Meeting of the Working Group on the Development of International Standards for the Assessment of Cocoa Quality and Flavour
Paris, France, 31 October – 2 November 2018

REPORT
Organizations and funding for the meeting:

In-kind contributions from participating organizations:
Table of Contents

Acronyms................................................................................................................................. 2
Executive Summary...................................................................................................................... 3
1. Introduction ............................................................................................................................. 5
  1.1. Background ........................................................................................................................ 5
  1.2. Meeting of the Working Group on the Development of International Standards............... 6
  1.3. Review of process since November 2017 ......................................................................... 7
  1.4. Updates from participants ............................................................................................... 10
2. In-depth review of the ISCQF draft protocols .................................................................... 12
  2.1. Methodology .................................................................................................................... 12
  2.2. Summary of feedback on the specific protocols reviewed ............................................... 14
3. Discussion on strategic issues and coordination of the WG ............................................... 16
4. Conclusions, Research and Next Steps ................................................................................. 17
Annex A – Members of the Working Group on the International Standards for the Assessment of
Cocoa Quality & Flavour .............................................................................................................. 19
Annex B – Programme of the WG on ISCQF meeting – Paris 2018 ......................................... 20
Annex C - List of participants .................................................................................................. 21

Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AMACACAO</td>
<td>Asociación Mesoamericana de Chocolate y Cacao Finos</td>
</tr>
<tr>
<td>CBI</td>
<td>Centre for the Promotion of Imports from developing countries, the Netherlands</td>
</tr>
<tr>
<td>CoEx</td>
<td>Cocoa of Excellence Programme</td>
</tr>
<tr>
<td>CDP</td>
<td>USAID-Equal Exchange-TCHO Cooperative Development Program</td>
</tr>
<tr>
<td>CRC</td>
<td>Cocoa Research Centre of the University of the West Indies, Trinidad and Tobago</td>
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<tr>
<td>CRS</td>
<td>Catholic Relief Services</td>
</tr>
<tr>
<td>EE</td>
<td>Equal Exchange</td>
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<tr>
<td>FCCI</td>
<td>Fine Cacao and Chocolate Institute</td>
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<tr>
<td>FCIA</td>
<td>Fine Chocolate Industry Association</td>
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<tr>
<td>ECOM</td>
<td>ECOM Agroindustrial Corporation. Ltd</td>
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<tr>
<td>IFCIC</td>
<td>International Fine Cocoa Innovation Centre</td>
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<tr>
<td>HCP</td>
<td>Heirloom Cacao Preservation Fund</td>
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<tr>
<td>ICA</td>
<td>International Cocoa Awards</td>
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<tr>
<td>ICCO</td>
<td>International Cocoa Organisation</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>ISCQF</td>
<td>International Standards on Cocoa Quality and Flavour Assessment</td>
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<tr>
<td>LWR</td>
<td>Lutheran World Relief</td>
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<tr>
<td>MOCCA</td>
<td>Maximizing Opportunities for the Coffee and Cocoa Sector of the Americas</td>
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<tr>
<td>PSU</td>
<td>Penn State University</td>
</tr>
<tr>
<td>SDC</td>
<td>Swiss Agency for Development and Cooperation</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>WG</td>
<td>Working Group</td>
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Executive Summary

The members of the Working Group (WG) on the Development of International Standards for the Assessment of Cocoa Quality and Flavour (ISFCQ) met in Paris, France, on 31 October – 2 November 2018 to review draft cacao1 quality assessment protocols and discuss the progress made thus far since the broad consultations in 2017. Bioversity International and the Cocoa of Excellence Programme (CoEx) organized the meeting, with financial support from Lutheran World Relief (LWR), USDA-Penn State University (PSU), Salon du Chocolat, Bioversity International and the CGIAR Research Programme on Forest, Trees and Agroforestry, with in-kind contributions from the participating organizations. This document summarises highlights of the WG meeting and some of the information presented. It also provides an in-depth review of the 20 draft cacao protocols being developed by the WG, discussion on the broader strategic issues, main agreements and areas of further research and next steps.

The WG was set up in 2015, under the coordination of Bioversity/CoEx, to address the urgent need of the actors across the cocoa value chain for accepted, credible and verifiable protocols to assess and communicate about cocoa quality and flavour using a common language. A first proposal on international standards, based on an in-depth review of existing protocols used by different organizations, was developed by Dr Darin Sukha between February and May 2016. This proposal was presented at a number of international and regional fora (ICCO, WCF and others) in 2016 and 2017 and discussed in two broad stakeholder consultations held in Managua (September 2017) and in Paris (October 2017).

Based on the recommendations of these consultations, 20 individual protocols were drafted, building on the first proposal, starting with the protocols on sample preparation and physical evaluation of cocoa beans, followed by those pertaining to flavour assessment. The ISFCQ WG members were invited to provide feedback through emails, conference phone calls, during a lunchtime meeting in New York on 29 June 2018 and a technical Task Force focusing on bean roasting was set up. Project proposals for funding opportunities were also developed in 2017 that led to the USDA-Penn-State University project (PSU) proposal from July 2018 to June 2019 and the USDA-TechnoServe-LWR project - Maximizing Opportunities for the Coffee and Cocoa Sector of the Americas (MOCCA) from 2019-2021.

During the WG meeting, members reviewed 12 of the 20 drafted protocols in detail. Small breakout groups were formed to review, discuss and provide specific feedback, which was presented and further discussed in plenary. The format of the breakout group sessions maximised participation, discussion and input, where key comments were recorded to be reported back at plenary.

Discussions on strategic issues focused on: the overall goal, objectives, users and ownership of the international standards; membership, formalisation and coordination of the WG; communication and further development of the standards towards a complete first draft in the second quarter of 2019.

