Movement Toward Global Harmonization with Standardized Laboratory Test Methods

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Harvey W. Wiley Building
Food and Drug Administration
College Park, MD
Stakeholder Panel Infant Formula Adult Nutritionals - SPIFAN

• Engaged AOAC and major manufacturers to initiate international collaborative.

• Industry-wide representation mobilized and coordinated through the International Formula Council (IFC)

• Recruited a large cross section of key stakeholders from government and private sectors.

- 100+ Stakeholders
- 20+ Countries
- Objective is to establish ISO/Codex dispute methods for complete nutrition label (Vitamins, Minerals, etc.)
Stakeholder Panel Infant Formula Adult Nutritionals - SPIFAN

• Initial Stakeholder Meeting (50+ Stakeholders)
  • September, 2008
  • AOAC International Meeting – Dallas, TX (USA)
• SPIFAN I – IFC/AOAC - April, 2010
  • Establish Voluntary Consensus Standard Method Performance Requirements (SMPR)
  • Provide Suitable Array of Infant and Adult Nutritional Products for Methods Evaluation
  • > 20 “Priority” Nutrients
  • Recommend Methods
  • Translate SMPRs into Consensus Reference Methods
SPIFAN Process

- Working Groups Formed
  - Stakeholder Cross-Section
  - Establish Nutrient Definitions
- Define Standard Method Performance Requirements (SMPRs)
  - Call For Methods
  - Candidate Methods Identified
- Expert Review Panel (ERP)
  - Candidate Methods Reviewed
    - First Action Status Methods Identified
  - Single-Lab Validation/Collaborative Studies Reviewed
  - Methods Identified and Recommended for Multi-Lab Study
Product Matrices

• Method SLV
• Method Multi-Lab Study
• Product Matrices
  • SRM 1849
  • Infant Formulas (6)
    – Infant Formula Powder Milk-Based
    – Infant Formula Ready to Feed Milk-Based *
    – Infant Formula Powder Soy-Based
    – Infant Formula Powder Hydrolysate Milk-Based
    – Infant Formula Powder Hydrolysate Soy-Based
    – Infant Formula Powder Elemental (amino acid-based) *

* Unfortified Products Also Available
Product Matrices

- **Child/Adult Nutritionals**
  - Child Formula Powder *
  - Adult Nutritional Powder Milk Based
  - Adult Nutritional Powder Low Fat
  - Adult Nutritional RTF High Protein *
  - Adult Nutritional RTF High Fat *

* Unfortified Products Available
1. **Applicability:**
Determination of total vitamin D$_2$, vitamin D$_3$ in all forms (powders, ready-to-feed liquids, and liquid concentrates) of infant, adult, and pediatric nutritional formula. For the purpose of this SMPR, vitamin D$_2$ is defined as ergocalciferol (CAS 8017-28-5) and its pre-vitamin isomer; and vitamin D$_3$ is defined as cholecalciferol (CAS 67-97-0) and its pre-vitamin isomer.

1. **Analytical Technique:**

2. **Definitions:**
- Adult/Pediatric Formula
- Infant formula
- Limit of Detection (LOD)
- Limit of Quantitation (LOQ)
- Repeatability
- Reproducibility
- Recovery

**System suitability tests and/or analytical quality control:**

**Reference Method(s):**

**Reference Material(s):** NIST Standard Reference Material® 1849; Infant/Adult Nutritional Formula - or equivalent. The SRM is a milk-based, hybrid infant/adult nutritional powder prepared by a manufacturer of infant formula and adult nutritional products. A unit of SRM 1849 consists of 10 packets, each containing approximately 10 g of material. The certified value of vitamin D3 in NIST 1849 is 0.251 (±0.027) mg/kg of vitamin D3.

