I. WELCOME AND INTRODUCTIONS

Co-chair Arti Arora, of The Coca-Cola Company, opened the meeting, welcomed attendees and led introductions.1

II. ANTIOXIDANT DISCUSSION

a. Expert Review Panel Update

Jim Harnly, Expert Review Panel Chair for Antioxidants, presented the background and decisions to date of the Expert Review Panel (ERP). He expressed the concern of the Antioxidant ERP determining that it was not possible to meet the equivalency requirements as set forth in the Antioxidant SMPR 2011.011. During the 2012 AOAC Annual Meeting, the ERP omitted the equivalency requirement and reviewed two additional antioxidant methods. The ERP advanced one of the methods to move forward for First Action Official Method Status. The ERP recommended that one of the three First Action Methods be adopted for use by the stakeholder panel.

b. Antioxidant Equivalency Discussion

Darryl Sullivan of Covance Laboratories led the discussion on the antioxidant equivalency requirement and the issues presented by the ERP for antioxidants. It was recommended to the stakeholder panel to either remove the clause for equivalency from the SMPR or to select one single method. John Szpylka, the Antioxidant Working Group Chair, presented two newly created concepts for the stakeholder panel discussion. One concept was to identify 2 solutions which would define 2 set points with defined antioxidant activities. All results from any method would then be scaled accordingly to allow better evaluation of results between methods (this follows the octane fuel rating approach). Results from the different methods can then be compared to evaluate method/matrix appropriateness. The other concept was normalization of results to a defined standard. These concepts are in their infancy and feedback was asked to determine if any potential was observed.

1 Appendix A: SPSFAM Attendee List 3-13-2013
A straw poll was taken to reconvene the antioxidant working group to discuss the concept further. The panel displayed mixed interest and the discussions continued.

Ron Prior presented the comparison correlations of the Oxygen Radical Absorbance Capacity (ORAC) and 2, 2-diphenyl-1-picrylhydrazyl (DPPH), and Ferric Reducing Ability of Plasma (FRAP) values. Dr. Prior’s data indicated that it is not possible to use a conversion factor to derive a common antioxidant capacity value using the different methods. It was also discussed that the choice of the oxidant plays a part in the results.

The following recommendations were made to the stakeholder panel.

**Motion:** Motion by Szpylka; Second by Collison for SPSFAM to remove “If there is more than one Official Method adopted, either comparison factors should be provided to provide equivalent results for the same matrices or the scope statement should limit the applicability of the method”, from the applicability in the SMPR.²

**Consensus Demonstrated by:** 15 in favor, 0 opposed and 0 abstentions. Motion passed.

**Motion:** Motion by DeVries; Second by Collison for SPSFAM to approve OMA 2012.04 “Method for the Determination of Antioxidant Activity in Foods and Beverages by Reaction with 2, 2’-diphenyl-1-picrylhydrazyl (DPPH): Collaborative Study” method as a dispute resolution method.

**Consensus Demonstrated by:** 1 in favor, 9 opposed and 3 abstentions. Motion failed.

**Motion:** Motion by Harnly; Second by DeVries for SPSFAM to select a single consensus method.

**Consensus Demonstrated by:** 1 in favor, 10 opposed and 1 abstentions. Motion failed.

**Motion:** Motion by Bhandari; Second by Collison for SPSFAM (ERP) to modify the applicability statement to include the specific matrix of the three (3) available methods and (for the working group) to provide a supplemental instructional guidance document.

**Consensus Demonstrated by:** 8 in favor, 2 opposed and 5 abstentions. Motion passed.

**Action Items:**
1. ERP to evaluate how to implement the modification of the applicability.
2. WG to reconvene to draft supplemental instructional guidance on antioxidant activity.

**III. EXPERT REVIEW PANEL AND WORKING GROUP UPDATES**

**a. Flavanols Expert Review Panel**

Jim Harnly, Expert Review Panel Chair for Flavanols, gave an update of the ERP decisions during the AOAC Annual Meeting. He mentioned that since the ERP did not meet a quorum the ERP will reconvene to review the two remaining methods and the proposed modification to OMA 2012.24 on Thursday, March 14, 2013.

² Appendix B: Revised SMPR for Antioxidants (SMPR 2011.011) Effective March 14, 2013
b. **Ingredients Expert Review Panel**
   Don Gilliland, Expert Review Panel Chair for Ingredients, gave an update of the ERP decisions during the AOAC Annual Meeting. He mentioned that no methods were considered for First Action Official Method status.

c. **Ingredients Working Group**
   Working Group Chair, John Austad updated stakeholders on the Ingredients Working Group activities since September 2012. He discussed that no methods were chosen from the ERP and recommended to the stakeholder panel to revise the currently approved standard method performance requirements (SMPRs) for vitamins A, D, E and K while seeking the input and expertise of ingredient manufacturers and suppliers.