The conclusions of the meeting are summarised as follows:

- Good progress has been made since the Managua-Paris consultations in September-October 2017
- This WG meeting has provided rich feedback and inputs, to be implemented in the next revision of the draft protocols

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1 This document uses the word “cacao” for the plant and the unprocessed seeds of the species *Theobroma cacao*. The word “cocoa” refers to the seeds, commonly known as “beans”, once these are harvested, fermented and dried. Definitions taken from: CacaoNet (2012). A Global Strategy for the Conservation and Use of Cacao Genetic Resources, as the Foundation for a Sustainable Cocoa Economy (B. Laliberté, compiler). Bioversity International, Montpellier, France.
Bioversity International will continue its coordination of the WG and drafting of the protocols for review by the WG and additional experts.

The WG will be formalised with a Memorandum of Understanding to be reviewed and signed by all members.

WG members will continue providing feedback on protocols to support the drafting team through email, conference call discussions and in person meetings when possible.

The Task Force on Roasting will continue finalising the protocol.

Additional task forces will be created to maximise the involvement of all WG members.

The proposed MSc research projects (6 months) will be followed-up in early 2019 on key research questions.

The first draft of the protocols that form the ISQF will be completed by May 2019 as a deliverable for the USDA-PSU project.

The WG will play a guiding role in the implementation of the MOCCA project starting in 2019.

The organizers of the meeting, partners, sponsors and WG members would like to thank all the individuals and organizations who have contributed to the development of the International Standards for the Assessment of Cocoa Quality and Flavour. Their input is essential to ensure the process is science-based, inclusive and builds on best practices in this area.
1. Introduction

1.1. Background

Buyers of cocoa beans seek a variety of quality and flavour profiles from the different cocoa cultivars, producers and regions. However, there is a need for a standardized system that must facilitate communication among sellers, buyers and consumers of cocoa and chocolate. In so doing, cocoa farmers can properly present the value proposition of their cocoa to potential buyers. To achieve this, there is a critical and urgent need to: establish accepted, credible, quantifiable and verifiable protocols for assessing and communicating cocoa quality and flavour; facilitate comparison among samples; and provide feedback towards improving post-harvest processes for different cocoa genetics (‘terroirs’) and production systems around the world.

A working group set up in 2015, coordinated by Bioversity International (Bioversity thereafter) and the Cocoa of Excellence Programme (CoEx), initiated discussions on the development of international standards for the assessment of cocoa quality and flavour. The initial work, supported by the Cocoa Research Centre (CRC) of the University of the West Indies, Lutheran World Relief (LWR), the United States Department of State and Swiss Agency for Development and Cooperation (SDC) and the CoEx, consisted of carrying out an inventory of existing standards and protocols used by different groups and individuals involved in the production of cocoa and other commodities such as coffee, wine and olive oil, as reported in the publication by Sukha (2016)\(^2\). Based on the review, a first proposal for international standards was developed (Sukha, 2016a)\(^3\).

Two broad stakeholder consultations took place in Managua in September 2017 and a follow-up in October 2017 during the Salon du Chocolat in Paris to engage cocoa value-chain actors in reviewing the proposed international standards and align the different approaches to establishing standards. Both consultations were organized by Bioversity/CoEx with support from LWR, the Asociación Mesoamericana de Cacao y Chocolate Finos (AMACAACO), Christian Aid and Catholic Relief Services (CRS). The report is available at: [http://www.cocoaofexcellence.org/info-and-resources/quality-and-flavour-assessment/](http://www.cocoaofexcellence.org/info-and-resources/quality-and-flavour-assessment/)

From the broad consultations, the following next steps were implemented:

1. Moving forward with the revision of the standards document, based on the proposed reorganization of information and the continued compilation of existing protocols available in the public domain
2. Identifying the protocols ready for immediate use
3. Identifying the protocols for which only limited discussion is needed to come to an agreement
4. Focusing initially on the sections covering sample preparation to build trust and consensus
5. Initiating work on testing equipment in different locations
6. Forming small technical working groups for specific areas that require discussion for agreement
7. Keeping the collaboration inclusive and open for input
8. Ensuring that the protocols become global public goods.

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1.2. Meeting of the Working Group on the Development of International Standards

The members of the Working Group on the Development of International Standards for the Assessment of Cocoa Quality and Flavour (ISCQF) met in Paris, France, on 31 October – 2 November 2018. Bioversity /CoEx organized the meeting, which was co-financed by Lutheran World Relief (LWR), USDA-Penn State University (PSU), Salon du Chocolat, and the CGIAR Research Programme on Forest, Trees and Agroforestry. The following participating institutes provided in-kind support: Guittard Chocolate Company, Seguine Cacao Cocoa and Chocolate Advisors, Cocoa Research Centre of the University of the West Indies in Trinidad and Tobago (CRC), Barry Callebaut, Centre for the Promotion of Imports from Developing Countries (CBI), ECOM, Cooperative Development Program (CDP), Fine Cacao and Chocolate Institute (FCCI), Puratos/Belcolade and Valrhona.

The OBJECTIVES of the meeting were to:

1. Review progress to date since Managua-Paris of September-October 2017
2. Address strategic issues for long-term sustainability of the initiative
3. Review draft protocols
4. Agree on a completion process for all protocols
5. Agree on broader input into the protocols
6. Identify research questions and ongoing projects with which to engage and seek collaboration
7. Discuss implementation within ongoing and planned projects such as USDA/LWR project MOCCA in Latin America
8. Review the WG’s role and define membership use
9. Propose key upcoming events as opportunities to meet, consult and present the WG’s work

The EXPECTED OUTPUTS were the following:

1. Agreement on the next steps towards completion of the protocols
2. Proposed collaboration with key projects
3. Strategic direction and long-term sustainability explored
4. Revised role and membership of the Working Group defined/agreed
5. Broader consultation proposed
6. Research projects with which to collaborate identified

The ISCQF-WG had at the time of the meeting, 19 members including organizations representing cocoa producers, chocolate makers, traders, processors and researchers directly involved in cocoa quality and flavour assessment. The WG members are listed in Annex A.

Brigitte Laliberté, Bioversity/CoEx and Coordinator of the WG, summarized the objectives of the meeting and the proposed programme (details provided in Annex B).

