidates combining strong expression of the target with moderate overall complexity, so the flavour is not masked by everything else in the cup.

Selecting Diversity Kit samples

Here the objective is contrast rather than clarity. Samples are drawn from the cluster structure, two from each group, and the selection also maximises origin diversity, with two samples from distinct origins in each of the four cacao producing regions.



PART

C

Training modules

Seven complementary modules that together build individual sensory skill and alignment with the shared CoEx language.

Day to day schedule

Tentative schedule, subject to change. Session content is described in Part D.

Before the training: sign up to the CoEx Sensory Web App and complete one evaluation

Total samples tasted - **70**

Day 1 13 samples	Day 2 19 samples	Day 3 22 samples	Day 4 16 samples
9:00 to 9:30 Introduction to the Cacao of Excellence Programme	9:00 to 9:45 Blind evaluations, session I (2)	9:00 to 9:45 Blind evaluations, session III (2)	9:00 to 9:45 Blind evaluations, session V (2)
9:30 to 10:30 Theoretical course Sensory science CoEx Methodology	9:45 to 10:30 Theoretical course Flavour formation in cacao	9:45 to 10:30 Theoretical course Cacao processing in a laboratory setting	9:45 to 11:00 Flavour diversity 4 samples with distinct profiles (4)
10:30 to 12:00 Flavour identification Core attributes. Cacao, acidity, bitterness, astringency (5)	10:30 to 12:00 Flavour identification, sub attributes I Fresh fruit (5), nutty (2)	10:30 to 12:00 Flavour identification, sub attributes III Browned fruit (3), floral (2), woody (3)	11:00 to 12:00 Flavour diversity, blind test Grouping 4 samples by profile (4)
LUNCH BREAK			
13:30 to 14:15 Theoretical course Origins & genetics of cacao	13:30 to 14:15 Blind evaluations, session II (2)	13:30 to 14:15 Blind evaluations, session IV (2)	16:15 to 17:00 Theoretical course Panel tastings and data analysis
14:30 to 16:30 Flavour identification Complementary attributes. Fresh fruit, browned fruit, vegetal, floral, spice, woody, nutty, panela (8)	14:30 to 16:00 Flavour identification, sub attributes II Vegetal (2), spice (3)	14:30 to 16:00 Flavour comparison Complementary attributes, blind test by pairs or triplets (7)	14:30 to 16:00 Final blind test 1 core attribute, 3 complementary sub attributes, 1 off flavour (6)
16:30 to 17:00 Wrap up and Q&A	16:15 to 17:00 Flavour identification, off flavours (3)	16:15 to 17:00 Flavour identification, off flavours (3)	16:00 to 17:30 Final wrap up Mini game results, training kits, final Q&A
	17:00 to 17:30 Wrap up and Q&A	17:00 to 17:30 Wrap up and Q&A	

Sample counts per session are indicative and may be adjusted by the trainers in response to the pace of the cohort, the samples available and local conditions.

Training modules

The Core Training is structured into a series of complementary modules that together provide a progressive and comprehensive learning experience. The programme combines preparatory steps prior to the training, an introduction to the CoEx methodology and tools, theoretical courses, and a sequence of practical sensory sessions designed to build the ability to identify, describe and evaluate cacao flavour.

Each module contributes to developing both individual sensory skills and alignment with the shared CoEx language.