   **Motion:** Motion by Austad; Second by Kasturi for SPSFAM to reconvene the ingredients working group to revise the SMPRs for vitamins A, D, E, and K.

   **Consensus Demonstrated by:** 16 in favor, 0 opposed and 0 abstentions. Motion passed.

   **Action Items:** For stakeholders to contact their ingredient suppliers and to forward their information to AOAC staff for participation on the working group.

d. **St. John’s Wort Working Group (NIH/ODA)**
   Kate Rimmer, in lieu of Working Group chair Shauna Roman, presented to the stakeholders the activities of the St. John’s Wort Working Group. She shared with the stakeholders the draft standard method performance requirements (SMPRs) for St. John’s Wort as recommended from the working group.

   **Motion:** Motion by Rimmer; Second by Harnly for SPSFAM to approve the SMPR for St. John’s Wort as presented by the working group.³

   **Motion Amended** to include “and/or” in the applicability statement before “hyperforins” and before “flavonoids”.

   **Consensus Demonstrated by:** 13 in favor, 0 opposed and 0 abstentions. Motion passed.

e. **Priority Response Working Group**
   Working Group Chair, Dr. Prabhakar Kasturi presented the Priority Response Program to the stakeholders. Scott Coates of AOAC, presented and walked though each step of the program in detail. It was suggested that the AOAC Organizational Affiliates (OA) and contract providers contribute to a fund that is readily available to implement the program so that the Priority Response Team can act accordingly to a crisis. It was also suggested to use the ACS newsletter and social media (i.e., Twitter, Facebook, and LinkedIn) in addition to a List Serve.

   **Motion:** Motion by Kasturi; Second by Trujillo for SPSFAM to approve the Priority Response Program as presented by the working group.⁴

   **Consensus Demonstrated by:** 14 in favor, 1 opposed and 0 abstentions. Motion passed.

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³ Appendix C: Approved SMPR for St. John’s Wort (version 6) Effective March 14, 2013
⁴ Appendix D: Approved Priority Response Program Description and Flow Chart
f. Heavy Metals Working Group

Working Group Chair, Dr. Christopher Smith presented a brief update to the stakeholders on the activities to date of the working group. In addition, the stakeholders were informed of the current call for methods and call for experts for heavy metals. The stakeholders inquired about the next steps of the working group and if speciation will be the next issue this working group will tackle.

**Action Items:** For stakeholders to inform their colleagues and other known experts to submit methods and submit their CVs for consideration of the ERP for Heavy Metals to be held in August, 2013.

g. Cocoa Solids Working Group Updates

Dawn Frazier stated that AOAC is currently in early discussions with chocolate manufactures to potentially start a stakeholder panel. A teleconference is scheduled for April 3, 2013 to discuss the process and hopefully launch a stakeholder panel in June 2013.

IV. NEXT STEPS

Dawn Frazier of AOAC INTERNATIONAL informed the SPSFAM attendees that the ERP and Ingredients Working Group will meet on Thursday, March 14, 2013. The ERP will review the submitted methods for flavanols and the Ingredients Working Group will revise the SMPRs for vitamins A, D, E and K.

V. ADJOURNMENT
Arti Arora, Co-Chair
The Coca Cola Company
Jo Marie Cook
Florida Dept. of Agriculture

Prabhakar Kasturi
PepsiCo

Joe Romano
Waters Corporation

Joseph Zhou
University of Illinois – Chicago

Douglas Abbott
USDA (Retired)
Jonathan DeVries, Sr.
Medallion Labs/General Mills

Marcus Lacorn
R-Biopharm AG

Steve Royce
Agilent Technologies, Inc.

Joyce Zhu
Jamieson Laboratories

Martin Alewijn
RIKILT
Gregory Diachenko
FDA/CFSAN

Kristie Laurvick
US Pharmacopeia

Brian Schaneberg
Starbucks

Karen Andrews
USDA
Nour Eddine Es-Safi
Mohammed V. Adgal
University

Serena Lazzaro
Phenomenex, Inc.