The Managua and Paris consultations formulated the following goal and objectives of the ISCQF:

WHAT? (Goal)
• Clear communication on flavour and quality throughout the value chain - (cocoa producers, bean buyers/traders, chocolate makers and other users) – using common tools and language.

WHY? (Objectives)
• To identify the intrinsic flavour attributes and characteristics (flavour potential) of the beans when beans are converted into chocolate
• To unlock value and empower producers and buyers – so users can decide how to use the beans
• For targeted marketing and flavour customization – to better meet customers’ needs.
FOR WHOM? (Principal stakeholders/beneficiaries)
- Cocoa value chain actors: from cocoa producers, bean buyers/traders, chocolate makers to consumers.

The following pre-competitive guidelines were also presented:
- The objectives of the WG meeting are to review progress, address strategic issues for the long-term sustainability of these efforts, review draft protocols and agree on the completion process for all protocols and next steps
- The results of the meeting will be placed in the public domain via the publication of the meeting report
- While the goal of the meeting is to encourage a free and inventive discussion in relation to the meeting objective, for the sake of clarity, meeting participants should avoid any form of discussion or exchange of confidential information, which may give rise to legal issues regarding unlawful competition with the scope of the WG law concerns.
- The meeting will be facilitated by Bioversity International.

The meeting gathered 27 participants (15 women and 12 men), including representatives from 14 out of the 19 WG members, the participation of Barry Callebaut, Penn State University and the team that drafted the protocols under the coordination of Bioversity/CoEx. The meeting participants are listed in Annex C.

1.3. Progress review since November 2017
Dolores Alvarado, from Bioversity, presented a review of the work done since the consultation in Managua and Paris in September-November 2017.

The main activities carried out were the following:
- Expansion of the WG to include additional members
- Restructuring of the technical information for the quality and flavour assessment of cocoa, based on the first proposal of international standards lead by Dr Darin Sukha in May 2016
- Content development for a manual of protocols consisting of the individual protocols proposed
- Compilation of additional/new information available in the public domain on cocoa quality and flavour assessment
- Development of individual protocols, with the first ones on sample preparation and physical evaluation, followed by the ones on flavour assessment
- MSc research project undertaken related to the ISCQF on the quantification of key taste compounds related to bitterness and astringency in cocoa liquors (Alvarado August 2018)4
- Implementation of the first technical Task Force for specific recommendations on roasting protocols
- Development of project proposals in response to relevant funding opportunities
- Regular update and consultation with the WG members in preparation for the meeting in Paris Oct-Nov 2018.

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The team that drafted the ISQF protocols facilitated the activities and recorded all suggested revisions and updates relating to the original draft. Figure 1 provides an overview of the 20 protocols in relation to the process from bean to chocolate: protocols for sampling and physical evaluation of the beans (5) are shown in yellow; protocols for sample preparation of cocoa liquor (4) and chocolate (3) are shown in blue; protocols for sensory evaluation (4) are shown in green, and in grey are the protocols drafted but with a lower priority for the WG meeting (4).

Figure 1. Overview of 20 protocols in relation to the process from bean to chocolate. In yellow: sampling and physical evaluation, blue: sample preparation, green: sensory evaluation, grey: drafts not ready for the WG meeting.
The following protocols were made available to the WG members, via a Dropbox link in advance of the meeting for their review (specific date indicated) and a revised version printed for the meeting:

1. Sampling of bagged and bulk cocoa beans – 14/09/2018
2. Moisture content of beans – 14/09/2018
3. Bean count, weight and cleaning loss – 14/09/2018
4. Cocoa butter content – 18/10/2018
5. External appearance and aroma of whole and cut beans – 14/09/2018
6. Roasting of cocoa beans – 18/10/2018
7. Breaking and winnowing – 14/09/2018
8. Coarse/pre-grinding – 14/09/2018
9. Liquefying cocoa mass – 14/09/2018
10. Chocolate formulation – 18/10/2018
11. Mixing, refining and conching chocolate – 18/10/2018
12. Tempering and moulding chocolate – 18/10/2018

Feedback was provided on strategic issues, technical information format, structure and language of the protocols. The most important questions raised/comments received were the following:

- Will the ISCQF include a grading system for overall quality of cocoa beans?
- Who are the target users of the protocols?
- What are the links between the protocols and other existing standards?
- The protocols are very detailed, which is valuable, but some may be too technical and difficult to implement.
- Questions and recommendations on technical issues such as the size of a representative sample, the number of beans for the cut test, the descriptors for cut test aroma, the roasting conditions, the particle size of cocoa liquor, and the chocolate formulation.

It was suggested that Task Forces be set up to tackle key technical issues for specific protocols, with the following general principles:

- Purpose: to discuss specific technical issues in detail and make recommendations to the WG
- Size: 5-7 members
- Members: based on expertise, with significant knowledge and experience in the topic and preferably be part of the WG
- Working method: via email and with occasional video conference calls as needed
- Duration: a few months

The Task Force on the roasting protocol was formed in March 2018 and the members were: Brad Kintzer, Dan Domingo, Darin Sukha, Ed Seguine, Julien Simonis and Pierre Costet supported by the standards’ team with Brigitte Laliberte, Dolores Alvarado, Chinkee Lim, Sue Gonzalez and Pramitha Pothan (see Figure 2). The team prepared the documentation and materials for discussion. Whilst the interactions by email were limited, the video conference calls were successful in stimulating discussions, coming to agreements and identifying key research questions. Advance preparation was essential.
The WG meeting was therefore the opportunity to provide open and honest feedback on the protocols drafted to date and make specific recommendations for their finalisation.

### 1.4. Updates from participants

Updates from all participants were provided on activities related to the development of standards summarized below.

**Barry Callebaut**

Barry Callebaut has a sensory evaluation methodology to link the bean quality to the chocolate, based on ISO standards. They have their own physical reference samples produced with the cocoa they have from a large range of origins and chocolate. A tasting of Barry Callebaut chocolate samples produced with different roasting processes took place, whilst Renata Januszewska presented some examples of their protocols used for sensory evaluation.

