

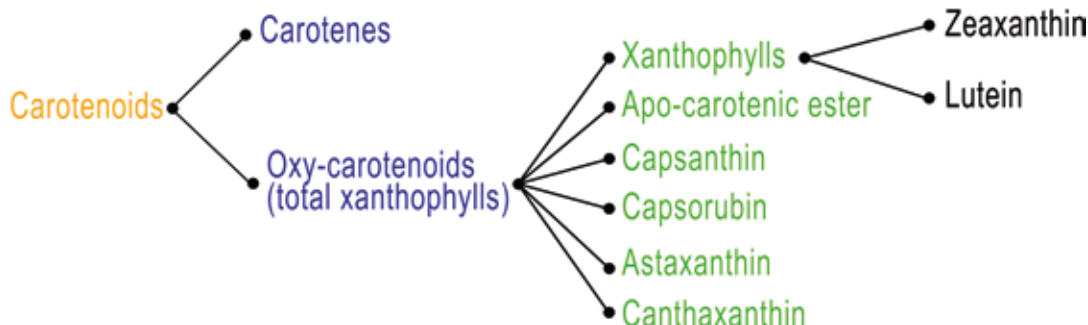
Carotenoids in foodstuffs

By Eurofins Steins, Vitamin Competence Centre, Denmark

Carotenoids are a class of natural fat-soluble pigments found principally in plants, algae, and photosynthetic bacteria.

They are responsible for many of the red, orange, and yellow hues of plant leaves, fruits, and flowers, as well as the colours of fish and crustaceans. Some familiar examples of carotenoid colouration are the orange of carrots and citrus fruits, the reds of peppers and tomatoes, and the pink of salmon.

Carotenoids Overview



In human nutrition, carotenoids participate in several important processes.

The most widely studied and understood role is their provitamin A activity. They play an important role by acting as biological antioxidants, protecting cells and tissues from the damaging effects of free radicals. They also enhance the immune system function, protect from sunburn, and may inhibit the development of certain types of cancers.

Carotenoids in foodstuffs

Carotenoids are used in the food and animal feed industry, for instance in feed for laying hens and farmed salmon and trout. Those of interest in egg yolks are the xanthophylls (lutein, zeaxanthin) and cantaxanthin.

- Lutein and zeaxanthin give a yellowish colour to food. They are normally derived from feed ingredients such as maize and alfalfa.

- Cantaxanthin (E 161 g) is used to add a more reddish colour to food. It is mainly of synthetic origin.

- Astaxanthin is widely used as a colourant in salmon and trout farming where it gives an orange colour to their flesh. It can be of natural and synthetic origin.

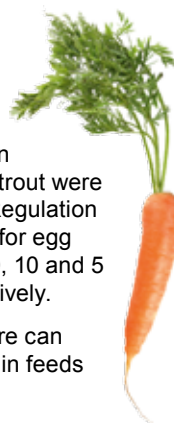
Why analyse for carotenoids?

The carotenoids are very unstable compounds due to fact that they act as antioxidants, so their content in feed and food needs to be monitored to ensure compliance with any claims on the label.

Under EU law they are regulated as food additives. Cantaxanthine is known to cause liver injury when present in high concentrations and cause a yellow colour to the eye retina. The addition of cantaxanthine is regulated in EU Commission Directive 2003/7/EC with a maximum of 8 mg/kg for complete feeding stuffs for laying hens. Maximum residue limits for cantaxanthin in poultry, eggs, salmon and trout were established in Commission Regulation EC No 775/2008. The limits for egg yolk, salmon and trout are 30, 10 and 5 mg/kg of fresh tissue respectively.

Eurofins Steins Vitamin Centre can determine these carotenoids in feeds and foods.

