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Food Testing News

N° 25 • November 2007

European Union regulates plasticisers in food

By Andreas Grabitz, Eurofins I WEJ, Germany

The estrogenic activity of certain plasticisers, so called phthalates, has been well known for several years. Nevertheless, these substances are still used in many articles in normal daily use due to their beneficial properties and low cost. For the first time, the European Union has recently released limits for phthalate components in food packaging and toys.

Caps for glasses used as food packaging do contain high percentages of plasticisers to guarantee the necessary integrity of the seals during long-term storage. Only for the last few years have these also been used in the European Union in food contact applications.

Under the terms of Directive 2007/19/EC, caps for glasses will now be regarded as equivalent to plastics from a legal point of view. Therefore they will have to fulfil the overall migration limit of 60 mg/kg food. Specific migration limits for the most commonly used phthalates are additionally fixed with the implication that only very small amounts of phthalates may migrate from the packaging into food.

For a range of plasticisers of significantly lower toxicity, the European Union has accepted much higher migration limits in accordance with Regulation EC (No) 372/2007 for an interim period until 30 June 2008. For substances with lower toxicity such as ESBO, ATBC and 7 others the limit has now been raised to 300 mg/kg.

Specific migration limits according to Directive 2007/19/EC

Diethylhexylphthalate (DEHP):	*1.5 mg/kg*
Butylbenzylphthalate (BBP):	*30 mg/kg*
Dibutylphthalate (DBP):	*0.3 mg/kg*
Diisononylphthalate (DINP) / Diisodecylphthalate (DIDP):	*9 mg/kg in sum*

The new statutory requirements, particularly for ESBO and ATBC, achieve a significant improvement for both producers and consumers. Several controls by the authorities do still indicate some results which exceed even the new legal limits. Nevertheless, the European Food Safety Authority (EFSA) has stated that occasional results exceeding the acceptable daily intake are unlikely to pose a risk to human health.

In contrast with this, a very low limit has for the first time been applied to phthalate plasticisers which have proved to be toxic to reproductive processes and human livers. Compliance with the limits will only be ensured by a complete ban of these substances from any food contact material.

Eurofins offers analyses for phthalates, ESBO and ATBC in caps for glasses, packages and plastics by GC/MS. It has been found that the concentrations of diethylhexylphthalate (DEHP) in more than 30% of food samples analysed in Eurofins laboratories still significantly exceed the legal limit. It is reasonable to assume that contamination during production and cross-contamination within the production facility are the main reasons for these findings.

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Brominated POPs need regular monitoring

By Rainer Grümping, Eurofins I GfA, Germany

Due to the high toxic potential of individual brominated POPs (persistant organic pollutants) the monitoring of these chemicals should be part of modern food and feed safety programmes.

Brominated flame retardants (BFRs) are chemicals commonly used to reduce the risk of fire in a great variety of items of domestic and industrial equipment such as electrical and electronic appliances, insulation boards, mattresses and upholstery foam. There are many BFRs used worldwide; the main commercially used ones are listed in the table below. Because of their production processes, use and disposal, BFRs are widespread in the aqueous and terrestrial environment throughout the world.

Polybrominated dibenzodioxins (PBDDs) and dibenzofurans (PBDFs) are superfluous by-products in chemical processes, and are also formed by ignition of BFRs in plastics and other appliances. For example, in many ash-laden run-off samples collected near Ground Zero soon after the September 11, 2001 attack on the World Trade Center and subsequent fire, exceptionally high levels of PBDEs as well as PBDFs were detected. Total Diet Studies indicate that high concentrations of brominated POPs can be found in various fishery products, but other foodstuffs of animal origin (e.g. dairy products, meat) can also be contaminated. The levels of PBDEs in human tissues have increased almost hundredfold in the last three decades. Since all these brominated organic pollutants are lipophilic, persistent and bioaccumulative, concerns regarding the toxicity of brominated POPs are increasing. The worldwide PBB production has already been phased out during the last century. The use of certain PBDE formulations (Penta- and Octa-BDE) has been banned in the EC with adoption of the Hazardous Substances Directive and PBDEs are now classified as priority substances according to the EC water framework guideline 200/60/EC.

