Notice of Modification to the *List of Permitted Food Enzymes* to Enable the Use of Hexose Oxidase from *Hansenula polymorpha* (B13-HOX4-Mut45) as a Food Enzyme in Certain Cheese, Bakery and Milk Products

Notice of Modification – *Lists of Permitted Food Additives*
Reference Number: [NOM/ADM-0010]

June 4, 2013
notice of modification to the list of permitted food enzymes to enable the use of hexose oxidase from Hansenula polymorpha (B13-HOX4-Mut45) as a food enzyme in certain cheese, bakery and milk products

summary

Food additives are regulated in Canada under Marketing Authorizations (MAs) issued by the Minister of Health and the Food and Drug Regulations. Approved food additives and their permitted conditions of use are set out in the Lists of Permitted Food Additives that are incorporated by reference in the MAs. A petitioner can request that Health Canada approve a new additive or a new condition of use for an already approved food additive by filing a food additive submission with the Department's Food Directorate. Health Canada uses this premarket approval process to determine whether the scientific data support the safety of food additives when used under specified conditions in foods sold in Canada.

Health Canada received a food additive submission seeking approval for the use of hexose oxidase as a food enzyme at a maximum level of use in accordance with good manufacturing practice in the manufacture of pizza mozzarella cheese, part-skim pizza mozzarella cheese, ultra-heat treated (UHT) milk, and dough for bread, baking and pasta.

The results of Health Canada’s evaluation of available scientific data support the safety and efficacy of hexose oxidase when used as set out in the table below. Since this is a food additive that was not previously permitted for use in Canada, Health Canada published its proposal, entitled, Information and Consultation Document on Health Canada's Proposal to Enable the use of the Food Additive 'Hexose Oxidase' in pizza mozzarella cheese, part-skim pizza mozzarella cheese, ultra-heat treated milk, and dough for bread, baking and pasta, in November 2012, requesting comments. One comment was received during the consultation, in which no objection to the proposal was expressed. Given that no new scientific information was submitted to the Department during the consultation, and since the conclusions of the evaluation remain as proposed, Health Canada has modified the List of Permitted Food Enzymes as indicated in the table below.

Health Canada’s proposal identified the potential need for modifying the regulatory standards for the standardized foods that are covered by the proposal. It has since been determined that such modification will not be required at this time in order to enable the use of hexose oxidase.

modification to the List of Permitted Food Enzymes

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Column 1 Additive</th>
<th>Column 2 Permitted Source</th>
<th>Column 3 Permitted in or upon</th>
<th>Column 4 Maximum Level of Use and Other Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.2</td>
<td>Hexose oxidase</td>
<td>Hansenula polymorpha</td>
<td>(1) Bread; Flour; Whole wheat flour</td>
<td>(1) Good Manufacturing Practice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(B13-HOX4-Mut45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2) Unstandardized bakery products</td>
<td>(2) Good Manufacturing Practice</td>
</tr>
</tbody>
</table>
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<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(3)</td>
<td>Milk, partly skimmed milk, skim milk and sterilized milk, heat-treated to at least 100°C</td>
<td>(3) Good Manufacturing Practice</td>
</tr>
<tr>
<td>(4)</td>
<td>Part skim pizza mozzarella cheese; Pizza mozzarella cheese</td>
<td>(4) Good Manufacturing Practice</td>
</tr>
</tbody>
</table>

**Rationale**

Health Canada’s Food Directorate completed a pre-market safety and efficacy assessment of hexose oxidase obtained from the genetically-modified production organism, *Hansenula polymorpha* (B13-HOX4-Mut45). This strain expresses a gene from the alga *Chondrus crispus* (Irish moss or carrageenan seaweed) that encodes hexose oxidase. The assessment considered chemical, microbiological, toxicological, and technical aspects of hexose oxidase when used as requested in the food additive submission.

A safety evaluation of the potential exposure to lauryl trimethyl ammonium bromide, which is used in the extraction of the enzymes from the production organism, was also conducted.

Based on the results of the safety assessment, Health Canada’s Food Directorate considers that the data support the safety of hexose oxidase from *Hansenula polymorpha* (B13-HOX4-Mut45) when used under the conditions of use set out in the table above. The Department has therefore enabled the use of hexose oxidase as described in the table above.

**Other Relevant Information**

Since the food additive submission requested the use of hexose oxidase in foods that are standardized under the *Food and Drug Regulations*, the Canadian Food Inspection Agency (Dairy Program) and the appropriate food industry associations were consulted.

- The food industry associations consulted expressed their support of the proposal to legally permit the use of hexose oxidase.

The Canadian Food Inspection Agency had no objections to the use of hexose oxidase in pizza mozzarella cheese, part-skim pizza mozzarella cheese, UHT milk, and dough for bread, baking and pasta. It was also noted that the *Dairy Products Regulations* (Canada *Agricultural Products Act*) list "part skim pizza mozzarella" and "pizza mozzarella" as varieties of cheese in section 28.1, the table to which specifies maximum percentage of moisture and minimum percentage of milk fat for a large variety of different cheeses.
Regarding its status in other countries, hexose oxidase has GRAS (Generally Recognized as Safe) status for use in foods in the United States of America. It is considered acceptable for use in foods in Denmark, in accordance with the guidelines for the former Scientific Committee for Food of the Commission of the European Communities. Hexose oxidase is listed as a processing aid in the Food Standards Code of Australia and New Zealand.

Internationally, it is listed in the Inventory of Processing Aids of the Codex Committee on Food Additives. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) has specifications for hexose oxidase from *Chondrus crispus* expressed in *Hansenula polymorpha*. These specifications were prepared at the 63rd meeting of JECFA in 2004, at which time an acceptable daily intake of “not specified” was established. This designation is assigned to substances that have a very low toxicity and, on the basis of available data and the total dietary intake, do not pose a health hazard.

**Notification – Summary of Comments**

In response to Health Canada’s *Information and Consultation Document on Health Canada’s Proposal to Enable the use of the Food Additive ‘Hexose Oxidase’ in pizza mozzarella cheese, part-skim pizza mozzarella cheese, ultra-heat treated milk, and dough for bread, baking and pasta*, published in November 2012, only one comment was received, in which no objection to the proposal was expressed, and no new scientific information was submitted.

**Implementation and Enforcement**

The above modification came into force June 4, 2013, the day it was published in the *List of Permitted Food Enzymes*.

The Canadian Food Inspection Agency is responsible for the enforcement of the *Food and Drugs Act* and its associated regulations with respect to foods.

**Contact Information**

Health Canada's Food Directorate is committed to reviewing any new scientific information on the safety in use of any food additive, including hexose oxidase. Anyone wishing to submit new scientific information on the use of this additive or to submit any inquiries may do so in writing, by regular mail or electronically. If you wish to contact the Food Directorate electronically, please use the words "hexose oxidase" in the subject line of your e-mail.

Bureau of Chemical Safety  
251 Sir Frederick Banting Driveway  
Tunney’s Pasture, PL: 2202C  
Ottawa, Ontario K1A 0L2  
E-mail: bcs-bipc@hc-sc.gc.ca