AGENDA

- Carbonated Beverages and Non Carbonated Beverages
- Fruit & Vegetable Juices, Nectars & Beverages (carbonated also)
- Dairy Based Beverages and Other Beverages
- Key Labelling concerns
- Key Analytical discussions for the categories
- EU regulations – An Example of Nutritional Information’s Compliance & Tolerance criteria – review
- Codex – Global Standard approach to Methods of analysis and sampling
- Summary
CARBONATED BEVERAGES

Carbonated Beverages Standards -

2 Different Standards

- Carbonated Water - 145 ppm max caffeine. (Includes Plain Soda also)
- Caffeinated Beverages 145 min -300ppm max Caffeine Rest same as above

One of the most stringent standards in our food regulations.

- Water to be used for beverage IS-14543 quality
- Multi-ingredient finished product based Insecticide residues MRLs vs application of MRLs to commodities mostly, globally.
- Heavy Metals, NOTS & Toxins max limits. Microbiological requirements defined
- Many Labelling restrictions –”Contains Caffeine” (if added caffeine), NRC+ others
NON CARBONATED BEVERAGES

NCB STANDARD-

• New standard recently in place- not carbonated water based beverages

• Many different kinds of products under this category
  • Could be tea based, Sports-electrolyte based drinks, Fruity flavoured beverages, Hydration beverages, Water based flavoured drinks etc

• Water to be used for beverage IS-14543 quality

• Heavy Metals, NOTS and other contaminants limits same as other beverages

• Microbiological standards applicable – Food safety and Pathogens both
## FRUIT & VEGETABLE PRODUCTS

### FRUIT JUICE & VEGETABLE JUICE
- 100% to 90-80% juice content except acidic juices
- Juices need to maintain Bx same as Single strength Juices specified
- Can be Non heat treated (recent amendment) Or Heat treated that is NFC or FC. Fruit juice stds. Under revision
- Need more flexibility for Indian varieties while we harmonize with global stds. Indian variety data for same fruit varying.
- Global stds method of fruit content detection not there?
- Vegetable juice 5% min but many are lower than this value
- Min Single Bx 10 but many like watermelon, coconut, dates are having lower Bx
- Water extracts also there in co (new draft to have provisions)

### FRUIT NECTAR & VEGETABLE NECTAR
- 20-40% Juice content
- Juices need to maintain Bx same as Single strength Juices specified
- Can be Non heat treated (recent amendment) Or Heat treated that is NFC or FC.
- Fruit juice stds. Under revision
- Global stds. method of fruit content detection not there?
- Need more flexibility for Indian varieties while we harmonize with global stds.
- Indian variety data for same fruit varying.
- Currently only has natural flavours allowed not open
- Acidity also a concern.
- Needs to revise std to have nectars operate in mkt today

### FRUIT BEVERAGE
- 10% juice content min (5% Lime Lemon juice)
- Juice beverage can have many ingredients in it usually sweetened
- Bx min should not apply (draft in place)
- Many additives allowed as water based beverage category

### FRUIT & VEGETABLE MIXTURES
- (PROPRIETARY)
- No Provision in JUICE or NECTAR or BEVERAGE stds to mix the 2 juices- F&V
- Min Bx should not apply in case they are done

### CARBONATED FRUIT BEVERAGE
- and

### CARBONATED BEVERAGE WITH FRUIT JUICE
- Min 10% juice (5% for lime & lemon)
- But new standard made - since PMO agenda for juice addition in CSD
- 5-10% juice content (2.5 % lime lemon) lead to introduction of CBFJ std in regulation
- Juice beverages with carbonation
# OTHER BEVERAGES PRODUCTS

<table>
<thead>
<tr>
<th>DAIRY BASED BEVERAGES</th>
<th>ENHANCED WATERS</th>
<th>PURE FLAVOURED PRODUCTS</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary category</td>
<td>Are not Water</td>
<td>Are just flavoured water, mayor may not have sucrose added. Just for hydration with no calories or low calories</td>
<td>Malted Milk Drinks</td>
</tr>
<tr>
<td></td>
<td>These use water of Quality Potable drinking but have nutrients or phytonutrients with health benefits</td>
<td></td>
<td>Malt Based Foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cereal Based Beverages</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Proprietary beverages</td>
</tr>
</tbody>
</table>
KEY LABELLING CONSTRAINTS -
(SPECIFICALLY FOR ARTIFICIAL SWEETENERS & FOOD ADDITIVES)

• Artificial Sweeteners based products restrictions in RGBs – made with safe & permitted sweeteners (as per FSS(FPS&FA) regulations) for two decades

• Artificial Sweeteners limitation thru specific labelling (nowhere in world such restrictions exist; impedes lesser sugar products innovations in category)
  ▪ “Not Recommended for Children” for products containing already approved safe Artificial Sweeteners + other declarations.