1

Preparation in advance of training

Sign up to the CoEx Sensory Web App and test it with any sample

2

Introduction to the CoEx methodology

Discover and implement our methodology and tools

3

Theoretical courses on cacao quality and flavour

The science behind cacao flavour, and how samples are prepared

4

Flavour identification

Identify and understand flavour attributes in cacao samples

5

Flavour diversity

Explore diverse cacao flavour profiles from around the world

6

Blind evaluations

Apply the CoEx methodology in real evaluation conditions

7

Blind tests

Validate your learning by identifying samples under blind conditions

Preparation in advance of training

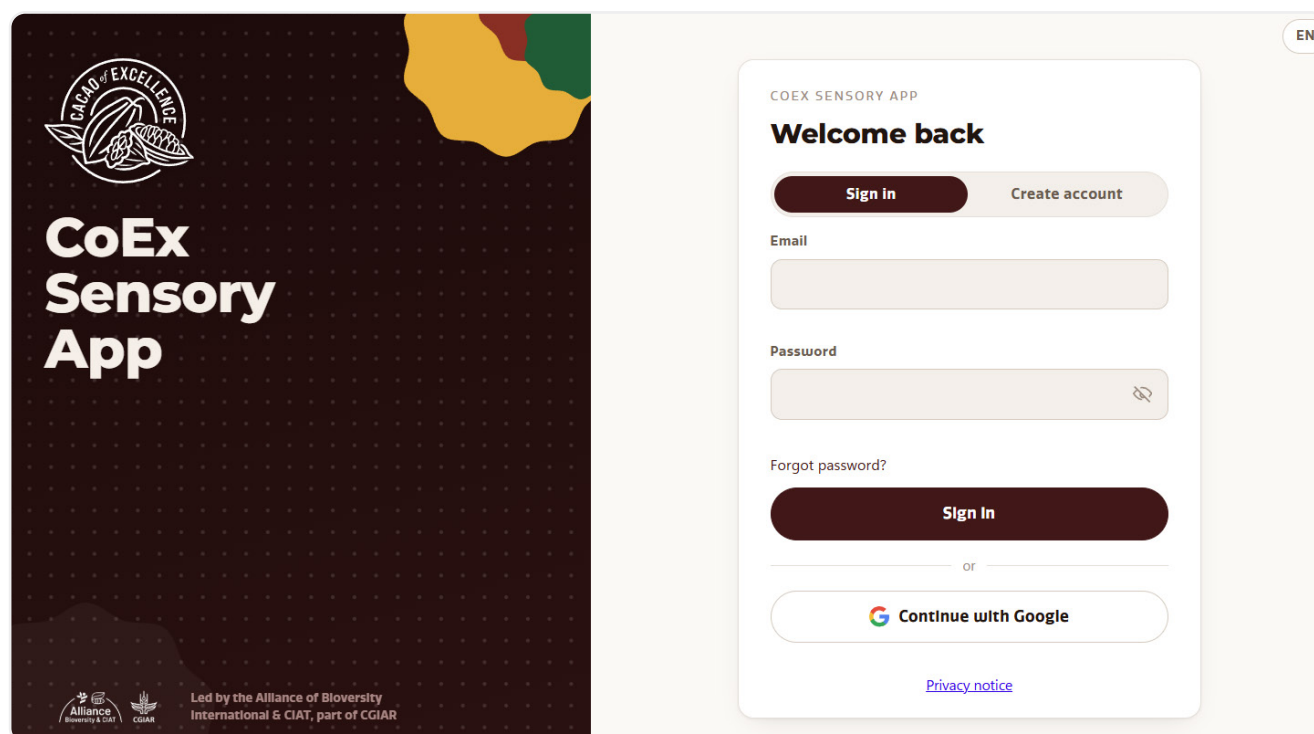
Sign up to the CoEx Sensory Web App and test it with any sample

Prior to the training, participants are required to create an account on the CoEx Sensory Web App and complete an evaluation using any cacao or chocolate sample available to them.

This preparatory step familiarises participants with the digital tool used throughout the training, including navigating the flavour wheel and glossary and completing the evaluation process. By engaging with the application in advance, participants can ensure they are comfortable with the interface and avoid technical issues during the training, allowing sessions to focus fully on sensory development and practical exercises.

Before you arrive

Create your account. Complete one full evaluation with any cacao or chocolate sample. Browse the flavour wheel and glossary inside the app. Report any technical issue to the CoEx team.