Contact: vitamin@eurofins.dk

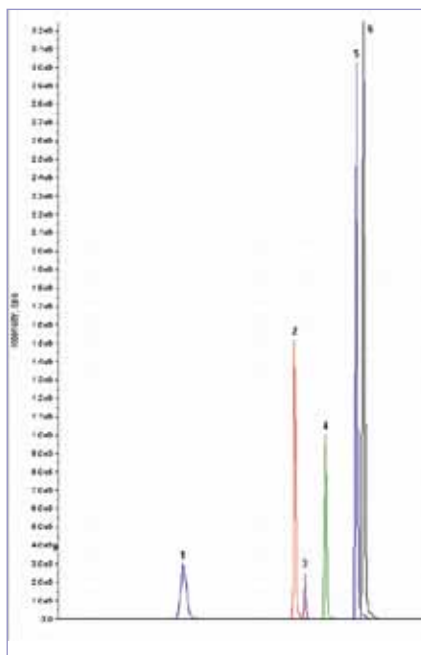


Allergens analysis by mass spectrometry

By Bert Pöpping, Eurofins

One of the most common food allergies in early childhood is caused by milk, with approximately 3 % of the children under the age of two being affected. Clinical manifestations range from disorders in the digestive tract to anaphylaxis. There is no clinical treatment available; patients must strictly avoid the allergens and rely on accurate food labelling, since undeclared or unintentionally added allergens may provide a major health risk.

To be able to provide consumers with safe products, reliable detection methods are essential. Allergen analysis is routinely carried out with antibody-based methods (ELISA) and to a lesser extent by PCR. These have the advantage of being comparatively quick and easy to handle, however in the case of ELISA, cross reactions can occur with other food proteins in some matrices, and only one allergen per ELISA can be tested. On the other hand PCR is not quantitative nor does it allow sensitive detection of allergen-derived DNA of egg and milk. Therefore alternative methods, which



are capable of detecting the allergen unambiguously and offer multi-allergen screening possibilities, would be an important addition to existing methods. Here, mass spectrometry (MS) might be the method of choice to complement ELISA and PCR. This method directly detects protein fragments (peptides) of target allergens and allows for multiple detection of these targets, e.g. nuts + sesame or milk + egg + soya + nuts + sesame.

Eurofins has initiated an internally funded research project focussing on the development of a MS method. This work has successfully progressed and **Eurofins can now offer milk allergen analysis by MS and will soon have the capability of detecting more protein-based allergens like nuts, sesame, egg by MS.** The laboratory is also investigating optimisation possibilities and multi-screening approaches.

Contact : bertpopping@eurofins.com

High quality pesticide residue analysis on fruit and vegetables with very short turn-around times

Results with Dr Specht quality in 8 hours to 48 hours as a routine service

By Matthias Sauer, Eurofins Dr. Specht Express, Germany

Industry has an increasing need for rapid detection and identification of pesticides in fruit and vegetables with strict demands on analytical competence and service reliability. In order to meet these customer requirements, Eurofins Dr. Specht Laboratory has established Eurofins Dr. Specht Express which is an innovative organisation focused on very fast and guaranteed turn-around times (TAT) even for high sample volumes combined with the highest analytical quality.

Eurofins Dr. Specht Express offers reliable turnaround time packages with 8 hour, 24 hour or 48 hour (TAT) using a powerful multi residue method covering more than 500 different pesticides. This service can be complemented with the service packages for the detection of further specific residues frequently requested for fruits and vegetables such as those for ethephone, dithiocarbamate, nitrate or bromide which are also provided in 24 hours.

The short TAT's are achieved by a combination of a unique production planning system, streamlined lab

processes and flexible lab capacities. Additional service components such as customer defined logistics or pre-harvest- and pre-shipment testing are also provided. The analytical methods used by Eurofins Dr. Specht Express are suitable for testing baby food raw materials as well as organic products.

The services offered result in tangible benefits to the customer in that firstly, perishable goods can be transferred quickly to, for instance, retailers or processing companies giving significant economic advantages and higher product safety. Secondly, the production of fast analytical results allows the customer to make rapid management decisions on the assignment of their goods to different sales channels depending on the fulfilment of legal specifications.

The combination of logistics and fast

analysis in combination with sampling services allows the customer to establish a proactive pesticide residue control system in the early stages of their supply chain.

The service is available through the Eurofins network.

Contact: matthiassauer@eurofins.de



3-MCPD- and glycidol fatty acid ester in oils and fats

By Dr. Katrin Hoenicke, Eurofins WEJ Contaminants, Germany

New official methods for the analysis of 3-MCPD esters and glycidol are currently being validated and will be available soon. In December 2007, a German official food control laboratory reported significant amounts of 3-monochloropropane-1, 2-diol (3-MCPD) fatty acid esters in refined edible oils and fats as well as in food containing refined fat.