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<tr>
<th>Validation Guidance</th>
<th>Maximum Time-To-Signal</th>
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<table>
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<tr>
<th>Analytical range</th>
<th>0.12 to 5.1*</th>
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<tbody>
<tr>
<td>Limit of Detection (LOD)</td>
<td>≤ 0.02*</td>
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<tr>
<td>Limit of Quantitation (LOQ)</td>
<td>≤ 0.12*</td>
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<tr>
<td>Repeatability (RSDᵣ)</td>
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<tr>
<td>0.12*</td>
<td>≤ 15%</td>
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<tr>
<td>1.5*</td>
<td>≤ 11%</td>
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<td>2.5*</td>
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<td>5.1*</td>
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<tr>
<td>Recovery</td>
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<tr>
<td>0.12</td>
<td>80 – 120%</td>
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<tr>
<td>1.5 *</td>
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<td>2.5*</td>
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<tr>
<td>5.1*</td>
<td>90 – 110%</td>
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<td>Reproducibility (RSDᵣ)</td>
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<td>0.12 *</td>
<td>≤ 15%</td>
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<td>2.5*</td>
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<td>3.0*</td>
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<td>4.0*</td>
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<td>5.10*</td>
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Concentrations apply to: a) ‘ready-to-feed” liquids “as is”; b) re-constituted powders (25 g into 200 g of water); and c) liquid concentrates diluted 1:1 by weight.
## SPIFAN I - Priority Nutrient List

1. Vit A, Cis + Trans
2. Vit D, D3/D2 + previtamin
3. Vit E, Total Tocopherol (to distinguish natural and synthetic)
4. Vit K, all-trans
5. B1, Total
6. B2, Total
7. B6, Total
8. Niacin, Total
9. Biotin, Free
10. Folate, Folic acid + metabolin, (including polyglutamyl)
11. Pantothenic Acid
12. Vit B12, Total
13. Vitamin C
14. Inositol, Free + Phosphatidyl
15. Maj/Trace Minerals
16. UTMs (Cr/Mo/Se)
17. Iodine, Total
18. Fatty Acids
19. Choline
20. Nucleotides
21. Carnitine
SPIFAN I - Progress

- **Vitamin A**
  - SMPR: OMA # 2011.003
  - Method: OMA #2012.09 – Multi-Lab

- **Vitamin D**
  - SMPR: OMA # 2011.004
  - Method: OMA #2011.11 – Multi-Lab

- **Vitamin B<sub>12</sub>**
  - SMPR: OMA #2011.005
  - Method: OMA 2011.10 – Multi-Lab

- **Vitamin E**
  - SMPR: OMA #2011.010
  - Method: OMA #2012.10 – Multi-Lab

- **Inositol**
  - SMPR: OMA #2011.07
  - Method: OMA #2011.18 – Multi-Lab

- **Nucleotides**
  - SMPR: OMA #2011.08
  - Method: OMA #2011.20 – Multi-Lab

- **Ultra-Trace Minerals**
  - SMPR: OMA # 2011.09
  - Method: OMA #2011.19 – Multi-Lab
SPIFAN I - Progress

- Folate
  - SMPR: OMA #2011.006

- Iodide
  - SMPR: OMA #2012.008

- Pantothenic Acid
  - SMPR: OMA #2012.009

- Choline
  - SMPR: OMA #2012.013

- Vitamin C
  - SMPR: OMA #2012.012

- Whey/Casein (China)
  - SMPR: OMA #2012.002

- Fatty Acids
  - SMPR: OMA #2012.011
Stakeholder Panel Infant Formula Adult Nutritionals – SPIFAN II

• SPIFAN II – IFC/AOAC
  • 3-year Term
  • Beginning June, 2013
  • Nutrient SMPR Development
  • Identify Candidate Methods
  • Expert Review Panel (ERP)
  • AOAC - Publish Identified Methods
Stakeholder Panel Infant Formula Adult Nutritionals – SPIFAN II

• Nutrient Scope
  • Minerals (Ca, Cu, Fe, Mg, Mn, P, K, Na, Zn)
  • Vitamins - Biotin, B1, B2, Niacin, B6, Vitamin K
  • Amino Acid Profile
  • Oligosaccharides (FOS, GOS)
  • Carotenoids
  • Chloride
  • Fluoride
SPIFAN – International Footprint

• Stakeholders
• Regional Stakeholder Meetings
  • India
    • Vitamin C, Choline Working Groups
  • China
    • SPIFAN Introduction and Update
• AOAC - Thought Leader Advisory Meetings
  • China, India
• ISO
  • TC34 (Food Products)
    • WG14 (Vitamins, Carotenoids, Other)
SPIFAN – Beyond SMPRs

- Establish/Implement a Laboratory Certification/Proficiency Program
- Establish an International Control Sample (where feasible)
- Provide Methods Training
- Maintain Relevance
Thank You