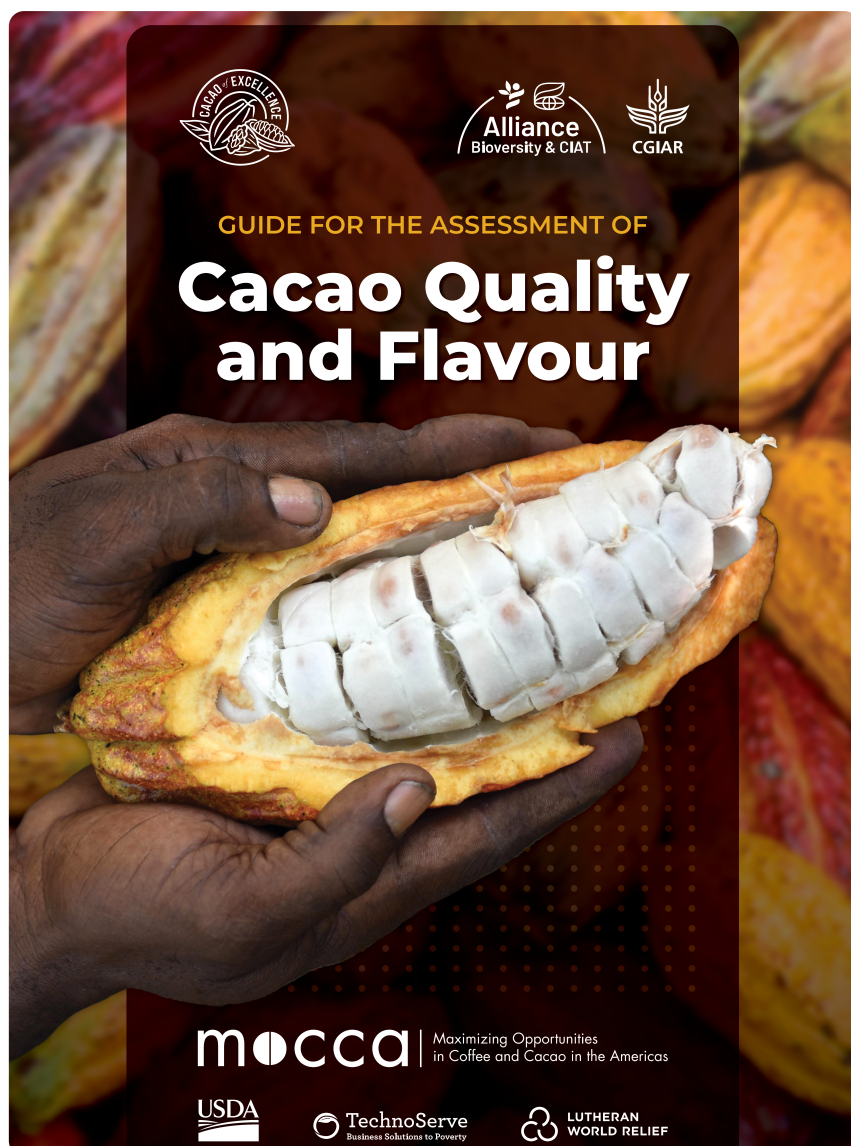


Introduction to the CoEx methodology

Discover and implement our methodology and tools

This session introduces participants to the Cacao of Excellence methodology and the key resources that support it: the flavour wheel, the glossary of terms, and the Guide for the Assessment of Cacao Quality and Flavour.

It provides a structured overview of how cacao quality and flavour are defined and evaluated within the CoEx framework, while introducing essential concepts in sensory evaluation. The objective is to ensure that all participants develop a clear understanding of the methodology, the common language used throughout the training, and how these tools are applied in practice during subsequent sessions.



Theoretical courses on cacao quality and flavour

The science behind cacao flavour, and how samples are prepared

These sessions provide the scientific and technical foundations needed to understand how cacao quality and flavour are formed, how samples are produced, and how both are evaluated. By linking underlying mechanisms to the attributes explored during tastings, they help participants interpret what they perceive.

Three courses run across the programme.

Sensory science

How perception works, where it misleads, and what that means for scoring. Delivered on Day 1, before the first tasting.

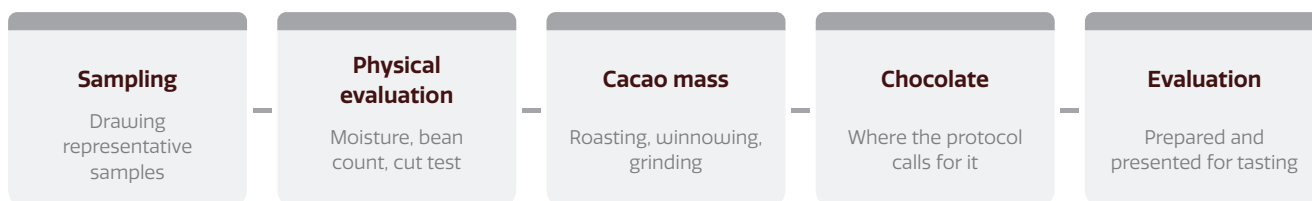
Flavour formation in cacao

Genetics, environment and post harvest processes such as fermentation and drying, and how each shapes the profile in the cup.

Cacao processing in a laboratory setting

The protocols that stand between a lot of beans at origin and a cup of cacao mass on the tasting bench, following the protocols of the Guide.