The continued use of Deca-BDE products is a subject of ongoing debate. In experimental animal models, exposure to PBDD/Fs is reported to result in many of the adverse effects typical of the well-known chlorinated dioxins. Thus, the establishment of individual Toxic Equivalent Factors (TEFs) for brominated dioxins is highly recommended by the WHO.

Eurofins has considerable experience in the determination of the above contaminants in food and feeding stuffs, as well as in environmental samples and industrial products. The laboratory's well-established analytical methods are accredited in accordance with DIN EN ISO 17025:2005. On behalf of several European authorities, Eurofins has participated in the official monitoring of BFRs in fish products, milk and other fatty foodstuffs. Eurofins also provides similar services to customers in the animal feed industry in support of their quality control programmes addressing ingredients such as fish meal and other fish products. Monitoring of brominated POPs should be in the focus of responsible authorities as well as of up-to-date quality management in industrial sectors which process fatty food or feed of animal origin (e.g. aquaculture, meat, dairy and baby food industry).

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Brominated POPs	Analytical methods
PBDEs – Polybrominated Diphenyl Ethers	GC/MS
HBCD - Hexabromocyclododecane	GC/MS and LC/MS
TBBP-A – Tetrabromobisphenol A	GC/MS and LC/MS
PBBs – Polybrominated Biphenyls	GCMS
PBDD/Fs – Polybrominated Dioxins and Furans	HRGC/HRMS

Detection of extraneous materials in foodstuffs: the Filth Test

By Paola Foresta, Eurofins Chemical Control, Italy

Raw materials and finished products are exposed for extended periods to the risk of various types of contamination. The Filth Test is an analysis which is aimed at detecting the presence of solid particles, especially those of biological origin, which result from preservation, shipment or handling of either foodstuffs or the raw ingredients used in preparation.

The matrices most commonly examined by Filth Test analysis are: flours, baked products, cocoa and chocolate, ground coffee, herbs and spices, dairy products, rice and extruded rice products, alimentary pastes, jam, snack foods, sugars, cereals, starch, tomato products and mushrooms. The most significant impurities that can be found in foodstuffs are materials of animal origin (eggs, larvae, nymphs or adult insects and their fragments, rodent hairs and their fragments, mites, birds' feathers), glass or metal fragments, textile fibres, etc., which may even be of microscopic dimension.

The total amount of solid impurities can increase at various stages of production and a producer is often quite unaware of the actual level of solid impurities present in the foodstuffs produced in his plant. The impurities found generally are a good reflection of the quality of the ingredients which have been used: how hygienically they have been cultivated and stored, the care taken on the manufacturing and packaging processes, during the distribution chain or at the final point of sale.

During the Filth Test impurities are isolated from food and measured in accordance with various methods, the most common being AOAC methods used by the FDA. Sampling is an important issue for Filth Test analysis since infestation is normally non-homogeneously distributed in foodstuffs and so a statistically representative sampling technique is highly recommended in order to maximise the probability that the collected sample contains the same proportion of defects as the entire batch. Some recommendations for sampling are reported in FDA/CFSAN Technical Bulletin Number 5: Macroanalytical Procedures Manual.

Eurofins | Chemical Control is able to perform the Filth test analysis mainly using AOAC Methods and with all the necessary equipment including compound and stereoscopic microscopes, with a camera facility for image analysis. In this way it is possible to photograph the extraneous materials and even perform size measurements.

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Detecting GMO contamination in vegetables

By Andreas Pardigol, Eurofins Scientific Analytics, France

New genetically modified vegetable varieties appear in the fields and on the markets. New analyses now need to be developed for their identification.

Apart from crops most frequently used in genetically modified varieties, such as canola, corn, soya, and recently rice, a broad range of GM plant species is subject to approval and authorisation processes in many countries. Some of these species are already authorised for different purposes in different parts of the world. Transgenic crops include species such as sugar beet, papaya, chicory, melon, squash, cotton, sunflower, lentil, tomato, alfalfa, potato, and wheat.

Eurofins has recently launched a detection and identification assay for GM alfalfa. It now introduces a novel test portfolio for the detection of transgenic sequences in GM vegetables and crops. For each plant species, a test package has been defined in order to screen for target sequences present in GM vegetables and crops, in accordance with sequence information from publicly available databases*.