• Food Additives multiple/repeat declarations are now being addressed in the upcoming labelling regulation (like colours and flavours to come in Ingredient List line)

• Vended Beverages containing artificial sweeteners restriction being rationalised (new draft)
KEY ANALYTICAL DISCUSSIONS

• Tolerance for Nutritional Analysis – variations
  • Sugar increase during shelf life – natural sugar behaviour in acidic pH
  • Impact on Carbs and Energy due to sugar value increase
  • These are currently determined by analytical + theoretical data as well as produce variability
  • Adoption of EU tolerance limits criteria- see details

• Colour Analysis always throws false positives
  • Added Tartrazine – chromatogram recovers Tartrazine
  • Added Colour Allura red chromatogram discovers Ponceau 4.
  • Chromatographic methods and their accuracy?
  • Lab to Lab variations
  • NABL accreditation, FSSAI approval of Lab vs Methods of Lab
  • Test Methods for reg purpose vs rapid vs empirical and old methods
KEY ANALYTICAL DISCUSSIONS IN F&V AND OTHER BEV STANDARDS

• Microbiology stds release criteria – under review

• Microbiology - sample retesting – not clear?

• Some parameters of microbiology not very practical e.g. Y&M – Frozen concentrates – 100 vs 1000 (if non-thermally processed – but will go under processing after juice/juice beverages made)

• Natural Fruit Sugar vs Added Sucrose needs clarity to ensure no wrong interpretations for consumption of F&V products.

• Variations in Authenticities

• Heavy Metals and contaminants – global vs local
EU REGULATIONS & GUIDANCES - EXAMPLE OF NUTRITIONAL INFORMATION’S COMPLIANCE & TOLERANCE CRITERIA
# EU Regulations - Example of Nutritional Information’s Compliance & Tolerance Criteria

## Table 1: Tolerances for Foods Other than Food Supplements Including Measurement Uncertainty

<table>
<thead>
<tr>
<th>Component</th>
<th>Tolerances for Foods (Includes Uncertainty of Measurement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamins</td>
<td>+50%** -35%</td>
</tr>
<tr>
<td>Minerals</td>
<td>+45% -35%</td>
</tr>
<tr>
<td>Carbohydrate, Sugars, Protein,</td>
<td></td>
</tr>
<tr>
<td>Fibre</td>
<td>&lt;10 g per 100 g: ±2 g</td>
</tr>
<tr>
<td></td>
<td>10-40 g per 100 g: ±20%</td>
</tr>
<tr>
<td></td>
<td>&gt;40 g per 100 g: ±8 g</td>
</tr>
<tr>
<td>Fat</td>
<td>&lt;10 g per 100 g: ±1.5 g</td>
</tr>
<tr>
<td></td>
<td>10-40 g per 100 g: ±20%</td>
</tr>
<tr>
<td></td>
<td>&gt;40 g per 100 g: ±8 g</td>
</tr>
<tr>
<td>Saturates, Mono-unsaturates,</td>
<td></td>
</tr>
<tr>
<td>Polyunsaturates</td>
<td>&lt;4 g per 100 g: ±0.8 g</td>
</tr>
<tr>
<td></td>
<td>≥4 g per 100 g: ±20%</td>
</tr>
<tr>
<td>Sodium</td>
<td>&lt;0.5 g per 100 g: ±0.15 g</td>
</tr>
<tr>
<td></td>
<td>≥0.5 g per 100 g: ±20%</td>
</tr>
<tr>
<td>Salt</td>
<td>&lt;1.25 g per 100 g: ±0.375 g</td>
</tr>
<tr>
<td></td>
<td>≥1.25 g per 100 g: ±20%</td>
</tr>
</tbody>
</table>

** for vitamin C in liquids, higher upper tolerance values could be accepted.
EXAMPLES - IF NO CLAIMS MADE

• If nutrition declaration of sugars of 8.5 g on pack (and no claim made about its sugar content). According to the rounding value can be ranging from 8.45 to 8.54 g sugars /100 g