FROM BEAN TO EVALUATION



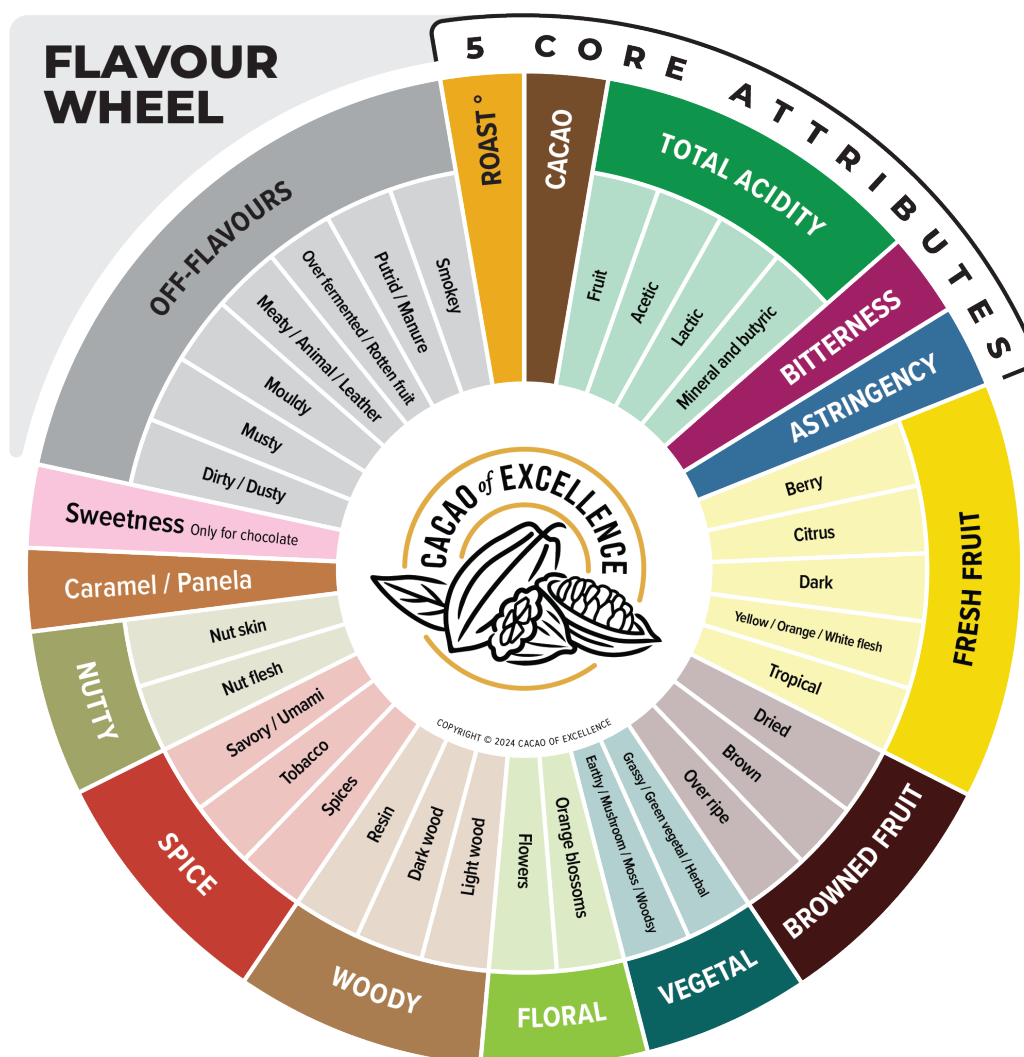
Flavour identification

Identify and understand flavour attributes in cacao samples

1/2

Flavour identification sessions constitute the core of the training programme. Their primary objective is to guide participants through the full range of attributes defined in the CoEx flavour wheel and to build a shared sensory language through direct experience.

Through a series of structured tastings, participants work with cacao mass samples selected to clearly express specific flavour attributes, allowing them to progressively explore, differentiate and understand the vocabulary used to describe cacao flavour. The module works outward through the wheel, beginning with the core attributes present in every sample, then the complementary attributes, then their sub attributes, and finally the off flavours.



Flavour identification

Identify and understand flavour attributes in cacao samples

What is bitterness in cacao ? How does fresh fruit differ from browned fruit? What distinguishes fruit acidity from acetic acidity, or dark wood from light wood? Each session focuses on such distinctions, enabling participants to anchor these concepts in real sensory experiences. Individual tastings are followed by group discussions to align perceptions and interpretations, reinforcing consistency across the panel.

Samples are selected for the clearest available expression of their targeted attribute. Some complexity remains in every sample, as these are cacao mass, not chemical standards, and the target attribute sits within a fuller profile rather than in isolation. Navigating this complexity is part of what participants are expected to learn.

Through repetition and comparison, participants progressively anchor their understanding of cacao flavours in reference to actual samples, forming the basis for all subsequent evaluation work.

IDENTIFICATION SESSIONS ACROSS THE FOUR DAYS

Day 1	Core attributes Cacao, acidity, bitterness, astringency, roast degree	5
Day 1	Complementary attributes Fresh fruit, browned fruit, vegetal, floral, spice, woody, nutty, panela	8
Day 2	Sub attributes I Fresh fruit (5), nutty (2)	7
Day 2	Sub attributes II Vegetal (2), spice (3)	5
Day 2	Off flavours I Selected defect references	2
Day 3	Sub attributes III Browned fruit (3), floral (2), woody (3)	8
Day 3	Off flavours II Selected defect references	2
Day 4	Final blind test 1 core attribute, 3 complementary sub attributes, 1 off flavour	3

Flavour diversity

Explore diverse cacao flavour profiles from around the world

Flavour diversity tasting sessions adopt a flavour profile approach rather than focusing on specific flavour attributes. The objective is to practice identifying different flavours within samples in which multiple core and complementary attributes stand out, and to appreciate their overall flavour profiles.