**CBI - Centre for the Promotion of Imports from developing countries**

CBI is completing its work in Peru on cocoa and chocolate standards, supporting exporters. Nubia Martinez is the expert working on the Peruvian national standard for sensory evaluation, together with the government, universities, ministries, association of cocoa producers and trade organizations, which were approved by the national organization of standardization INACAL (Instituto Nacional de Calidad) in December 2018. CBI’s next project on cocoa is in Central America where they will work with producer organizations to open opportunities for exporters to European markets. They will also start new projects in West Africa, Nigeria, Sierra Leone and Guinea.
CDP – USAID-Equal Exchange-TCHO Cooperative Development Programme

CDP is in the last phase of the USAID project that lasted seven years in Dominican Republic, Ecuador and Peru. After developing a cocoa liquor tasting form, they are finalising a protocol for cocoa liquor preparation and a training curriculum that forms part of a kit for cocoa chain actors that will be publicly available. Cristina Liberati distributed printed copies of CDP’s “Guide to the Cacao and Sensory Analysis Tasting Form” also available online at https://equalexchange.coop/usaid-cooperative-development-program.

CoEx - Cocoa of Excellence Programme and International Cocoa Awards (ICA)

The CoEx-ICA will celebrate its 10th Anniversary during the 2019 Edition. The key focus of this programme has always been excellence in cocoa from around the world. The CoEx has seen a clear improvement in cocoa quality from countries participating in more editions. National competitions are aligning to the use of CoEx protocols—from physical bean quality and flavour assessment to liquor and chocolate sensory evaluation—in selecting the samples within the country. The competition celebrates diversity within and between cocoa-producing regions. The CoEx Technical Committee is producing physical reference samples available for some national partners and is refining the protocols, evaluation spreadsheet detail and glossary of terms.

CRC - Cocoa Research Centre of the University of the West Indies

In Trinidad and Tobago producers are paying serious attention to cocoa quality, and they need standards. Currently CRC is working on the development of national standards along with the setup of the International Fine Cocoa Innovation Centre (IFCIC) to serve national, regional and international cocoa needs along the value chain. They are also training several national panels and setting up labs in some of the countries in Central and South America.

FCCI - Fine Cacao and Chocolate Institute

FCCI has a sampling protocol to prepare and taste unroasted cocoa beans as coarse powder accessible as a complementary evaluation to liquor and chocolate evaluation. Their objective is to create a tool that is easy to use in a lab or in the field with or without electricity. It is currently used in 33 countries for small and large batches of cocoa beans.

FCIA - Fine Chocolate Industry Association, HCP - Heirloom Cacao Preservation and ECOM

FCIA has initiated a series of positive changes in the last years, including a new board with Bill Guyton as the Executive Director. FCIA is focusing on strengthening connections with cocoa producing countries. HCP is a sister organization of FCIA. Its main objective is to identify unique trees (genetics and flavour) for safeguarding and multiplication, in order to preserve cocoa quality and diversity. Sites have been set up in Belize, Costa Rica, Ecuador and Hawaii. ECOM is working on farmers’ education on flavour and fine cocoa production in many countries.

Guittard Chocolate Company

Guittard has continued the WCF/USAID Africa Cocoa Initiative (ACI) work with CRIG in Ghana (started by TCHO) now in its 5th year. Through this programme, they recently inaugurated another cocoa sensory lab at CNRA (Centre National de Recherche Agronomique) in Cote d’Ivoire. A third ACI lab is scheduled to be set up in Nigeria or Cameroon. In 2017 with the support of Swisscontact and Millennium Challenge, Guittard set up a lab and cocoa sensory panel at ICCRI (Indonesian Coffee & Cocoa Research Institute). All labs use the suggested suite of equipment for quality assessment and preparation of liquor samples, as well as CoEx-based physical reference liquor samples for calibration. The training of farmers is focused on the identification of off-flavours caused by bad fermentation or diseases.
LWR - Lutheran World Relief

LWR presented the project Maximizing Opportunities in Coffee and Cacao in the Americas, MOCCA. The USDA-funded project will be implemented by Technoserve and LWR to strengthen the coffee and cacao sectors in six Latin-American countries: Ecuador, El Salvador, Guatemala, Honduras, Nicaragua and Peru. The MOCCA project objectives are to: improve the livelihoods of cocoa farmers by increasing crop yields, improve cocoa quality, increase capacity and facilitate links between sellers and buyers. LWR will partner with Bioversity for two components: 1) the conservation of national collections of cacao in CRC (Trinidad) and CATIE (Costa Rica) to facilitate the farmers’ access to high quality genetic materials, 2) to support the CoEx in providing guidance for National Competitions that are clearly aimed at increasing capacity, in cocoa producing countries, on creating quality and consistency of their cocoas. In this component the focus will be on finalizing and implementing the ISCQF under the guidance of the WG. The 5-year project will start in March 2019 and will support continuous work on the development and implementation of the ISCQF.

PSU - Penn State University

Having 50 years of experience in cacao and chocolate research, Penn State University has recently established sensory science facilities under the direction of Prof. Helene Hopfer. PSU has a USDA-funded project from June 2018, which supports the release of ISCQF’s first drafts in May 2019.

2. In-depth review of the ISCQF draft protocols

2.1. Methodology

The review of the draft protocols was organized in three sessions of small group discussions followed by reports and feedback in plenary. Printed copies were available for all participants. The protocols were grouped in the following categories:

- Group A) Draft protocols on cocoa bean sample preparation circulated on 14 September 2018 for when the process does not affect the flavour, and for which feedback had been received by email before the meeting.
- Group B) Draft protocols for when the process affects the flavour and that require in-depth discussion and agreement.
- Group C) Draft protocols for sensory evaluation from beans, to liquor and chocolate.

