Canadian health professionals’ understanding of sugar’s functional roles in foods

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Canadian Sugar Institute Nutrition Information Service

- Inform and educate Canadians about sugars and healthy eating and advocate for science-based nutrition policies

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Sugars and Health
the Current Science
Background: Media Perception

- The presence of sugar (sucrose) in food products has garnered both media attention and calls from health groups for reformulation to reduce the added sugar content of foods.

Sugar Is Just Empty Calories—but That’s the Whole Problem

Sugar makes you fat - and it may be killing you

As Canadians we are eating too much ‘added sugar.’ Sugar gives us energy but not much else. Consuming too much sugar puts us at risk for heart disease, stroke, obesity, diabetes, high blood cholesterol, cancer and of course cavities.

Eating Sugar Causes Massive Health Problems, Says WHO
Background: Functional Properties of Sugar in Foods

- However, sugar contributes important sensory, microbial, chemical and structural properties to foods, in addition to providing sweetness.

<table>
<thead>
<tr>
<th>Sensory</th>
<th>• Sweetness</th>
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<tbody>
<tr>
<td></td>
<td>• Flavour perception</td>
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<tr>
<td></td>
<td>• Flavour enhancement</td>
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<thead>
<tr>
<th>Microbial</th>
<th>• Preservation</th>
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<tbody>
<tr>
<td></td>
<td>• Fermentation</td>
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<thead>
<tr>
<th>Chemical</th>
<th>• Caramelization</th>
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<tbody>
<tr>
<td></td>
<td>• Maillard browning</td>
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<tr>
<th>Physical</th>
<th>• Crystallization</th>
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<tr>
<td></td>
<td>• Boiling point (temperature) increases</td>
</tr>
<tr>
<td></td>
<td>• Freezing point depression</td>
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<td></td>
<td>• Texture and Appearance</td>
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The objective of this study was to:

- Assess health professionals’ knowledge regarding the functional roles of sugar in foods; and
- Identify knowledge gaps.
Methods

- Questionnaires voluntarily completed by health professionals at two Dietitians of Canada conferences and the International Diabetes Federation conference in 2015
- A total of 377 health professionals completed surveys
- Questionnaires included five questions on topics pertaining to functional roles of sugar in different types of foods
- Microsoft Office Excel 2013 was used to conduct data analysis.
Results: Participants’ Area of Practice

Total n=377

- Dietitians: 40% (47.4%)
- Academics/Researchers: 5% (5.9%)
- Medical doctors: 15% (17.3%)
- Nurses: 10% (11.8%)
- Pharmacists: 3% (3.5%)
- Dentists: 1% (1.1%)
- Educators: 1% (1.1%)
- Students: 1% (1.1%)
- Other: 4% (4.7%)

Note: Percentages in parentheses indicate the actual percentages based on the sample size.
Q1. In baked foods, which of the following features is/are linked to the use of sugar (sucrose)? Check all that apply.

- Flavour
- Longer shelf life
- Proper rise of the dough
- Yellow-brown colour

Results: Roles of Sugar in Baked Goods

<table>
<thead>
<tr>
<th>Flavour</th>
<th>Longer shelf life</th>
<th>Proper rise of the dough</th>
<th>Yellow-brown colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>61%</td>
<td>43%</td>
<td>41%</td>
<td>57%</td>
</tr>
</tbody>
</table>
Results: Lesser Known Roles of Sugar in Baked Goods

**DID YOU KNOW?**

Sugar is very important in bread making, working with yeast to make bread rise.

**DID YOU KNOW?**

Sugar acts as an important tenderizing agent and is responsible for the pleasant golden-brown colour of baked products.
Results: Roles of Sugar in Tomato-Based Sauces

2. Sugar is added to tomato-based sauces (e.g. BBQ sauce) to _______. Check all that apply.

- Balance the natural acidity of tomatoes
- Heighten the tomato flavour
- Improve consistency
- Contribute to the browning process

Frequency of selecting each functional role:

- Balance the natural acidity of tomatoes: 63%
- Heighten the tomato flavour: 48%
- Improve consistency: 36%
- Contribute to the browning process: 35%
3. In ready-to-eat breakfast cereals, which of the following features is/are linked to the use of sugar (sucrose)? Check all that apply.

- Flavour
- Improved surface porosity
- Increased crispness
- Longer shelf life

![Graph showing frequency of selecting each functional role.](image)
4. In sugar-free products, the consistency/texture is usually maintained by replacing sugar with which of the following ingredients? Check all that apply.

- Starches
- Gelatin
- Polydextrose
- Vegetable oils

![Bar chart showing the percentage of correct answers for each question.]

- All: 5% (Right), 3% (Wrong)
- Three: 3% (Right)
- Two: 17% (Wrong)
- One: 70% (Wrong)

Results: Sugar Replacements for Texture
To reduce sugar but still maintain a product’s consistency and texture, other Caloric ingredients (e.g. starches, polydextrose, gelatin) are often added, which may not reduce the total energy content of the foods.

<table>
<thead>
<tr>
<th>Function</th>
<th>Replacement ingredients</th>
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<tbody>
<tr>
<td>Sweetness</td>
<td>High intensity sweeteners, polyols (xylitol)</td>
</tr>
<tr>
<td>Mouthfeel/texture</td>
<td>Hydrocolloids (gums, starch, gelatin), polyols, sugars</td>
</tr>
<tr>
<td>Flavour</td>
<td>Flavours (additives)</td>
</tr>
<tr>
<td>Preservation</td>
<td>Preservatives (additives)</td>
</tr>
<tr>
<td>Colour</td>
<td>Colours (additives)</td>
</tr>
<tr>
<td>Structure</td>
<td>Bulking agents (starches, maltodextrin), polyols, fibres (inulin)</td>
</tr>
</tbody>
</table>
5. Please indicate how much you agree with the following statement:
Products with the claim “Reduced In Sugar” are lower in Calories compared to the products not “Reduced In Sugar”.

![Bar chart showing responses]

- 31% Agree Completely
- 30% Agree Somewhat
- 9% Neither Agree or Disagree
- 19% Disagree Somewhat
- 12% Disagree Completely

**Food Drug Regulation B.01.513:**
**Reduced in Sugar Claim:** The food is modified to contain at least 25% less sugars, totalling at least 5 g less than the standard product per reference amount, or per 100 grams.
“Reduced in Sugar” ≠ “Reduced in Calories”

Original Vanilla Ice Cream

Ingredients:
Cream, Modified Milk Ingredients, Sugar, Glucose, Mono and Diglycerides, Locust Bean Gum, Cellulose Gum, Guar Gum, Carrageenan, Dextrose, Natural Flavour.

No Sugar Added Ice Cream

Ingredients:
Modified Milk Ingredients, Cream, Maltitol Syrup, Skim Milk Powder, Mono and Diglycerides, Guar Gum, Locust Bean Gum, Cellulose Gum, Carrageenan, Natural Flavour, Sucralose, Lactase.

Sweetened with Maltitol and Sucralose.
Conclusions

- This survey revealed knowledge gaps in health professionals’ understanding of sugar’s functional roles in foods.
  - Flavour was the most frequently known function for each category.
  - While almost half (40%) of respondents recognized products with the claim “reduced in sugar” are not always lower in Calories compared to products not “reduced in sugar”, very few (3%) could correctly identify the three major Caloric replacement ingredients.
Conclusions

• 2016 CSI projects have focused on developing innovative and interactive resources to help address knowledge gaps and support health professionals communicate science-based nutrition information related to sugars to the media and the public.
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