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JRC method to detect chocolate fraud becomes an international standard

EU countries are the biggest consumers of chocolate confectioneries in the world. A method developed by the European Commission's Joint Research Centre (JRC) to measure vegetable fats in milk chocolate has become the first such method to be adopted as an international standard by the International Organisation for Standardisation (ISO). It has been developed to enable the enforcement of the so-called *Chocolate Directive*, which stipulates that European chocolate must not contain more than 5% vegetable fats, other than cocoa butter.

Eighteen EU countries were among the world's top 26 chocolate confectioneries consumers in 2007, ranking from 11.85 kg eaten per capita in Ireland, to 4.5 kg in France and 1.04 kg in Poland. The EU 27 consumed in total 2.5 million tons of chocolate products that year, which account for around half of the global consumption world-wide¹.

"The adoption of the JRC's testing method at international level confirms the EU's leading role in the worldwide fight against food fraud", said Krzysztof Maruszewski, Director of the JRC's Institute for Reference Materials and Measurements (IRMM).

Protecting consumers' right to know

The *Chocolate Directive* (Directive 2000/36/EC) allows the addition of up to 5% of vegetable fats other than cocoa butter in chocolate products. When these fats are added to chocolate, European legislation requires that consumers be informed by appropriate labelling of the product. The threshold of 5% is also an essential requirement for these products to move freely within the internal market.

Prior to the development of the JRC method, no validated methodology existed in this field. It was therefore not straightforward to check whether manufacturers were correctly reporting the amount of vegetable fats other than cocoa butter in milk chocolate, as their chemical composition and physical properties resemble those of cocoa butter very closely, thus making them extremely difficult to quantify or even detect. This left the door open for disputes and uncertainty as to whether or not milk chocolate products fulfilled legal requirements.

Scientists at the JRC have been working on the problem since the entry into force of the *Chocolate Directive* in 2003, in close contact with the European Commission's Directorate-General for Agriculture and Rural Development.

¹ Data from CAOBISCO, the Association of chocolate, biscuit and confectionery industries of the European Union 2007 Consumption ranking:

http://www.caobisco.com/doc_uploads/Charts/ranking_of_consumption_chocolate_confectionery_2007.pdf
Consumption trends: http://www.caobisco.com/doc_uploads/Charts/consumption_trend_2007_2.pdf

As a result, reliable analytical methods were successfully developed to detect and quantify so-called cocoa-butter equivalents (CBEs) in milk chocolate.

International recognition of EU standard methods for chocolate

The JRC submitted its milk chocolate testing methods to the International Organization for Standardization (ISO) – the world's largest developer and publisher of international standards - in 2007. After a 2-year independent peer review process, the method has been adopted by ISO as standard ISO 11053:2009.

Two other JRC methods to determine foreign fats in dark chocolate were previously adopted as international standards in 2007. This new method for milk chocolate took longer to develop because of the increased complexity of the measurement, as the milk fats in milk chocolate interfere with vegetable fats.

The international adoption of the JRC method for determining CBEs in milk chocolate marks the satisfactory completion of the JRC's work on foreign fats in chocolate.

Toolboxes available from JRC-IRMM for cocoa butter and CBEs calculation

To help analytical chemists implement the testing methods for chocolate products correctly, JRC-IRMM has also developed a set of so-called toolboxes, which can be freely downloaded from the JRC-IRMM website. The toolbox comprises the method descriptions, electronic evaluation sheets, and links to the appropriate cocoa butter reference materials which can be ordered via JRC-IRMM's online catalogue.

Links

JRC IRMM: <http://irmm.jrc.ec.europa.eu>

Toolboxes for cocoa butter calculation:

http://irmm.jrc.ec.europa.eu/html/activities/cocoa_butter_calculation_toolbox/

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About JRC-IRMM

The Joint Research Centre (JRC) is a Directorate-General of the European Commission providing independent scientific and technical support to European policy-making. Its Institute for Reference Materials and Measurements (IRMM) promotes a common and reliable European measurement system in support of EU policies. The prime objective of the JRC-IRMM is to build confidence in the comparability of measurements by the production and dissemination of internationally accepted quality assurance tools, including reference materials, validated methods, reference measurements, inter-laboratory comparisons and training.