The other draft protocols were considered of lower priority for group discussions because the process is mostly based on existing ISO standards and/or the topic is broader. Participants agreed to continue their review and provide feedback by email and calls.
The following groups of protocols were formed:

<table>
<thead>
<tr>
<th>Group</th>
<th>Protocols</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>1. Sampling of bagged and bulk cocoa beans&lt;br&gt;2. External aroma and appearance of whole and cut beans (cut test)&lt;br&gt;3. Coarse/pre-grinding cocoa nibs&lt;br&gt;4. Liquefying cocoa mass&lt;br&gt;5. Tempering and moulding chocolate</td>
</tr>
<tr>
<td>Lower priority</td>
<td>13. Moisture content of beans&lt;br&gt;14. Bean count, weight and cleaning loss&lt;br&gt;15. Breaking and winnowing cocoa beans&lt;br&gt;16. Cocoa butter content&lt;br&gt;(print outs of these protocols were available during the meeting)&lt;br&gt;17. Storage and aging of cocoa products&lt;br&gt;18. Food safety considerations&lt;br&gt;19. Measurement of contaminants&lt;br&gt;20. Micronizing infrared for food safety&lt;br&gt;(these protocols were not ready for the WG meeting)</td>
</tr>
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</table>

REVIEW of GROUP A Protocols

For the review of the protocols in Group A: (1) Sampling of bagged and bulk cocoa beans, (2) External aroma and appearance of whole and cut beans (cut test), (3) Coarse/pre-grinding cocoa nibs, (4) Liquefying cocoa mass, and (5) Tempering and moulding chocolate, participants selected the one they were most interested in. The protocol on tempering and moulding chocolate was not selected and will therefore continue to be reviewed after the meeting. Four groups of 5-6 participants were formed, facilitated by a member of the standards’ team to capture the key points of feedback and report in plenary. The process was the following:

1. Moderator briefed the group on the key points of feedback received to date
2. All participants took 15 minutes to read the document
3. Discussions took place on all aspects for 30 minutes
4. The group summarised the feedback for 15 minutes
5. Each group reported the main feedback in plenary, followed by a general discussion, for each of the four protocols.

REVIEW of GROUP B Protocols

For the review of the protocols in Group B: (1) Roasting cocoa beans, (2) Mixing, refining and conching chocolate and (3) Chocolate formulation, participants were randomly distributed into three groups of 6-7 people, also facilitated by a member of the standards’ team. The process was the following:

1. Moderator briefed the group on the key points of feedback received
2. All participants took 15 minutes to read the document
3. Discussions took place on all aspects for 15 minutes
4. All participants were re-distributed to a new group for 30 minutes to build on previous discussions
5. The group summarised the feedback for 15 minutes
6. Each facilitator reported the main feedback in plenary and a general discussion followed for each protocol.

REVIEW of GROUP C Protocols

For the review of the protocols in Group C: (1) Coarse powder sensory evaluation, (2) Cocoa liquor sensory evaluation and (3) Chocolate sensory evaluation—since these are the most challenging protocols and need to be reviewed by all participants in detail—the process adopted was that each of the protocols would be discussed one after the other, starting with the protocol on Coarse powder sensory evaluation. The group suggested that all participants read these protocols that had been distributed the day before to allow participants to familiarize with them and speed up the feedback process. The process, also facilitated by a member of the standards’ team, was the following:

1. Three groups were formed and each discussed the protocol on Coarse powder sensory evaluation
2. Moderator briefed the group on the key points for feedback
3. All participants took 15 minutes to read the document
4. Discussions took place on all aspects for 15 minutes
5. All participants were re-distributed to a new group for 30 minutes to build on previous discussions
6. The group summarised the feedback for 15 minutes
7. Each facilitator reported the main feedback in plenary, followed by a general discussion.

The process was repeated for the protocol on Cocoa liquor sensory evaluation. However, due to time constraints, the protocol on Chocolate sensory evaluation was not discussed and the group suggested to review the protocol taking into consideration the feedback on the other two sensory evaluation protocols that would apply and follow-up after the meeting.

The review methodology seemed to maximise discussion and inputs, and the reporting effective enough to capture the key comments summarised in Section 2.2 below.

2.2. Summary of feedback on the specific protocols reviewed

The feedback received during the small groups and plenary discussions is classified into the four levels described below:

<table>
<thead>
<tr>
<th>Level</th>
<th>Areas and issues covered by comments</th>
<th>Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Format, structure and layout, specific or general to all protocols</td>
<td>These were noted and will be resolved after the meeting</td>
</tr>
<tr>
<td>2</td>
<td>Small but important technical details to be clarified, specific to a protocol</td>
<td>Some were resolved during the meeting and some may be resolved afterwards through a Task Force or in discussions with a few people willing to provide feedback or with expertise</td>
</tr>
<tr>
<td>3</td>
<td>Decisions that need to be held on key technical issues specific to a protocol</td>
<td>Depending on their critical importance, these could be resolved in small groups or in plenary</td>
</tr>
<tr>
<td>4</td>
<td>Larger strategic issues specific to one or all protocols</td>
<td>Very important issues to resolve during the meeting and have a clear plan to resolve</td>
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</table>
The key points are summarised below and the detailed feedback comments at all levels was documented in a separate document circulated to the meeting participants for review after the meeting and used for the next version of each protocol.

Level 1: Feedback on format, structure and layout specific or general to all protocols

The feedback in this area related mainly to the use of language, citation of references and improvement of text structure. For example, recommendations were to simplify the numbering system, seek/gain further advice from experts in protocol writing and graphic design to improve the structure and navigation in and across protocols, add flow charts for specific protocols, define/eliminate some technical terms, clarify what information comes from ISO, further define the section General Notes or re-organize the information in other sections. Another recommendation is to insert a watermark indicating that the protocols are drafts and should not be circulated outside the WG until all agree. All these proposed revisions will be implemented as an immediate follow-up to the meeting by the standards’ team.