Samples are selected based on the diversity of their profiles, along with other criteria such as origin, complexity or uniqueness. These sessions further align participants on the identification of attributes within more challenging samples, requiring them to navigate the complexity of overlapping attributes and sub attributes, and allow a wide diversity of profiles to be compared within a single tasting session.

What makes these sessions different

Whole profile assessment rather than single attribute focus. Samples drawn from all four clusters identified in the data, and from two origins in each of the four cacao producing regions. Overlapping attributes and higher complexity throughout.



Blind evaluations

Apply the CoEx methodology in real evaluation conditions

Blind evaluation sessions run throughout the training, allowing participants to apply and reinforce the skills developed during flavour identification exercises. Participants evaluate cacao mass samples they have previously encountered, but presented under blind conditions with new sample codes and without any indication of the targeted attributes.

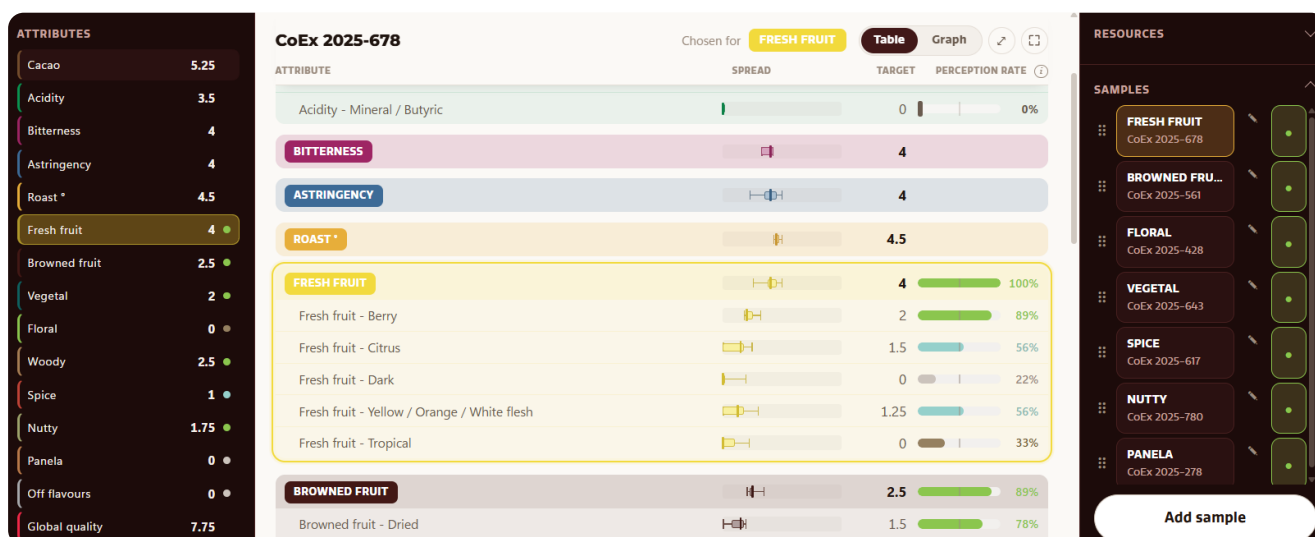
Each participant independently assesses the sample using the CoEx Sensory Web App, completing a full flavour profile in real time. Once evaluations are submitted, results are immediately compiled and reviewed collectively. The group first examines overall panel averages across attributes, followed by a more detailed analysis of individual results.

How a session runs

A full flavour profile, scored independently and in real time, under new sample codes with no indication of the target attributes. Panel averages are reviewed first, then the individual spread.

Anonymous results

Individual data stays anonymous to the group, while each participant can find their own results through a personal code in the application. The set up session takes place on the afternoon of Day 1, so the first scored session can open on the morning of Day 2.



Blind tests

Validate your learning by identifying samples under blind conditions

Blind tests are short, practical assessments that allow participants to actively validate their learning by identifying and categorising samples under blind conditions. Unlike blind evaluations, which focus on building full sensory profiles, these exercises require participants to compare samples and assign them to specific attributes or groups based on their sensory characteristics.

These exercises are conducted collectively, with results reviewed and discussed as a group, providing immediate feedback and reinforcing the ability to recognise, differentiate and correctly classify cacao flavour attributes.

Flavour comparison

Pairs or triplets of samples representing potentially confusable attributes, assigned to the correct attribute through an online quiz. Fresh fruit against floral and vegetal, or nutty against spice.