• Lower tolerance:
  Lower value (8.45) - Lower tolerance for sugars (2 g);
  So; 8.45 – 2 = 6.45 g/100 g;
  Further Apply rounding guidelines to make lower bound tolerance = 6.5 g/100 g

• Upper tolerance:
  Upper value (8.54) + Upper tolerance for sugars (2 g);
  So, 8.54 + 2 = 10.54 g/100 g;
  Further Apply rounding guidelines to make upper bound tolerance = 11 g/100 g

• If official control finds a sugar content:
  • within the range of 6.5 to 11 g/100 g this product is found to be within the tolerance range;
  • between the declared value (8.5 g) and the upper tolerance limit, control of compliance varies
  • that is outside the range of 6.5 to 11 g/100 g, control of compliance varies

• Section on control – gives aspects to be taken into account when the measured value is outside the tolerance for the declared value
# Tolerances If a Claim Is Made

<table>
<thead>
<tr>
<th>Tolerances for foods and food supplements</th>
<th>Side 1 of tolerance (includes uncertainty of measurement to the side specified, + or -)</th>
<th>Side 2 of tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vitamins</strong></td>
<td>+50%**</td>
<td>- measurement uncertainty</td>
</tr>
<tr>
<td><strong>Minerals</strong></td>
<td>+45%</td>
<td>- measurement uncertainty</td>
</tr>
<tr>
<td><strong>Carbohydrates</strong>, <strong>Protein</strong>, <strong>Fibre</strong></td>
<td></td>
<td>- measurement uncertainty</td>
</tr>
<tr>
<td>&lt;10 g per 100 g; 10-40 g per 100 g; &gt;40 g per 100 g</td>
<td>+4g; +40%; +16g</td>
<td>- measurement uncertainty</td>
</tr>
<tr>
<td><strong>Sugars</strong></td>
<td>&lt;10 g per 100 g; 10-40 g per 100 g; &gt;40 g per 100 g</td>
<td>-4g; -40%; -16g</td>
</tr>
<tr>
<td><strong>Fat</strong></td>
<td>&lt;10 g per 100 g; 10-40 g per 100 g; &gt;40 g per 100 g</td>
<td>-3g; -40%; -16g</td>
</tr>
<tr>
<td><strong>Saturates</strong></td>
<td>&lt;4 g per 100 g; &gt;24 g per 100 g</td>
<td>-1.6g; -40%</td>
</tr>
<tr>
<td><strong>Mono-unsaturates</strong>, <strong>Polyunsaturates</strong></td>
<td>&lt;4 g per 100 g; ≥4g per 100 g</td>
<td>+1.6g; +40%</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>&lt;0.5 g per 100 g; ≥0.5 g per 100 g</td>
<td>-0.3g; -40%</td>
</tr>
<tr>
<td><strong>Salt</strong></td>
<td>&lt;1.25 g per 100 g; ≥1.25 g per 100 g</td>
<td>-0.75g; -40%</td>
</tr>
</tbody>
</table>

*Not applicable to sub-categories

** for vitamin C in liquids, higher upper tolerance values could be accepted
A food product with added vitamin C and a claim 'source of vitamin C' that does not contain naturally occurring vitamin C

• Conditions of use for the claim: 15% of daily reference intake (80 mg) per 100 g = 12 mg vitamin C/100 g

• Nutrition declaration of the product: vitamin C: 12 mg/100 g

• According to the rounding rules value = 11.5 to 12.4 mg vitamin C/100 g

Case 1) Official control finds a vitamin C content of 9.6 mg/100 g - MU = ±1.92 mg/100 g (a specific measurement uncertainty of 20% is assumed for this analysis): 9.6 + 1.92 = 11.52; this product is found to be within the tolerance range criteria laid down

Case 2) Official control finds a vitamin C content of 9.5 mg ± 1.9 mg/100 g – MU = 20 %: the value is outside the lower tolerance range criteria.

Case 3) Official control finds a vitamin C content of 17 mg/100 g which is within the upper tolerance range; the upper tolerance = upper value (here 12.4 mg) + the upper tolerance for vitamin C from table 3 which is 50%; (50 % of 12.4 = 6.2); 12.4 + 6.2 = 18.6 mg/100 g and rounding off the upper bound tolerance will be 19 mg/100 g

Case 4) Official control finds a vitamin C content of 23 mg/100 g which is outside the upper tolerance range.
CODEX — GLOBAL STANDARD APPROACH TO MOA&S

Purpose of Codex Methods of Analysis

The methods are primarily intended as international methods for the verification of provisions in Codex standards. They should be used for reference, in calibration of methods in use or introduced for routine examination and control purposes.

