

zött alapanyaglistájáról választhatják a cukrászok, a győztes tortát pedig a Wessling Hungary Kft., független élelmiszervizsgáló laboratórium vizsgálja.

A laboratóriumba érkező tortát nem dédelgetik: ledarálják, összekeverik, és homogén laboratóriumi mintaegyedet képeznek belőle! A minta előkészítésén ugyanis nagyon sok múlik, ettől döntő mértékben függ, hogy a kapott analitika megbízható eredményt szolgáltat-e később. A tortaszeletből kapott homogén mintából történnek ugyanis a klasszikus és műszeres analitikai mérések.

Az **élelmi rosttartalmat** az emberi emésztést utánzó enzimekkel határozzák meg és állandó főmérsékleten egy vízfürdőn enzimekkel megemésztik. A tortát kemencébe rakják, és teljesen elégetik, így kapják meg a szervesetlen anyagok mennyiségét. És ez még nem minden: kénsavban is felforraltják, és az így a katalizátor jelenlétében több mint 400 C-on (!) elroncsolt maradékot átdestillálva mérik meg a fehérjetartalmat. Homokkal összekeverve, termosztátba helyezve a szárazanyag- és a víztartalmat ellenőrzik, sósavval roncsolva és szerves oldószerral kioldva pedig a zsírtartalmat mérik meg.

Ezek után már csak „hab a tortán” az induktív csatolású plazma optikai emissziós spektrométerrel (röviden, csak ICP-OES) zajló mérés, amely több ezer Celsius fokon zajlik (a nátrium- és a sótartalmát ellenőrzik így), vagy a folyadékromatográffal történő vizsgálat, amelynek során a különböző cukrok és koralkoholok mennyiségét mérik meg a szakértők.

Az elmúlt évek versenyei és vizsgálatai bizonyították, hogy fehér liszt, hozzáadott cukor, mesterséges adalékanyag és tartósítószer nélkül is lehet mennyei süteményeket készíteni. **Nincs ez másképp a Szentivánéji Álomnál sem: a meggyes, almás, fahéjas, tortakülönlegesség mindenben megfelelt az elvárásoknak. Egy szelet szénhidrátartalma: 13,3 g, energiaértéke: 252,5 kcal.**

Az Egy Csepp Figyelem Alapítvány által szervezett verseny győztes tortáját minden évben július végén, augusztus elején ismerheti meg a nagyközönség, és az augusztus 20-i ünnepségeken kóstolhatja meg először a finomságot, a Magyar Ízek Utcájában. Ezt követően pedig az ország számos cukrászdája árúítja majd.

Forrás: Laboratorium.hu

Chlorate and perchlorate: stricter regulations

Preparations containing chlorates (ClO_3^- ions) are widely used total (non-selective) herbicides, which were already banned in the European Union in 2011, but still much of them remain in the environment and, in addition, chlorates may form during the chlorination of waters as well, so despite the ban on the use of pesticides, the supply of chlorate residues is, so to speak, continuous.

Since chlorate residues in foods are often detected by laboratories in amounts exceeding the permissible limit values, the regulation containing the permissible chlorate residue values in foods was amended by the European Commission, effective from July 1, 2020. From the entry into force of the regulation, regular monitoring of foodstuffs, including drinking water, has been even more important than before.

According to food safety and environmental toxicology data, chlorate residues herbicides have a detrimental effect on warm-blooded organisms, including humans. Among the general properties of chlorates, the best known are their damaging of the hemoglobin in the blood (methemoglobinemia) and the causing of various kidney problems.

Based on the decision of the experts of the European Commission, the total herbicide commonly used in agriculture, chlorate was withdrawn from the market in 2011.

In addition to chlorate ions, perchlorate ions, appearing in the environment primarily as impurities of geochemical origin or from industrial activity, also have a similar effect, said Dr. Tamás János Szigeti, editor-in-chief of the Journal of Food Investigation and director of business development of the independent laboratory WESSLING Hungary Kft. to Laboratorium.hu.

Perchlorates (ClO_4^- ions) may also form during the decomposition of hypochlorite products used for general disinfection (mainly in connection with the chlorination of waters), but perchlorates can also form naturally in certain rocks by geochemical means. Permissible (still tolerable) limits for perchlorates in foods are contained in Commission Regulation (EU) 2020/685. Depending on the type of food, permissible limit values range from 0.01 to 0.75 mg/kg. Among other things, perchlorates inhibit the dietary intake of iodine in warm-blooded organisms, including humans, and so may interfere with the functioning of the thyroid.