Brooke Schwartz
Brooke Schwartz Consulting

John Austad
Covance Laboratories
Don Gilliland
Abbott Nutrition

Gabe LeBrun
Pace Analytical Services

Katherine Sharpless
NIST

Kanda Balasubramanian
MARS Symbioscience
Qian Graves
FDA-CFSAN

Stephen Lock
AB SCIEX

Li Sheng
EPL Bio Analytical Services

Brad Barrett
AB SCIEX
Keith Griswold
PepsiCo

Bill Mindak
FDA-CFSAN

Christopher Smith
The Coca Cola Company

Seema Bhagwat
USDA-NDL/ARS
Mark Hammersla
NSI Solutions, Inc.

Stephen Missler
Amway

Christopher Snabes
American Proficiency Institute

Sneh Bhandari
Silliker, Inc.
James Harnly
USDA-ARS BHNRC

Melissa Phillips
NIST

Katie Stanley
ADM Co.

Joe Boison
CFIA
Steve Hoelzer
Dupont Nutrition & Health

Tom Phillips
MD Dept. of Agriculture

Darryl Sullivan
Covance Laboratories

Feng Chen
Clemson University
Gregory Hostetler
Perrigo/PBM Nutritional

Curtis Phinney
Sole Proprietorship

John Szpylka
Silliker Laboratories

AOAC Staff
Dr. E. James Bradford
Delia Boyd
Scott Coates
Dawn Frazier
Nora Marshall
Krystyna McIver
Deborah McKenzie
Alicia Meiklejohn
La’Kia Phillips
Tien Milor
Anita Mishra
Robert Rathbone
Gar Reigler

Mara Clarke
PepsiCo
Greg Jaudzems
Nestle USA QAC

Ron Prior
Consultant/Univ. of AR

Socrates Trujillo
US FDA – Office of Food Safety

Robert Clifford
Shimadzu
Ron Johnson
BioMerieux, Inc.

Kelly Reins
Alkemists Laboratories

Wayne Wolf
USDA (Retired)

Mark Coleman
Elanco Animal Health
George Joseph
AsureQuality

Rama Rengarajan
Kellogg Company

Laura Wood
NIST

John Szpylka
Silliker Laboratories

Mark Collison
ADM Co.
Kate Rimmer
NIST

Jinchuan Yang
Waters Corporation

Joyce Zhu
Jamieson Laboratories
Method Name: In Vitro Determination of Total Antioxidant Activity in Foods, Beverages, Food Ingredients, and Dietary Supplements

Approved by: Stakeholder Panel on Strategic Food Analytical Methods (SPSFAM)

Final version date: March 21, 2012 (Revised March 13, 2013)
Effective date: March 14, 2013

1. Applicability:
In vitro methods for determination of total (hydrophilic and lipophilic) antioxidant activity in foods, beverages, food ingredients, and dietary supplements.

2. Analytical Technique:
Any analytical technique that meets the following method performance requirements is acceptable.

3. Definitions:
Antioxidant Activity: The in vitro measurement of the total potential of a food, beverage, ingredient, or dietary supplement to inhibit or delay the oxidation of other compounds. Trolox activity will be used as the baseline unit of measurement to allow comparison between methods.

Limit of Detection (LOD): The minimum concentration of a substance that can be measured and reported with 95% confidence that the antioxidant activity is greater than zero, and is determined from analysis of a low level of an antioxidant in a given matrix containing the antioxidant.

Limit of Quantitation (LOQ): The minimum analyte concentration for which quantitative results may be obtained with 95% confidence.

Repeatability Precision: Variation arising when all efforts are made to keep conditions constant by using the same instrument and operator, and repeating during a short time period. Expressed as the repeatability standard deviation (SDr), or % repeatability relative standard deviation (%RSDr).

Reproducibility: The standard deviation or relative standard deviation calculated from among-laboratory data. Expressed as the reproducibility relative standard deviation (SDR), or %reproducibility relative standard deviation (%RSDR).

Recovery Factor: The fraction or percentage of the analyte that is recovered when the test sample is analyzed using the entire method.
4. Method Performance Requirements

<table>
<thead>
<tr>
<th>Analytical Range</th>
<th>400 – 400,000*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit of Detection (LOD)&lt;sup&gt;1&lt;/sup&gt;</td>
<td>133*</td>
</tr>
<tr>
<td>Limit of Quantitation (LOQ)&lt;sup&gt;2&lt;/sup&gt;</td>
<td>400*</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Repeatability (RSD)&lt;sub&gt;R&lt;/sub&gt;&lt;sup&gt;3&lt;/sup&gt;</th>
<th>400* 8.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200,000* 3.4%</td>
</tr>
<tr>
<td></td>
<td>400,000* 3.1%</td>
</tr>
</tbody>
</table>

| Recovery Factor | 90% - 110% |

<table>
<thead>
<tr>
<th>Reproducibility (RSD)&lt;sub&gt;R&lt;/sub&gt;&lt;sup&gt;4&lt;/sup&gt;</th>
<th>400* 12.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200,000* 5.1%</td>
</tr>
<tr>
<td></td>
<td>400,000* 4.36%</td>
</tr>
</tbody>
</table>

Concentrations apply to a) foods as purchased; b) foods as to be consumed; c) beverages as to be consumed; d) ingredients as purchased; e) supplements as purchased.