Methods of Analysis

Definition of types of methods of analysis

(a) Defining Methods (Type I)

Definition: A method which determines a value that can only be arrived at in terms of the method per se and serves by definition as the only method for establishing the accepted value of the item measured.

Examples: Howard Mould Count, Reichert-Meissl value, loss on drying, salt in brine by density.

(b) Reference Methods (Type II)

Definition: A Type II method is the one designated Reference Method where Type I methods do not apply. It should be selected from Type III methods (as defined below). It should be recommended for use in cases of dispute and for calibration purposes.

Example: Potentiometric method for halides.

(c) Alternative Approved Methods (Type III)

Definition: A Type III Method is one which meets the criteria required by the Codex Committee on Methods of Analysis and Sampling for methods that may be used for control, inspection or regulatory purposes.

Example: Volhard Method or Mohr Method for chlorides

(d) Tentative Method (Type IV)

Definition: A Type IV Method is a method which has been used traditionally or else has been recently introduced but for which the criteria required for acceptance by the Codex Committee on Methods of Analysis and Sampling have not yet been determined.

Examples: chlorine by X-ray fluorescence, estimation of synthetic colours in foods.

General Criteria for the Selection of Methods of Analysis

(a) Official methods of analysis elaborated by international organizations occupying themselves with a food or group of foods should be preferred.

(b) Preference should be given to methods of analysis the reliability of which have been established in respect of the following criteria, selected as appropriate:

(i) selectivity

(ii) accuracy

(iii) precision, repeatability (within laboratory), reproducibility (inter-laboratory (within laboratory and between laboratories))

(iv) limit of detection

(v) sensitivity

(vi) practicability and applicability under normal laboratory conditions

(vii) other criteria which may be selected as required.

(c) The method selected should be chosen on the basis of practicability and preference should be given to methods which have applicability for routine use.

(d) All proposed methods of analysis must have direct pertinence to the Codex Standard to which they are directed.

(e) Methods of analysis which are applicable uniformly to various groups of commodities should be given preference over methods which apply only to individual commodities.

General Criteria for the Selection of Methods of Analysis using the Criteria Approach

In the case of Codex Type II and Type III methods, method criteria may be identified and values quantified for incorporation into the appropriate Codex commodity standard. Method criteria which are developed will include the criteria in section Methods of Analysis, paragraph (c) above together with other appropriate criteria, e.g. recovery factors.
**CODEX — GLOBAL STANDARD APPROACH TO MOA&S**

<table>
<thead>
<tr>
<th>Table 1: Guidelines for establishing numeric values for the criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applicability:</strong></td>
</tr>
<tr>
<td><strong>Minimum applicable range:</strong></td>
</tr>
<tr>
<td><strong>Limit of Detection (LOD):</strong></td>
</tr>
<tr>
<td><strong>Precision:</strong></td>
</tr>
<tr>
<td><strong>Recovery (R):</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>≥1</td>
</tr>
<tr>
<td>0.1</td>
</tr>
<tr>
<td>0.01</td>
</tr>
<tr>
<td>0.001</td>
</tr>
<tr>
<td>0.0001</td>
</tr>
<tr>
<td>0.00001</td>
</tr>
<tr>
<td>0.000001</td>
</tr>
<tr>
<td>0.0000001</td>
</tr>
<tr>
<td><strong>Trueness:</strong></td>
</tr>
</tbody>
</table>

The criteria in Table 1 must be approved for the determination in question.

However, the primary responsibility for supplying information about the specified Codex level(s), methods of analysis and criteria resides with the referring Committee. If the Committee fails to provide a method of analysis or criteria despite numerous requests, then the COOAS may establish equivalent criteria as shown.
SUMMARY

Beverage stds need modernisation for innovations especially removal of archaic Labelling norms and adoption of international norms

Beverage stds parameters needs upgradations - some to be removed, some changed based on global practices

Many methods need Tolerance and compliance criteria’s – Example Nutritional Information where EU is a great reference point .

Methods of manuals of analysis need constant upgradation especially regulatory purpose methods -Codex guidance's should be a key reference for same

Regulatory Rapid testing kits give speed, scale and accuracies to help both FBOs and regulators – Also need recognition as per global practices.
THANKS