The cheapest and most effective method for the disinfection of various water systems and easily infected surfaces due to the coronavirus pandemic is usually the use of a chlorine-containing disinfectant such as sodium hypochlorite (Hypo) or, in the case of aqueous systems, chlorine dioxide. It should be emphasized here that in the practice of water utilities it is essential to disinfect the piping system and the drinking water itself, therefore, water utility operators cannot be blamed for the occasional presence of detectable amounts of chlorate ions in the drinking water. Consequently, it is necessary to monitor (continuously) the amount of chlorate generated by the disinfection technology.

This is the reason why Commission Regulation (EU) 2020/749, amending the tolerable chlorate residue values given in Annex 3 to Regulation (EC) No 396/2005, entered into force in the EU from July 1, 2020.

Therefore, the monitoring of drinking water has become especially important in the various plants and facilities. As chlorate and perchlorate ions can also contaminate agricultural areas through water, in addition to drinking water, the monitoring of foodstuffs according to the limit values laid down in the above regulation is also advisable.

Unfortunately, the general tolerable residue level of 10 µg/kg (0.01 mg/kg) for chlorates in foodstuffs is often exceeded due to the amount of chlorate present in the environment. For this reason, the presence of chlorate ions on food, including drinking water, should be monitored continuously.

The Food Safety Business Unit of WESSLING Hungary Kft. continuously monitors the changes in EU food safety regulations. Therefore, a validated and accredited method package was adopted and developed for the determination of chlorate and perchlorate ions in foodstuffs and waters.

With these analyses, producers and distributors, as well as plant and water utility managers can ascertain the good quality of the products manufactured or the drinking water supplied by them with a high certainty.

Although the structures of these two inorganic anions are quite similar (perchlorates contain one more oxygen atom than chlorates), their chemical analytical determination requires considerably different methods and techniques: while chlorate ions in water samples can be determined by relatively simple ion exchange liquid chromatography methods, the analysis of perchlorates at the residue levels prescribed by the European Union requires liquid chromatographic

separation and mass selective detection (LC/MS/MS). The determination of chlorate ions in foodstuffs is also performed by a self-developed LC/MS/MS technique.

Source: Laboratorium.hu

What contaminants are expected to be present in corn? Why is it necessary to analyze them?

Due to the dry summer, corn harvest began already in August. Experts of the WESSLING Knowledge Center, one of Hungary's largest laboratories, also involved in pesticide analysis, will answer the question of why the testing of corn for pesticides and mycotoxins is important.

The spread and cultivation in monoculture of maize has had a beneficial effect on the spread and growth of several pathogens, such as fusariums, different types of blight and aphids. It is therefore advisable to take into account the nutrient requirements of the plant during maize production and to ensure its replenishment. For example, the fertilizer applied to the soil reduces the damaging activity of the pests found in the soil.

For this purpose, soil disinfectants such as phorate, carbofuran, carbosulfan or bendiocarb can be used successfully. Germ-infectious pathogens can be controlled with preparations containing captan, benomyl, TMTD and carboxin, among others, but where the seeds sown can be eaten by pheasants or crows, repelling preparations (ziram, Daphne oil) are recommended.

Warm, dry weather and unfavorable storage conditions promote the infection of maize and wheat by microscopic fungi. The most significant toxins produced by the fungi are aflatoxins produced by *Aspergillus* fungi (mainly as a result of climate change), and the mycotoxins produced by fusarium-type fungi (deoxynivalenol, fumonisins, zearalenone, T2 and HT2 toxin). Until the end of the 20th century, aflatoxins were mainly formed in fungal-infected grains in Mediterranean countries, today, however, they are considered a source of danger by agricultural experts in Central Europe and Hungary as well.

Mycotoxins can occur in both natural and artificial environments. In the course of their life activities, they produce metabolic compounds, some of which may even be useful (e.g., certain antibiotics), but others have particularly harmful effects on humans and animals: there are compounds that damage the kidneys and liver,

some are carcinogenic or endocrine disruptors, others are neurotoxins, said the staff of the Food Testing Laboratory of the WESSLING Knowledge Center, also at the forefront of mycotoxin analysis, emphasizing that mycotoxins are formed not only during the production period but also, under inadequate conditions, during transport and storage. Therefore, at WESSLING Hungary Kft., a multitoxin analytical method was developed, with the help of which the amount of the most important mycotoxins from a food safety point of view can be determined in a single step.

