

# MEASUREMENT OF TOTAL SUGARS BY LUFF SCHOORL FOR FOOD, FEED AND PET FOOD

The Expertise Centre CCC (Eurofins Food & Feed Testing, The Netherlands) is proud to announce the availability of the analyses of total sugars as a validated routine test accredited according to ISO 17025 for food, feed and pet food matrices. The method is based on EG 152.2009, GAFTA 10:1, ICUMSA GS8-5 & NEN 3571 and available with test codes HEC6A (Food) & HEC6B (Feed) (as glucose) and HEC6E (Food) & HEC6D (Feed) (as sucrose).

## Introduction

Sugars are key components in the human and animal diet. They provide a desirable energy source, but at high dietary levels are associated with undesirable effects on health and blood glucose levels. They are nutritionally and compositionally distinct from carbohydrates such as starch, fructan and dietary fiber. Sugars are found in products like bakery, beans, pasta, dairy, potatoes and soft drinks as well as feed and pet food, like sugar cane, cereals, fish feed and dog treats.

AAFCO definition (Feed) - Sugars (Nutrient) are the sum of all free di- and monosaccharides, such as sucrose, glucose or others, digestible by enzymes found in an animal's digestive tract.

FDA definition (Food) - Sugars are the smallest and simplest carbohydrates. They are easily digested and absorbed by the body. There are two types of sugars, monosaccharides and disaccharides and most foods contain some of each kind. In the EC definition 'Sugars' means all mono- and disaccharides present in food, but excludes polyols, isomaltulose and tagatose.

## Regulations

The WHO recommends to limit sugar consumption to <10% of daily calories. Nutrition labels need to specify the amount of total sugars present. In foods mono- and disaccharides are found, mainly lactose, glucose, fructose, galactose, sucrose and maltose. In feed other sugars may be present. Correct labeling of sugars in products is mandatory from EC legislation (EU1169/2011 & 90/496/EEC) and other authorities, e.g. FDA. Claims like Sugar Free, Low or Reduced/Less are regulated by law.

According to the FAO (the UN Feed & Agricultural Organization) quality control in the feed industry involves the verification of quality established for each feed ingredient, including the close monitoring during the period of storage prior to usage and processing. Commission Regula-

tions (EC152/2009 and preceding 71/250/EEC (L155/29-32 WM7)) lay down the methods of sampling and analysis for the official control of feed products. For the protection of animal and public health it is important that feed and pet food is covered by the above Regulations as prescribed by the Federation Dutch Feed chains (FND *form.* Product Board Animal feed, PDV).

## Method & Principle



CCC adapted the official standards for animal feed products making the tests suitable for human food as well. The sugars are extracted with aqueous ethanol. The solution is clarified and the sugars are determined before and after inversion by the Luff-Schoorl method. The method lacks selectivity for products containing significant amounts of fructans, galacto-oligosaccharides, polydextrose, maltodextrins, raffinose and maltitol. Other reducing components may be included in the result. Prebiotics (e.g. inulin/FOS) can be erroneously determined as digestible sugars. The limit of detection is 0.2% (m/m).

## Applications & Use

The test method is developed for the determination of sugars expressed as glucose in feeding stuffs but also suitable for food matrices. Data can also be reported as sucrose

## Food: Feed versus Human Food definition

Food is any substance consumed to provide nutritional support for an organism. It is usually of plant or animal origin, and contains essential nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals. The substance is ingested by an organism and assimilated by the organism's cells to provide energy, maintain life, or stimulate growth.

Human Food: Material consumed or intended to be consumed by (adult) humans.

Feed (acc. [AAFCO](#)) is material consumed or intended to be consumed by animals other than humans that contributes nutrition, taste, or aroma or has a technical effect on the consumed material. This includes raw materials, ingredients, and finished product. Animal Food: See feed. FDA refers to AAFCO for definition: A feed ingredient is a component part or constituent or any combination/mixture added to and comprising the feed. Feed ingredients might include grains, milling byproducts, added vitamins, minerals, fats/oils, and other nutritional and energy sources. The Official Publication of the Association of American Feed Control Officials (AAFCO) contains the most complete list of feed ingredients with their definitions.

### Our tests at a glance

Test code	Matrix	Analytical method (Luff Schoorl)
HEC6A* (as glu) HEC6E* (as suc)	Food*	In house method of which titration is performed conform EG152/2009 App. III-J (L54/42), GAFTA (Form130) method 10:1, NEN3571 & ICUMSA method GS8-5 †
HEC6B* (as glu) HEC6D* (as suc)	Feed / Pet food	Conform EG 152 and GAFTA method 10:1#

† The extraction is performed as an in-house method based on EG 152 and GAFTA method 10:1. The weak inversion is performed as an in-house method based on EG 152 and GAFTA method 10:1. The Luff Schoorl titration is performed conform EG152, GAFTA method 10:1, NEN3571 and ICUMSA method GS8-5.

# The extraction is performed conform EG 152 and GAFTA method 10:1. The weak inversion is performed conform EG 152 and GAFTA method 10:1. The Luff Schoorl titration is performed conform EG152, GAFTA method 10:1, NEN3571 and ICUMSA method GS8-5.

\* Accredited test

### Contact us

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