The method published by the official food control laboratory uses sodium chloride during the sample preparation step. Recently it has been shown that this method is not specific for the analysis of 3-MCPD and its esters. Other substances, such as glycidol, which may also be present in oils and fats, can be converted into 3-MCPD when using sodium chloride. Eurofins WEJ Contaminants has therefore developed a method which replaces sodium chloride

by sodium sulphate. The application of this method leads to different results especially in palm oil.

In order to compare the results from different laboratories, the method used and the target substances have to be clearly defined. The German Institute for Risk Assessment (BfR) has therefore organised a ring trial and provided three different methods for the indirect analysis of 3-MCPD fatty acid esters and the estimation of glycidol. The aim of this study is to obtain a reliable standard method. Eurofins WEJ Contaminants is involved in this study and will offer the method of choice for the analysis of 3-MCPD esters and the estimation of glycidol after completion of the validation study.

Contact: katrinhoenicke@eurofins.de



Sensory evaluation - An important part of the toolbox for food testing

By Steffen Solem, Eurofins Norsk Matanalyse, Norway & Helge Dømmong, Eurofins Wiertz-Eggert-Jörissen, Germany

Sensory characteristics are important to ensure customers are satisfied with the quality of food. Sensory evaluation is an important tool in this respect. When used in combination with instrumental techniques it is also possible to determine the chemical compounds responsible for some of the sensory characteristics.

In sensory evaluation, panels of humans are used as the analytical instrument. The strength of sensory evaluation is the unique ability to detect product characteristics relevant for consumers that otherwise would be difficult or impossible to detect using other analytical methods. However, humans are affected by factors such as expectations, stress, etc. and have subjective opinions. This can influence their sensory perception and hence the evaluation made. The appropriate use of sensory evaluation takes advantages of its strength, minimises its weakness and gives relevant, objective and reliable results.

Sensory evaluation is applicable at all stages of a food product's life cycle. Different types of sensory methods such as expert testing and consumer testing, previously described in July 2008 in Eurofins Food Testing News N° 27, are relevant for different areas of application. Shelf life studies are commonly performed where sensory analysis is used in conjunction with microbiological



analysis to ensure that the "best before" dates are appropriate.

It is also possible to combine sensory evaluations with instrumental analyses such as gas chromatography coupled to mass-selective (GC-MS) or time-of-flight (GC-TOF-MS) detectors. This combination can be used to investigate the compounds responsible for some of the sensory characteristics of the food. For example, it was possible to identify the chemical compounds that were responsible for the formation of off-flavours, like skatole (faecal), and para- and meta-cresol (pigsty) in pepper. Applied to carrots, a combined analysis allowed the identification of the main sensorial items involved in

the general consumer appreciation and to apply a statistical treatment in order to link them with the chemical and olfactory compounds. A segmentation of the market with groups of consumers preferring specific varieties could so be set up.

Eurofins laboratories in several countries, including Germany, Denmark, Norway, Slovakia, Italy and France are competent to carry out sensory evaluation, and can combine this with instrumental analyses. These laboratories offer sensory analysis, consumer testing, proficiency testing schemes, training courses and/or consultancy within the sensory field.

Contacts : sts@matanalyse.no;
helgeduemmong@eurofins.de

in brief

GMO in linseed samples

The EU Rapid Alert System for Food and Feed (RASFF) reported the finding of a genetically modified (GM) linseed in several products in September. The herbicide-tolerant GM-flax CDC Triffid (event FP967) is not approved in Europe thus there is a zero tolerance of any traces in food and feed samples. For detection of this genetically modified linseed, screening methods as well as modified specific methods are available from Eurofins.

Contact: gmoanalytics@eurofins.com

Eurofins' acquisition in the US

In June 2009, Eurofins Scientific US completed the acquisition of Strasburger & Siegel, Inc., a food testing laboratory based in Hanover, Maryland. The acquisition strengthens Eurofins' growing presence in the U.S., especially in the poultry, seafood, juice, spice and cocoa testing markets as well as providing a base of operations in the Eastern US region.

