

MEASUREMENT OF TOTAL SUGARS IN MOLASSES AND REFINED SYRUPS BY LUFF SCHOORL

The Expertise Centre CCC (Eurofins Food & Feed Testing, The Netherlands) is proud to announce the availability of the analyses of total (reducing) sugars in molasses as a validated and accredited routine test accredited according to ISO 17025. The method is conform United Molasses UM section F2 1992 and ICUMSA GS4/3-9 and available with the test codes HEC6C (as sucrose) and HEC6F (as glucose).

Introduction

Molasses or black treacle for human consumption, is a viscous product resulting from refining sugar cane or sugar beets into sugar. Molasses varies by amount of sugar, method of extraction and plant age. Sugarcane molasses is agreeable in taste and aroma, and primarily used for sweetening and flavoring foods, while sugar beet molasses is foul-smelling and unpalatable, mainly used as an animal feed additive in Europe and Russia, where it is chiefly produced. Molasses is a defining component of fine commercial brown sugar.

Sugars are key components in the human and animal diet. They provide a desirable energy source, but at high dietary levels have been associated with undesirable effects on health and blood glucose levels. They are nutritionally and compositionally distinct from other carbohydrates such as starch, fructan, and dietary fiber.

Molasses contain ~22% water and 75% carbohydrates, and no protein or fat. Molasses is a rich source (>20% of the Daily Value) of nutritional components. Unlike refined sugars, this viscous residual syrup contains substances, such as trace amounts of vitamins and several important minerals, that provide your body with vital health benefits. The sugars in molasses are sucrose (~29% of total carbohydrates), glucose (~12%) and fructose (~13%).

Regulations

The WHO recommends to limit sugar consumption to <10% of daily calories. The nutrition labels on food products need to specify the amount of total carbohydrates and sugars. In foods mono- and di-saccharides are expected, mainly glucose, fructose, galactose, sucrose and maltose. In feed other sugars may be present. Correct nutrition labeling of total sugars in products is mandatory from EC legislation (EU 1169/2011 and 90/496/EEC) and various other authorities, e.g. FDA. Claims like Sugar

Free, Low or Reduced/Less are also regulated by law. Various countries regulate import/export of molasses. Methods are described by United Molasses or ICUMSA methods. The EC fixes the representative prices and the additional import duties for molasses in the sugar sector.



Method & Principle

The sugars are extracted with demi-water and, after weak inversion, are determined using the Luff-Schoorl method. The method lacks selectivity for products containing significant amounts of other reducing components. Reducing sugars in molasses are primarily equimolar amounts of glucose and fructose (invert sugar), but not exclusively. The limit of quantification is 0.3% (m/m).

The method is conform UM method section F2 1992 and ICUMSA GS4/3-9.

Applications & Use

The test method is developed for the determination of total reducing sugars after hydrolyses in molasses and is also applicable to refined syrups or vinasse, expressed as glucose. The method can be used to determine sucrose including invert sugar in syrups, by recalculating the total reducing sugars as glucose multiplied by a factor 0.95.

Applications of molasses

Molasses, including vinasses, can be used:

- In dark rye breads or other whole grain breads
- In some cookies and pies
- In gingerbread
- In barbecue sauces
- In beer styles such as stouts and porters
- To stabilize emulsification of home-made vinaigrette
- As the principal ingredient in the distillation of rum
- As a humectant in jerky processing
- As an iron supplement
- As an additive in livestock feeds
- As an ingredient in fishing ground bait
- As source for yeast production
- As the main ingredient in the production of citric acid
- As an additive in tobacco smoked in a hookah, shisha, or narghile
- Are further processed by fermentation to ethanol, ascorbic acid or other products

Our tests at a glance

Test code	Matrix	Analytical method (Luff Schoorl)
HEC6C*	Molasses & syrups	Expressed as sucrose
HEC6F *	Molasses & syrups	Expressed as glucose

* Performed conform UM section F2 1992 and ICUMSA GS4/3-9 and is accredited

Contact us

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