These new analytical packages offer:

a) a basic screening including of 1 to 3 target sequences for testing of absence or presence of the transgene in the sample;
b) an extended screening for confirmation of initially positive test results. In many cases, the extended screening makes it possible to deduce, by exclusion, which transgenic crop may be present in the sample. This allows the decision as to whether further analysis should be directed to one single or a few transgenic crops;
c) a set of event-specific tests for unambiguous identification of the GMO, such as H7-1 sugar beet, or amylopectin potato event EH92-527-1.

For many species (tomato, squash, sugar beet, melon, cotton, etc.), a quantification of the respective targets is possible, allowing the estimation of the degree of contamination.

*) *For a list of crops and vegetables for which the test has been validated please contact us. For further information on GM vegetables also see http://www.transgen.de/datenbank/pflanzen/ (in German).*

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in brief

Dioxin and PCP in guar gum

Recently, the European Union issued an alert on high levels of dioxins (PCDD/F) and pentachlorophenol (PCP) in guar gum from India. The dioxin pattern confirms that the presence of dioxins is related to the presence of PCP.

Regulation (EC) No. 396/2005 does not establish a maximum residue limit for PCP. However it is foreseen in a draft Commission Regulation that for pentachlorophenol the default limit of 0.01 mg/kg would apply for all foods. No maximum level has been established for dioxins in guar gum. For milk products (containing more than 1 % fat) the maximum limit is 3 pg WHO-PCDD/F-TEQ /g fat. Following the requirement that contaminant levels should be kept as low as is reasonably achievable, the European Commission set an action level of 0.75 pg WHO-PCDD/F-TEQ /g product for guar gum.

Eurofins offers a highly sensitive test for detection of dioxins and PCP both in guar gum and in food to which guar gum has been added.

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Detection of proteins and other by-products of ruminant origin

Concern for BSE (Bovine Spongiform Encephalopathy) has led to restrictions or outright prohibition of the use of proteins and other by-products of ruminant origin in feed for ruminants.

To address the quality and the safety of feed and feed ingredients throughout an integrated international feed supply chain, a strategic alliance has been formed between Veterinary Laboratories Agency (UK) and Eurofins GeneScan. These industry leaders have joined forces to provide a unified basis for testing feed products.

Under the terms of this alliance, Eurofins GeneScan has been granted an exclusive license for North and South America to offer testing services based on test methods developed by VLA.

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Analycen part of Eurofins Group

Eurofins has finalised the acquisition of Lantmännen Analycen AB, a laboratory group with main activities in Sweden, Denmark, Norway, Finland, and Poland. Analycen offers a broad portfolio of laboratory tests for food, feed, agricultural media, the environment and pharmaceutical products. The group has a unique position as service provider for the food and farming industry and has more than 400 employees on staff.

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Market leader in Scandinavia

Eurofins has established the No 1 position in Denmark, Norway, and Sweden in the food and feed testing market. Through organic growth and a number of acquisitions – Steins in Denmark, Labnett and Norsk Matanalyse in Norway and lately Analycen - Eurofins now has more than 1100 employees and more than 25 laboratories in Scandinavia.

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Belnovamann (Slovakia, Czech Republic, South Poland) has joined the Eurofins Group

In October 2007 Eurofins took an important step in developing its presence in the Central and Eastern Europe region (CEE) by acquiring the majority in the Belnovamann group.

With 150 employees, the company operates four laboratories located in Slovakia and the Czech Republic and six further offices throughout the region.

Belnovamann offers services for the food industry, main retailers, and the pharmaceutical as well as the environmental industry. With its logistic network, Eurofins is able to offer a full service for the collection of samples throughout the Czech Republic, Slovakia and South Poland. Over the years, Belnovamann has built up a solid reputation for high quality services for international clients.

Belnovamann is accredited in accordance with ISO 17025 for food, feedstuffs, environmental samples (water, soil, air and wastes), fuels, lubricants and cosmetics and also holds GLP and GMP certificates for the pharmaceutical industry. Through its accreditation in accordance with the Russian standard (GOST), Belnovamann can support customers who export food products to the Russian market.

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