Level 2: Feedback on small but important technical details to be clarified, specific to a protocol

Feedback was provided on areas needing further clarification, avoiding over-complicated mathematical formulas, correcting information or description of steps, avoiding the name of specific equipment brands, eliminating steps that may be optional and adding pictures where useful. For example, for the protocol on sampling, recommendations were to clarify the procedure to be applied not only at reception of the beans but also at the pre-shipment stage. For the protocol on Chocolate formulation, recommendations were to simplify how to calculate the amount of ingredients and build a spreadsheet to calculate it. For the protocol on Roasting of cocoa beans, the recommendation was to complete the description of the cooling step. And for the protocol for Coarse powder sensory evaluation, the recommendation was to consider eliminating the optional addition of a sweetener.

Level 3: Feedback on decisions that need to be held on key technical issues specific to a protocol

The feedback was mainly related to the objectives, equipment, process specifications, definitions of key technical terms and coherence between related protocols. For example, recommendations were to check the objective of the Coarse powder sensory evaluation to include the detection of defects and consider the application of this protocol only to un-roasted beans. For the roasting protocol, participants discussed the options for roasting conditions and the relevant advantages and disadvantages of including one or more of the considered options. For the sensory evaluation protocols, participants discussed the use of sub-attributes and the assessment of global score and uniqueness. The global quality score is to be applied to all cocoa. Some were keen to include it as farmers have repeatedly asked for it, but others were concerned about the negative consequences of having such a score on potential loss of flavour diversity or potential influence on pricing. The participants agreed to better define what such a score would assess and how it could be calculated considering all the different aspects involved, such as: presence/absence of defects, flavour attributes, uniqueness, flavour complexity, balance and composition. Participants agreed to build a task force to address this important issue. In the specialty coffee sector, such a grading system already exists, and it may therefore be unavoidable in the future for cacao. The CDP protocol includes a grading system that is used to calculate a final score but there was no discussion on how this aligns with other initiatives like the CoEx Global Quality Score. For the time being, the group recommended excluding it until it is further defined. Another key issue raised was on the representativeness of the cocoa bean sample used for a specific assessment. Although the sample obtained from the sampling process is representative, only a portion of this sample is taken for a specific
test. For example, the number of beans for the cut test: ISO suggests 100, but the FDA (USA Food and Drugs Administration) advises 300. How many beans are needed for a representative result of the whole lot is a key issue at all levels including for flavour assessment of beans, powder, liquor and chocolate. On these key issues, most participants recommended forming task forces and/or carrying out research projects for further scientific evidence supporting specific recommendations.

**Level 4: Feedback on larger strategic issues specific to one or all protocols**

General feedback on the protocols included discussion on whether some of the protocols are necessary, the importance of representative test samples, the cost of implementing certain protocols including equipment, setting up and training, the suggestion to have different potential users review them including those who many not be familiar with the topic. It was therefore suggested to calculate the cost associated with the equipment and facilities needed for each protocol. Participants suggested identifying a mechanism for the regular update of the protocols and a way to protect the intellectual property of the work conducted to date. Participants also recommended aligning the ISCQF to other international and national standards, and with cocoa companies’ existing quality systems.

### 3. Discussion on strategic issues and coordination of the WG

The participants identified the following broader strategic issues that require focused discussions:

1. The overall goal, objectives, users and ownership of the ISCQF
2. Membership and formalisation of the Working Group
3. Coordination of the Working Group, communication and further development of the ISCQF.

**The overall goal, objectives, users and ownership of the ISCQF**

The group reviewed the goal, objectives and purpose of the ISCQF and stressed the need to clarify who the users are. Stakeholders along the value chain differ in levels of education, organization, and availability of resources (human, infrastructure, equipment, financial). Anybody working in cocoa quality control—from cocoa producers to chocolate manufacturers—must be able to use the ISCQF protocols. The protocols shall be the basis for developing specific training materials adapted to each of the users’ groups in a simplified and user-friendly manner. Frequent updates of the ISCQF should be minimised.

Participants discussed the ownership and financial support for the ISCQF, as well as the training and certification. Since the consultation in Managua/Paris in 2017, the work done has been funded by Bioversity, the CoEx, LWR, the USDA-PSU project and all the in-kind contributions of the WG members. The USDA-PSU support will conclude in May 2019 and the new MOCCA project starting in 2019 for three years.

Participants discussed the long-term sustainability of this initiative and the possibility of creating a new organization or build on existing ones such as: Bioversity, CAOBISCO, CMA, CoEx, ECA, FCIA, FCCI, ICCO and WCF. The options will be analysed and further elaborated within the context of the USDA-LWR project. Preparatory work will be needed to further define its role and functions. It was also suggested that more than one organization share responsibilities, covering different aspects of the ISCQF such as the keepers of the standards, the development of reference samples, training and certification, similarly to the situation in the case of coffee.
Membership and formalisation of the Working Group

The group discussed the representation of some stakeholders in the WG, which could be increased such as the participation of cocoa producing countries (cocoa exporters, producer associations/cooperatives and innovation centres) and those possibly missing such as representation from every cocoa producing region of the world. Caution was advised for the WG not to be too "America-Centric". The decision-making process of the WG shall consider the stakeholders not present but affected by the implementation of the ISCQF. In order to formalise the structure of the WG, a Memorandum of Understanding (MoU) or letter of intent including the goal and objectives of the ISCQF, Terms of References of the coordination and members should be agreed between each members and the coordination including a Non-Disclosure Agreement (NDA). The use of the WG members’ logos and attribution should be agreed by all.

Coordination of the ISCQF Working Group and communication

Since September 2015 Bioversity has been coordinating the WG including broader consultations and drafting of the protocols. Brigitte Laliberté, on behalf of Bioversity, requested a vote of confidence to continue the coordination in a more formal manner. The group discussed the formalisation of the coordination and if anybody in the WG proposes to coordinate the initiative. Participants expressed their satisfaction with the coordination by Bioversity and endorsed the mandate to continue the coordination until the completion of the MOCCA project in early 2022, at which point it will be reviewed.