Established in 1926, Eurofins Strasburger & Siegel is one of the oldest laboratories in the US dedicated to the analysis of food products. Today, it provides the highest quality analytical testing and consulting services in the primary areas of analytical chemistry, microbiology as well as analysis for filth and extraneous matter. The laboratory maintains this ability to provide a quality service and results through participation in multiple check sample programs and laboratory certification programs, as well as regular and rigorous internal validation of laboratory work.

Contact : carlosnavarro@eurofins.com

Eurofins builds new microbiology laboratory in Brazil

In August 2009, Eurofins opened a new modern microbiology laboratory in Brazil (Indaiatuba near Sao Paulo). EUROFINS DO BRASIL ANÁLISES DE ALIMENTOS LTDA now performs the necessary tests to determine microbiological parameters on food samples in accordance with the ISO 17025 quality standards.

The laboratory has the capability to analyse all food-related pathogenic microorganisms as well as hygiene parameters to a high quality due to the utilisation of the EURACHEM guidelines. The laboratory can react very fast to requests for testing and cope with high sample volumes. It uses official methods in accordance with international standards such as ISO and the official Brazilian Reference Methods from the Ministry of Agriculture (MAPA).

Contacts : edisonfraia@eurofins.com.br; helganeumannhensel@eurofins.de

Eurofins at BioFach 2010 in Nuremberg, Germany

Eurofins will again be present at BioFach 2010, the World Organic Trade Fair, with its own exhibition stand. A number of talks will be given on the subject of security in the organic food products industry as part of Eurofins Organic Food Safety Seminar 2010. Experts from our global network of laboratories and "Competence Centres" for food analyses will provide an update on issues of current interest in the organic food products industry.

The official seminar programme will be published on www.eurofins.de. All talks

will be given in English.

BioFach is being held in Nuremberg from 17th to 20th February 2010. We sincerely look forward to welcoming you at our seminar and at our exhibition stand. Please feel free to make an appointment with us in advance.

For further information please contact : service@eurofins.de

Eurofins 18th International Seminar: Food Safety Solutions

The Eurofins International Seminar to be held in Paris, France on 21st & 22nd April 2010 will be spotlighting "Food Safety Solutions". The move away from its traditional focus on biotech developments has been made with a view to opening up the seminar to a wider audience, and to address consumer health and safety issues.

At a time of global economic downturn, there is need for tougher vigilance on food safety. The danger of product adulteration is always at its greatest when financial pressures lead to cost cutting and food companies seek cheaper supplies. This is illustrated by the recent example of the addition of melamine to milk powder to boost its apparent quality.

To deal with these concerns, the application of appropriate testing regimes is undeniably the best way to prevent food safety problems. The Seminar will address some hot topics with speakers from enforcement bodies, the food industry and academia to provide an update on matters of current concern in the food safety arena.

Further details are available from : <http://eis.eurofins.com>

Eurofins China

Peter Leedham / peterleedham@eurofins.cn

Eurofins Denmark

Svend Aage Linde / sal@eurofins.dk

Eurofins France

François Vigneau / francoisvigneau@eurofins.com

Eurofins Germany

Maïke Langmaak / service@eurofins.de

Eurofins Italy

Valeria Merlo / valeriamerlo@eurofins.com

Eurofins Japan

Masahiro Mukai / masahiromukai@eurofins.com

Eurofins Netherlands

Linda Tilman / l.tilman@eurofins.nl

Eurofins Norway

Inger Johanne Bakke / inb@matanalyse.no

Eurofins Sweden

Stig-Olof Lundin / stig-oloflundin@eurofins.se

Eurofins Switzerland

Klaus Fuchs / klausfuchs@eurofins.com

Eurofins UK

Graham Evans / info@eurofins.co.uk

Eurofins USA

Lars Reimann / larsreimann@eurofinsus.com

Others countries

info@eurofins.com

Newsletter editorial team:

F. Heupel, S. Noster-Vallée, L. Kandalafi, B. McLean, M. Langmaak, A. Aden, L. Reimann, S. Jensen, S. van Tellingen, M. Martin.

Design : Romain Soussan

© Published by Eurofins Scientific.

All rights reserved. The greatest care has been taken to ensure accuracy but the publishers cannot accept any legal responsibility or liability for errors or omissions that may be made.

For further information & contacts in other countries please refer to our website www.eurofins.com.