Diversity based grouping

Samples from the Diversity Kit assigned to broader profile categories through comparative tasting, such as high acidity with fruit and floral against bitterness with vegetal and woody.

Final comprehensive test

On the last day, core attributes, complementary attributes and off flavours combined, applying knowledge across the full spectrum of the flavour wheel.

PART

D

Annexes

The glossary of terms and the calculation of total attribute scores, reproduced from the Guide for the Assessment of Cacao Quality and Flavour.

Annex I. Glossary of terms

Attribute intensity scale and meanings:

Intensity Meaning

0	Absent.
1	Just a trace and may not be found if tasted again.
2	Present in the sample but at low intensity.
3 to 5	Clearly characterising the sample.
6 to 8	Dominant characterisation of the sample.
9 to 10	Maximum. Strong intensity. Overpowers some other flavour notes in the sample.

The flavour attributes are divided into three groups:

- 1. Core attributes:** cacao, acidity, bitterness, astringency and roast degree expected to be present in every sample and scored.
- 2. Complementary attributes:** characteristics that may or may not be perceived in cacao samples.
- 3. Off-flavours:** resulting from defects that may or may not be perceived in cacao samples.

Descriptor	Description	Intensity level / Reference notes	
Cacao	Typical flavour of roasted cacao beans that are well fermented, dried, free of defects.	0–2	Under-fermented cacao, ancient Criollos.
		3–5	Appropriately fermented “Nacional” and Papua New Guinean lots.
		6–8	Appropriately fermented cacao, some West African and some Dominican Republic Hispaniolan lots.
		9–10	Some West African lots.
Acidity	<p>Total acidity is the sum of the following individual acidities. If the result is ≥ 10 it is rounded to 10 as the maximum:</p> <ul style="list-style-type: none"> • Fruit: citric or other fruit acids. • Acetic: vinegar (can be smelled in the sample). • Lactic: typically occurring in sour milk and yogurt • Mineral and butyric: harsh metallic tasting (mineral) and rancid butter (butyric). <p>Perception of acidity intensity is particularly dependent on the amount of sample in the mouth.</p>	0–2	Some well-prepared West African lots.
		3–5	Some Ecuadorian, Peruvian and Central American lots.
		6–8	Some Dominican Republic Hispaniola, Papua New Guinean and Malaysian lots.
Bitterness	<p>Basic taste, typically perceived in caffeine, coffee, kola nut, some beers and grapefruit.</p> <p>Perception of bitterness intensity is particularly dependent on the amount of sample in the mouth.</p>	1–2	Some ancient Criollos.
		3–5	Well-prepared West African lots.
		6–8	Severely under- and un-fermented cacao.

Descriptor	Description	Intensity level / Reference notes	
Astringency	<p>Astringency could be perceived in two ways:</p> <ul style="list-style-type: none"> • Sharp mouth-drying effect, sharp, perceived between tongue and palate and /or at the back of the front teeth and inside lips and gums – typical of raw nut skins and green banana skins. • Velvety sensation on the sides of mouth and tongue. Typical of tannins in some wines or beers. <p>Perception of astringency intensity is particularly dependent on the amount of sample in the mouth.</p>	I N T E N S I T Y	<p>1–2 Some ancient Criollos.</p> <p>3–5 Normal intensity for most cacao.</p> <p>6–8 -</p> <p>9–10 -</p>
		T Y P E	<p>Sharp-mouth drying Typical of under-fermented cacao.</p> <p>Velvety Typical of appropriately fermented “Nacional”.</p>
Fresh fruit	<p>Total fresh fruit is composed of the following sub-attributes:</p> <ul style="list-style-type: none"> • Berry: red or black currant, strawberry, raspberry, blackberry, acai berry. • Citrus: orange, lemon, lime, grapefruit or generic sensation of citrus-like fruit. • Dark: cherry, plum. • Yellow / orange / white flesh: apricot, peach, pear, banana. • Tropical: passion fruit, pineapple, mango or soursop. 	0–2	Many West African lots.
		3–5	Some Central and South American, well fermented Asia and Pacific country lots.
Browned fruit	<p>Total browned fruit is composed of the following sub-attributes:</p> <ul style="list-style-type: none"> • Dried: dried apricot, banana, yellow raisin, fig that has undergone an un sulphured drying process. • Browned: dark raisin, dates, prunes. • Over ripe: No longer fresh and severely over-ripe fruit, turning brown inside and outside, as a step towards over-fermentation. 	6–7	Madagascar, some Central and South American country lots, some Papua New Guinean lots.
		0–2	Many West African lots.
Vegetal	<p>Total vegetal is composed of the following sub-attributes:</p> <ul style="list-style-type: none"> • Grassy / Green vegetal / herbal: <ul style="list-style-type: none"> » Grassy – freshly cut grass, young green leaves. » Green vegetal – crushed mature leaves. » Herbal – hay, straw or herbal / dried green, herbs like thyme and rosemary. • Earthy / mushroom / moss / woody: <ul style="list-style-type: none"> » Earthy – smell of dampness rising from soil after rain. » Mushroom – smell of fresh mushrooms. » Moss – damp moss often associated with earthiness. » Woody – leaves and wood on a forest floor. 	3–5	Fully fermented Indonesian and some Caribbean country lots.
		6–8	Some Papua New Guinean and some Caribbean country lots.
Vegetal	<p>Total vegetal is composed of the following sub-attributes:</p> <ul style="list-style-type: none"> • Grassy / Green vegetal / herbal: <ul style="list-style-type: none"> » Grassy – freshly cut grass, young green leaves. » Green vegetal – crushed mature leaves. » Herbal – hay, straw or herbal / dried green, herbs like thyme and rosemary. • Earthy / mushroom / moss / woody: <ul style="list-style-type: none"> » Earthy – smell of dampness rising from soil after rain. » Mushroom – smell of fresh mushrooms. » Moss – damp moss often associated with earthiness. » Woody – leaves and wood on a forest floor. 	0–2	West African lots.
		3–5	Appropriately fermented “Nacional” and some Caribbean country lots.
Vegetal	<p>Total vegetal is composed of the following sub-attributes:</p> <ul style="list-style-type: none"> • Grassy / Green vegetal / herbal: <ul style="list-style-type: none"> » Grassy – freshly cut grass, young green leaves. » Green vegetal – crushed mature leaves. » Herbal – hay, straw or herbal / dried green, herbs like thyme and rosemary. • Earthy / mushroom / moss / woody: <ul style="list-style-type: none"> » Earthy – smell of dampness rising from soil after rain. » Mushroom – smell of fresh mushrooms. » Moss – damp moss often associated with earthiness. » Woody – leaves and wood on a forest floor. 	6–8	Some Caribbean country lots and some Peruvian lots.