The group suggested to set up regular meetings using online platforms in addition to emails to get feedback on the protocols and the way forward; plan meetings well in advance; and communicate to the broader community the goal, importance, and benefits of the ISCQF.

4. Conclusions, Research and Next Steps

Below is a summary of the group agreements, the area where more research and expert advice is needed and proposed next steps.

Conclusions:

- Good progress has been made since the Managua-Paris consultations in September-October 2017.
- Rich feedback and inputs have been provided by everyone during this meeting, to be implemented in the next version of the protocols.
- Bioversity will continue the coordination of the WG and the drafting of the protocols for review by the WG and additional experts.
- The current draft protocols will include a ‘Draft for comment’ watermark (or similar) and not be circulated outside the WG until the members agree on how and when this should be done. The earlier drafts will be deleted from the shared Dropbox.
- The WG to be formalised with an MoU to be reviewed and signed by all members.
- WG members will continue providing feedback on the protocols to the drafting team to be facilitated by phone calls and meetings when possible.
- The Task Force on roasting will continue.
- New Task Forces will be created to maximise the involvement of all WG members.
- Follow-up with proposed MSc research projects (6 months) in early 2019 on research questions related to key technical issues – see section below.
• The first draft of the protocols that form the ISCQF to be completed by May 2019 as a deliverable for the USDA-PSU project.
• The WG will play a guiding role in the implementation of the MOCCA project starting in 2019. More information will follow shortly.

More research/expert advice needed to:

• Define the global quality score and investigate a way to calculate it based on attributes
• Test and select optimum roasting conditions for the processing of liquor for flavour assessment of beans
• Verify the representativeness of samples used in each test described in the protocols
• Test different chocolate formulations to ensure that the broad range of flavour diversity can be evaluated and compared
• Explore how the maximum conching time can be determined using melanger-type grinders
• Analyse the assessment of flavour of beans from coarse powder, to liquor and chocolate to understand how attributes change along the process pathway.

Next steps:

• WG coordination and protocol drafting team to:
  o Revise the protocols based on the detailed feedback received
  o Continue to coordinate the Task Force on the Roasting Protocol
  o Create new Task Forces on:
    ▪ Global quality score – definition, calculation and relation to uniqueness
    ▪ Sensory glossary of terms and intensity scale – one only glossary that includes the descriptors to be used for all sensory evaluations in the manual: cocoa coarse powder, cocoa liquor, chocolate and aroma of whole and cut beans
    ▪ Sensory evaluation protocols for cocoa coarse powder, cocoa liquor and chocolate
    ▪ Use and production of physical reference samples for calibration (liquors, coarse powder, chocolate)
    ▪ Definition of particle size and maximum grinding time for cocoa liquor and chocolate
    ▪ Chocolate formulation options and procedure of chocolate making.

• WG members to:
  o Provide feedback on revised protocols following a proposed schedule
  o Participate in relevant Task Forces to be formed shortly, based on expertise and current activities
  o Provide inputs into the formalisation of the WG and the proposed MoU
  o Provide guidance to the USDA-LWR project implementation from March 2019 onwards.
Annex A – Members of the Working Group on the International Standards for the Assessment of Cocoa Quality & Flavour (at the time of the meeting)

1. AMACACAO/CUNAKakaw: Juan Francisco Mollinedo - AMACACAO/CUNAKakaw, Guatemala
2. Belcolade/Puratos: Julien Simonis - Belcolade/Puratos, Belgium
3. CAF/ILAC: Federico Vignati - Iniciativa Latinoamericana del Cacao, Peru
4. CBI: Nubia Martinez - Centre for the Promotion of Imports from Developing Countries, Peru
5. CoEx: Brigitte Laliberté - Bioversity International/CacaoNet/Cocoa of Excellence Programme - Coordinator of the WG, Italy
6. CRC: Darin Sukha - Cocoa Research Centre, The university of the West Indies, Trinidad and Tobago
7. CRS: Kraig Kraft - Catholic Relief Services, El Salvador
8. ECOM: Daniel Domingo - ECOM, USA
9. EE/CDP: Christina Liberati - Equal Exchange, USA
10. FCCI: Carla Martin - Fine Cacao and Chocolate Institute, USA
11. FCIA: Brad Kintzer, Vice-President of the Fine Chocolate Industry Association, USA
12. Guittard: John Kehoe - Guittard Chocolate, USA
13. ICCO: Charlotte Martin - International Cocoa Organization, Côte d'Ivoire
14. IICCT: Martin Christy - International Institute of Chocolate & Cacao Tasting, UK
15. LWR: Carolina Aguilar - Lutheran World Relief, USA
16. LWR: Rick Peyser - Lutheran World Relief, USA – providing critical input from the coffee sector
17. Seguine/Guittard: Ed Seguine - Seguine Cacao and Chocolate/Guittard Chocolate, USA
18. Valrhona: Pierre Costet – Valrhona, France
19. WCF: Paul Macek - World Cocoa Foundation, USA
### Annex B – Programme of the WG on ISCF meeting – Paris 2018