The essence of the separation method used is that compounds of interest are extracted by the experts from the homogenized sample, the extract is purified, and the mycotoxins in the extract are separated by liquid and/or gas chromatography, they are identified and their quantities are determined.

Toxic metals entering foodstuffs from the soil are analyzed by the ICP (Inductively Coupled Plasma Emission Spectrometry with optical or mass selective detection) technique; the varietal identity of the seeds is determined by molecular biological methods or mass spectrometry, their genetic purity (the fact of being GMO-free) is also determined by a molecular biological method (RT-PCR, Real-time polymerase chain reaction).

Without the application of chemical plant protection, pests and molds grow on plants. Fungal infection can trigger mycotoxin production. Although with good agrotechnical practice, the damage caused by pests can be kept at an acceptable level, but it is inevitable that pesticide residues may appear in foodstuffs intended for human consumption, posing a risk to human health. Besides many other molecules, the following types of pesticides are most often detected by the laboratories in maize during the analyses: chlorpyrifos, cypermethrin, deltamethrin, piperonyl-butoxide, azoxystrobin, difenoconazole.

Strict professional and technical requirements must be met in order to reliably detect the residues and contaminants found in foodstuffs. For example, residual values of glyphosate, one of the most widely used total herbicides, are determined using the HPLC-MS/MS (high performance liquid chromatography-mass spectrometry) technique by the staff of WESSLING Hungary Kft.

Source: Store Insider

The sugar-free Cake of Hungary: „Midsummer Night's Dream” in the laboratory

After „Little Chestnut”, „Dotted Annie” and „Apricot Bubble”, this year’s winner, i.e., „Midsummer Night's Dream” also visited the Food Testing Laboratory of WESSLING Hungary Kft. There are real masterpieces, sugar-free (without added sugar) cakes behind the fabled names: the winner of the Sugar-free Cake of Hungary competition, organized by the One Drop of Attention Foundation, was tested.

Especially talented confectioners have been pitting their creativity and expertise against other ones' in the Sugar-free Cake of Hungary competition every year since 2012. Modern and healthy recipes are submitted to the competition organized by the One Drop of Attention Foundation and the Hungarian Confectioner Industry Board.

Each year, the ingredients for the cakes can be chosen by the confectioners from a list of ingredients checked by the Hungarian Dietetic Association, and the winning cake is tested by WESSLING Hungary Kft., an independent food testing laboratory.

The cake delivered to the laboratory is ground, mixed, and a homogeneous laboratory sample is prepared from it. Sample preparation is crucial, since the homogeneity of the laboratory sample to be tested plays a major role in determining whether the results obtained during the analysis will be reliable. Classical and instrumental analytical measurements are carried out on the homogeneous sample obtained from the slice of cake.

Dietary fiber content is determined at a constant temperature in a water bath using enzymes that mimic human digestion. A portion of the cake sample is placed in a muffle furnace and completely incinerated to obtain the amount of inorganic matter. The protein content of the cake is determined by the Kjeldahl method, after distillation as ammonia following digestion with concentrated sulfuric acid at 400 °C. The dry matter content of the winning cake is determined in a drying oven after mixing with laboratory sand, while the fat content is determined by organic solvent extraction following digestion with hydrochloric acid.

The amount of salt (NaCl) in the cake is determined by determining its Na content. To do this, the cake sample is dissolved by acid digestion, and after a few sample preparation steps the optical emission of the sodium content of the sample is analyzed in an ICP-OES (ICP-optical emission spectrometry) instrument at a temperature of several thousand degrees Celsius.

The sugar and sugar alcohol content of the winning confection is determined after separation by high performance liquid chromatography.

The competitions and analyses of the previous years have proven that cakes with excellent organoleptic properties can be made without white flour, added sugar, artificial additives and preservatives. This holds true for the Midsummer Night's Dream as well: the specialty cake with sour cherries, apples and cinnamon met all the requirements. The carbohydrate content of one slice of the cake was 13.3 g, its energy content was 252.5 kcal (approximately 1,055 kJ).

Every year, the winning cake of the competition organized by the One Drop of Attention Foundation is revealed to the general public at the end of July or the beginning of August, and the delicacy can be tasted for the first time at the festivities of August 20 in the Street of Hungarian Flavors. Following this, it will be sold by many confectioneries throughout the country.

Source: *Laboratorium.hu*