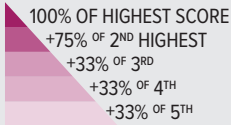
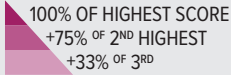
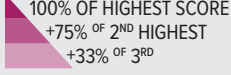
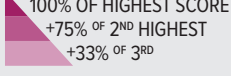
Descriptor	Description	Intensity level / Reference notes	
Floral	Total floral is composed of the following: <ul style="list-style-type: none"> • Orange blossom: orange blossom flavour. • Flowers: jasmine, honeysuckle, rose, lilac, lilies, etc. 	0–2	West African lots.
		3–5	Appropriately fermented “Nacional” and some Caribbean country lots.
		6–8	Some Caribbean country lots and some Peruvian lots.
Woody	Total woody is composed of the following sub-attributes: <ul style="list-style-type: none"> • Light wood: freshly cut cacao wood, white pine wood, maple wood, ice-cream/popsicle wooden stick. • Dark wood: oak, walnut, teak, mahogany. • Resin: pitch of pine or other resinous wood. 	0–2	-
		3–5	Some “Nacional” and many West African lots.
Spice	Total spice is composed of the following sub-attributes: <ul style="list-style-type: none"> • Spices: dried coconut, nutmeg, cinnamon, cloves, cacao mass, tonka, vanilla, black pepper. • Tobacco: dried tobacco leaves. • Savoury/Umami: sodium glutamate, umami. 	0–2	In most origins.
		3–5	In some West African, Central and South American and Caribbean country lots.
Nutty	Total nutty is composed of the following sub-attributes: <ul style="list-style-type: none"> • Nutty – nut flesh: the edible kernel of a light roasted nut – hazelnut, macadamia, pecan, walnut, cashew, almond, Brazil nut. • Nutty – nut skins: the flavour of lightly roasted nut skins – hazelnut, macadamia, pecan, walnut, cashew, almond, Brazil nut. 	0–2	In most origins.
		3–5	Some Central and South American and Caribbean countries’ lots and ancient Criollos.
Caramel / Panela	Aromas reminiscent of caramel, brown sugar and panela (unrefined cane sugar)	0–2	In most origins
		3–5	Some Central and South American and Caribbean countries’ lots and ancient Criollos
Sweetness (only for chocolate)	Basic taste of white sugar solutions, typically perceived in foods like candies and desserts that contain sugar (or other sweeteners such as aspartame) and also naturally found in other foods like fruits.		