*units expressed as μmol trolox equivalents per 100g. Trolox activity will be used as the baseline to allow comparison between methods. Note: the stated ranges may be adjusted based on the mechanics of the analytical method.

Table Notes
1. Limit of Detection (LOD) - The minimum concentration of a substance that can be measured and reported with 95% confidence that the antioxidant activity is greater than zero. In this table, units are expressed as μmol trolox equivalents per 100g. Trolox activity will be used as the baseline to allow comparison between methods. Note: the stated LOQ may be adjusted based on the mechanics of the analytical method.

2. Limit of Quantitation (LOQ) - The level at or above which quantitative results may be obtained with a 95% degree of confidence. In this table, units are expressed as umol Trolox Equivalents per 100g. Trolox activity will be used as the baseline to allow comparison between methods. Note: the stated LOQ may be adjusted based on the mechanics of the analytical method.

3. Expected Repeatability is 2/3 of the Horwitz-predicted %Reproducibility (see footnote 4).

4. Expected Reproducibility is based on the Horwitz equation for the listed concentrations. The Horwitz-predicted %RSD<sub>R</sub> is based on the mass equivalent of one hydrogen and one electron (one hydride equivalent) which is transferred from the sample to the measuring agent. Therefore, for every micromole of Trolox reacted, 1x10<sup>-8</sup> grams of hydride equivalent per gram of sample are transferred. Thus, a unit of measurement factor of 10<sup>-8</sup> was used for calculation using the Horwitz equation. Note: this approach may be adjusted depending on the method measurement system.

5. System suitability tests and/or analytical quality control:
Suitable methods will include blank check samples, and check standards at the lowest point and midrange point of the analytical range, and a protocol to demonstrate suitability.

6. Reference Material(s): Certified reference materials are available and should be used as appropriate.

7. Validation Guidance: Recommended level of validation: Official Methods of Analysis<sup>SM</sup>

8. Maximum Time-To-Result: No maximum time.
Method Name: Determination of hypericins, hyperforins, and flavonoids in St. John’s wort (Hypericum perforatum) and other Hypericum spp.

Approved by: Stakeholder Panel on Strategic Food Analytical Methods (SPSFAM)

Final version date: March 13, 2013
Effective date: March 14, 2013

Intended Use:

1. Applicability: Determination of hypericins, and/or hyperforins, and/or flavonoids¹ in St. John’s wort (Hypericum perforatum) and other Hypericum spp. in powdered extracts, tablets, hard-shell capsules, and liquid alcohol extracts.

2. Analytical Technique:

Any analytical technique(s) that measures the analytes of interest and meets the following method performance requirements is/are acceptable. It is acceptable to have a different analytical method for each class of analytes.

3. Definitions:

Limit of Quantitation (LOQ): The minimum analyte concentration for which quantitative results may be obtained with 95% confidence.

Repeatability: Variation arising when all efforts are made to keep conditions constant by using the same instrument and operator, and repeating during a short time period. Expressed as the repeatability standard deviation (SDᵣ), or % repeatability relative standard deviation (%RSDᵣ).

Reproducibility: The standard deviation or relative standard deviation calculated from among-laboratory data. Expressed as the reproducibility relative standard deviation (SDᵦ) or %reproducibility relative standard deviation (%RSDᵦ).

Recovery: The fraction or percentage of the analyte that is recovered when the test sample is analyzed using the entire method.