**Wednesday 31 October**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:30</td>
<td>• Welcome and introduction of participants</td>
</tr>
<tr>
<td></td>
<td>• Update from Managua/Paris Sept-Oct 2017 - Where we are today - and summary of feedback received so far on protocols</td>
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<tr>
<td></td>
<td>• Review of meeting objectives, expected outputs, approval of proposed programme</td>
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<tr>
<td></td>
<td>• Overall recap of larger strategy – what and why</td>
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<tr>
<td>15:30-16:00</td>
<td>Coffee/tea break – served in the meeting room</td>
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<tr>
<td>16:00-18:00</td>
<td>• Updates from all participants on initiatives linked to the standards</td>
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<td></td>
<td>• Initial discussion on strategic issues</td>
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**Thursday 1 November**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activities</th>
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</thead>
<tbody>
<tr>
<td>09:30-11:30</td>
<td>• Recap of previous day</td>
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<tr>
<td></td>
<td>• Review of the first set of draft protocols – breakout groups A</td>
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<tr>
<td></td>
<td>o Sampling of bagged and bulk cocoa beans</td>
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<td></td>
<td>o External aroma and appearance of whole and cut beans (cut test)</td>
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<td></td>
<td>o Coarse/pre-grinding cocoa nibs</td>
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<td></td>
<td>o Liquefying cocoa mass</td>
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<td></td>
<td>• Plenary discussions on areas of agreement and of improvements</td>
</tr>
<tr>
<td>11:30-11:50</td>
<td>Coffee/tea break – served in the meeting room</td>
</tr>
<tr>
<td>11:50-13:00</td>
<td>• Review the second set of draft protocols - break out groups B</td>
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<tr>
<td></td>
<td>o Roasting cocoa beans</td>
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<tr>
<td></td>
<td>o Mixing, refining and conching chocolate</td>
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<td></td>
<td>o Chocolate formulation</td>
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<tr>
<td>13:00-14:00</td>
<td>Lunch break</td>
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<tr>
<td>14:00-15:30</td>
<td>• Continuation on review of the second draft protocols – break out groups B</td>
</tr>
<tr>
<td></td>
<td>• Plenary discussion on second set of draft protocols</td>
</tr>
<tr>
<td>15:30-16:00</td>
<td>Coffee/tea break – served in the meeting room</td>
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<tr>
<td>16:00-18:00</td>
<td>• Barry Callebaut chocolate tasting</td>
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<td></td>
<td>• Plenary discussion on second set of draft protocols</td>
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<td></td>
<td>• Recap on strategical issues</td>
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<tr>
<td>19:30</td>
<td><strong>Social dinner</strong></td>
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</tbody>
</table>

**Friday 2 November**

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<tr>
<th>Time</th>
<th>Activities</th>
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<tbody>
<tr>
<td>09:30-13:00</td>
<td>• Recap of previous two days</td>
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<tr>
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<td>• Review of protocol on sensory evaluation of coarse powder – break out groups</td>
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<tr>
<td></td>
<td>• Plenary discussion on reviewed protocol</td>
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<td></td>
<td>• Discussion on strategical issues</td>
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<tr>
<td>13:00-14:00</td>
<td>Lunch break</td>
</tr>
<tr>
<td>14:00-17:15</td>
<td>• Review of protocol on sensory evaluation of cocoa liquor – break out groups</td>
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<td></td>
<td>• Plenary discussion</td>
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<td></td>
<td>• Next steps</td>
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<tr>
<td></td>
<td>• Closing words</td>
</tr>
</tbody>
</table>
## Annex C - List of participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Coralie Veyrac</td>
<td>Barry Callebaut</td>
<td>Belgium</td>
</tr>
<tr>
<td>2. Renata Januszewska</td>
<td>Barry Callebaut</td>
<td>Belgium</td>
</tr>
<tr>
<td>4. Arisa Thamsuaidee</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Belgium</td>
</tr>
<tr>
<td>5. Silvia Araujo de Lima</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>France</td>
</tr>
<tr>
<td>6. Pierre Costet</td>
<td>Valrhona</td>
<td>France</td>
</tr>
<tr>
<td>7. Dolores Alvarado</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Guatemala</td>
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<tr>
<td>8. Brigitte Laliberté</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Italy</td>
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<tr>
<td>9. Chinkee Lim</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Italy</td>
</tr>
<tr>
<td>10. Ines Drouault</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Italy</td>
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<tr>
<td>11. Sue Gonzalez</td>
<td>CoEx - Bioversity /Cocoa of Excellence Programme</td>
<td>Italy</td>
</tr>
<tr>
<td>12. Daphne Braak</td>
<td>CBI - Centre for the Promotion of Imports from Developing Countries</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>13. Erik Plaisier</td>
<td>CBI - Centre for the Promotion of Imports from Developing Countries</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>14. Nubia Martinez</td>
<td>CBI - Centre for the Promotion of Imports from Developing Countries</td>
<td>Peru</td>
</tr>
<tr>
<td>15. Darin Sukha</td>
<td>CRC - Cocoa Research Centre</td>
<td>Trinidad and Tobago</td>
</tr>
<tr>
<td>16. Daniel Domingo</td>
<td>ECOM</td>
<td>USA</td>
</tr>
<tr>
<td>17. Cristina Liberati</td>
<td>EE/CDP - Equal Exchange</td>
<td>USA</td>
</tr>
<tr>
<td>18. Carla Martin</td>
<td>FCCI - Fine Cacao and Chocolate Institute</td>
<td>USA</td>
</tr>
<tr>
<td>19. Jose Lopez Ganem</td>
<td>FCCI - Fine Cacao and Chocolate Institute</td>
<td>USA</td>
</tr>
<tr>
<td>20. John Kehoe</td>
<td>Guittard - Guittard Chocolate</td>
<td>USA</td>
</tr>
<tr>
<td>21. Carolina Aguilar</td>
<td>LWR - Lutheran World Relief</td>
<td>USA</td>
</tr>
<tr>
<td>22. Rick Peyser</td>
<td>LWR - Lutheran World Relief</td>
<td>USA</td>
</tr>
<tr>
<td>23. Siela Maximova</td>
<td>Penn State University</td>
<td>USA</td>
</tr>
<tr>
<td>3. Julien Simonis</td>
<td>Puratos/Belcolade</td>
<td>Belgium</td>
</tr>
<tr>
<td>24. Ed Seguine</td>
<td>Seguine Cacao and Chocolate/Guittard Chocolate</td>
<td>USA</td>
</tr>
<tr>
<td><strong>By conference video call - GoToMeeting</strong></td>
<td></td>
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<tr>
<td>25. Helene Hopfer</td>
<td>Penn State University</td>
<td>USA</td>
</tr>
<tr>
<td>26. Brad Kintzer</td>
<td>TCHO/CDP</td>
<td>USA</td>
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<tr>
<td>27. Juan Francisco Mollinedo</td>
<td>AMACACAO</td>
<td>Guatemala</td>
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