Descriptor	Description	Intensity level / Reference notes
Roast degree	A measure of the extent of the roasting the beans. Significant under or over roasting alters many of the attribute values.	2–3: Low roast 4–6: Medium roast 7: High roast 8–10: Levels of burnt/over-roasted
Off-flavours	<p>Total Off-Flavours is the sum of any unpleasant characters from the following. If the result is ≥ 10 it is rounded to 10 as the maximum:</p> <ul style="list-style-type: none"> • Dirty/dusty: not related to texture but to an off-flavour. • Musty: stale, damp, mildew, decaying. • Mouldy: characteristic of mould growth. • Meaty/animal/leather: <ul style="list-style-type: none"> » Meaty – cured meat, ham, rendered fat. » Animal – dirty animal / farmyard. » Leather – used old leather. • Over-fermented/rotten fruit: decomposing fruit. • Putrid/manure: <ul style="list-style-type: none"> » Putrid – wet decomposing vegetative matter. » Manure – farmyard animal manure. • Smoky: contamination from the smoke (any kind). • Other off-flavours: rancid, diesel, oil fumes, petroleum, tar, paint, tyres, chemicals, burnt, etc. 	0: Absent – clean, well fermented, dried and stored cacao beans. 1–2: Low intensity. 3+: Clearly characterizing the sample as a defect.
Global Quality	<p>The Global Quality score reflects the overall impression of the:</p> <ul style="list-style-type: none"> • expressed flavour potential • uniqueness of the sample • balance of flavour and cleanliness of the finish <p>It celebrates the expression of genetics and terroir diversity through the farmer's knowhow.</p>	Global Quality scores and meaning below

Meaning of the global quality scores for the sensory evaluation of cacao beans processed into mass and chocolate (Cacao of Excellence 2023).

	Off-flavours	Core attributes	Complementary attributes	Notes
0	Serious off-flavours clearly characterizing the sample as defective	Masked by off-flavours	Masked by off-flavours	Be as specific as possible on the type of off-flavours as this is valuable feedback to the producers
1				
2				Depending on the type, number and intensity of off-flavours, 0 would be the worst case and 3 the least but still bad
3				
4	In low intensity	Seriously unbalanced	Masked by off-flavours and unbalanced core attributes	
5	In low intensity	Unbalanced	Partially masked by unbalanced core attributes	
6	In low intensity or absent	Unbalanced	In low intensity, none outstanding, not in balance to core attributes	Overall plain flavour – mainly characterized by the core attributes and less by the complementary attributes
7	Absence of any	Balanced	One or more are outstanding but not in balance to core attributes	Overall plain flavour – mainly characterized by the core attributes and less by the complementary attributes
8	Absence of any	Well balanced with moderate base cacao flavour	One or more are outstanding, in balance to core attributes and to each other	Overall flavour presents some complexity
9	Absence of any	Well balanced, good base cacao flavour	Many outstanding, in balance to core attributes and to each other	Overall flavour presents a combination of complexity, uniqueness, harmony, brightness, clean finish
10	Absence of any	Well balanced, in low to moderate intensity, good base cacao flavour	Clearly recognizable, many outstanding, in balance to core attributes and to each other	Overall flavour presents a combination of complexity, uniqueness, harmony, brightness, clean finish The sample is of extraordinary quality, rarely seen

Annex II. Calculation of total attribute scores

SCORE (0-10)		Core attributes
	_____	CACAO
	_____	ROAST DEGREE
	_____	BITTERNESS
	_____	ASTRINGENCY
TOTAL OF ALL SUB-ATTRIBUTES IF THE RESULT IS >10 IT IS ROUNDED TO 10 AS THE MAXIMUM		TOTAL ACIDITY Fruit Acetic Lactic Mineral and Butyric
CALCULATED FIELD: 		Complementary attributes TOTAL FRESH FRUIT Berry Citrus Dark Yellow / Orange / White flesh Tropical
CALCULATED FIELD: 		TOTAL BROWNED FRUIT Dried Brown Over ripe
CALCULATED FIELD: 		TOTAL VEGETAL Grassy/green vegetal/herbal Earthy/mushroom – moss / woodsy
CALCULATED FIELD: 		TOTAL FLORAL Orange blossom Flowers
CALCULATED FIELD: 		TOTAL WOODY Light wood Dark wood Resin
CALCULATED FIELD: 		TOTAL SPICE Spices Tobacco (dried tobacco leaves) Savoury/umami
CALCULATED FIELD: 		TOTAL NUTTY Nut flesh Nut skins
		CARAMEL / PANELA SWEETNESS (Only for chocolate)
TOTAL OF ALL SUB-ATTRIBUTES IF THE RESULT IS >10 IT IS ROUNDED TO 10 AS THE MAXIMUM		Total off-flavours Dirty/dusty Musty Mouldy Meaty/animal/leather Over fermented/rotten fruit Putrid/manure Smoky Other off-flavour description
		Global Quality Comments on flavour



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Cacao of Excellence is led by the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), part of CGIAR.