¹ According to Herbal Drugs and Phytopharmaceuticals (3rd Edition), the main flavonoids in SJW are hyperoside, rutoside, and the biflavones I3, II8-biapigenin, and amentoflavone. Quercetin is also present. (http://www.ncbi.nlm.nih.gov/pubmed/11842341)
4. Method Performance Requirements:

<table>
<thead>
<tr>
<th>Performance Parameters</th>
<th>Hypericin</th>
<th>Hyperforin</th>
<th>Flavonoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical Range*</td>
<td>0.05% - 1%</td>
<td>0.05% - 10%</td>
<td>0.05% - 10%</td>
</tr>
<tr>
<td>Limit of Quantitation (LOQ)*</td>
<td>≤ 0.02%</td>
<td>≤ 0.02%</td>
<td>≤ 0.02%</td>
</tr>
<tr>
<td>Repeatability (RSD_r)</td>
<td>0.05 to ≤ 1%</td>
<td>≤ 5%</td>
<td>≤ 5%</td>
</tr>
<tr>
<td></td>
<td>1 to ≤ 5%</td>
<td>NA</td>
<td>≤ 3%</td>
</tr>
<tr>
<td></td>
<td>5 to ≤10%</td>
<td>NA</td>
<td>≤ 3%</td>
</tr>
<tr>
<td>Recovery*</td>
<td>0.05 to ≤ 1%</td>
<td>95% – 105%</td>
<td>95% – 105%</td>
</tr>
<tr>
<td></td>
<td>1 to ≤ 5%</td>
<td>NA</td>
<td>97% – 103%</td>
</tr>
<tr>
<td></td>
<td>5 to ≤10%</td>
<td>NA</td>
<td>98% – 102%</td>
</tr>
<tr>
<td>Reproducibility (RSD_R)</td>
<td>0.05 to ≤ 1%</td>
<td>≤ 8%</td>
<td>≤ 8%</td>
</tr>
<tr>
<td></td>
<td>1 to ≤ 5%</td>
<td>NA</td>
<td>≤ 5%</td>
</tr>
<tr>
<td></td>
<td>5 to ≤10%</td>
<td>NA</td>
<td>≤ 4%</td>
</tr>
</tbody>
</table>

*RSD_r calculated as 1.2*PRSD_r where PRSD_r=2C^{-0.15}, where C is the mass fraction of the lower limit of each range, i.e., C = 0.0005 for the 0.05 to < 1% range. PRSD_r is the Predicted Relative Standard Deviation. Information on the PRSD_r can be found in ANNEX D of Appendix F: Guidelines for Standard Method Performance Requirements in the Official methods of Analysis of AOAC INTERNATIONAL, 19th EDITION (2012)

5. System suitability tests and/or analytical quality control:
   Suitable methods will include blank check samples, and check standards at the lowest point and midrange point of the analytical range, and a protocol to demonstrate suitability.

6. Reference Material(s):
   Use an appropriate Certified Reference Material (CRM) where available.

7. Validation Guidance:
   Recommended level of validation: Official Methods of AnalysisSM

8. Maximum Time-To-Result:
   Analysis time must be less than the established stability time of the analytes in solution.
STAKEHOLDER PANEL ON STRATEGIC FOOD ANALYTICAL METHODS
Priority Response Working Group

PRIORITY RESPONSE PROGRAM

Mission: Provide a forum and mechanism to rapidly respond to emerging analytical issues.

Concept:

1. Organizational Affiliate (OA) members agree to maintain a community fund specifically allocated to allow for immediate response to emerging analytical issues.

2. AOAC will maintain and monitor a LISTSERV specifically for the discussion of emerging analytical issues.
   a. The Priority Response LISTSERV is open to all interested parties.
   b. The Priority Response Team (PRT) will monitor the discussion.
   c. Any Priority Response LISTSERV member can propose an action item.

3. The Priority Response Team (PRT) is comprised of three team members and the AOAC Chief Scientific Officer (CSO):
   a. PRT members are elected by the OA representatives at periodic intervals.
   b. Three PRT members will be elected from the OA representatives and/or members of the Stakeholder Panel on Strategic Food Analytical Methods (SPSFAM).
   c. The PRT members are authorized to adopt a proposed action item for further action, meaning PR community funds can be released to the adopted action items for the organization of a working group.
   d. The PRT members are authorized to release funds required for the creation of Standard Method Performance Requirements (SMPRs), Expert Review Panels (ERPs), and activities required for First Action and Final Action Official Method status.
   e. Two-thirds of the PRT members must agree to the adoption of a proposed action item, and to the working group proposed course of action if additional funds are required.
   f. The AOAC CSO is a non-voting facilitator/counselor.

4. The ad hoc working group created for the specific action item will decide the appropriate course of action which may include one or more of the following:
   - Position paper
   - Identify interim method(s)
   - Creation of SMPRs and First Action Official Methods.

5. Action items selected for creation of SMPRs and First Action Official Methods will follow the established expedited AOAC procedures.