Low microplastic concentrations in fish ponds

The environmental prevalence of microplastics and their physiological effects are not yet well known, therefore, attention is drawn by the researchers of the independent laboratory of WESSLING Hungary Kft. and the Institute of Aquaculture and Environmental Safety of Szent István University to the importance of caution and continuous monitoring.

The investigation, unique at the international level, have shown that microplastics can be detected not only in natural waters, but also in fish ponds where freshwater fish farming is conducted. The good news is that, compared to other surface water measurements, the concentrations in fish ponds tend to be low.

Waters, sediments, fish stress and fish processing technologies are analyzed by the independent testing laboratory, the university and other professional partners participating in the project called „Development of a new risk management model system to increase water and food safety in the fish product line", briefly called HappyFish, new, cost-effective methods are developed and limit values that play an important role in serving as the basis for legal regulation are recommended.

The presence of microplastics (particles smaller than 5 mm) in our environment is becoming an increasingly complex challenge for environmental and food safety experts. In the case of seas and oceans, scientists have been warning of the new environmental hazard for years, however, recent laboratory analyses of domestic fish ponds provided satisfactory results.

In one of the most recent research phases of the project, the microplastic contents of samples taken from lakes with circular dykes or valley dams, typical of domestic fish farming, were compared to the results of samples from intensively angled ponds and from natural watercourses and environmental ponds. Samples were taken at the point of introduction of the water supply of the fish ponds, from the effluent and the sediment.

The values measured in the waters were typically in the range of 5 to 20 particles/m^3. These values are less than one half of the amount detected in the Danube in 2018 (50 particles/m^3). In comparison, there is a Chinese lake, three times larger than lake Balaton, in which the number of microplastics particles has been measured to be in the range of 3,000 to 25,000 per cubic meter.

In the case of sediments taken from fish ponds in the vicinity of the exit point of the effluent, the presence of microplastics often could not be detected at all. Where samples taken from the bottom of the lake were positive, only 0.4 to 1.6 particles were present in 1 kg of sediment, which is extremely low compared to international values, since in some places (e.g., in the sediment of the Venetian Lagoon) a hundred or eve a thousand times more particles can be present, according to the researchers who recently published their results in a prestigious international journal.

The types of plastics detected further support previous domestic findings: most common are the materials that are produced and used in the largest quantities, typically as packaging materials, such as polypropylene, polyethylene and polystyrene. The study of fish was not included in the study, because that requires further method developments. Even international scientific publications provide information only about microplastics present in the gastrointestinal tract of fish, however, exploration of the transfer of micro- (or, rather, nano-) sized plastic particles to tissues and their effects is still at an early stage. For this reason, in addition to studying the environmental distribution of microplastics, it is also important to investigate their physiological and ecological risks in as much detail as possible. Based on the results of the HappyFish project, in order to carry out this type of study, intensive ecotoxicological method development has started at the Institute of Aquaculture and Environmental Safety of Szent István University.

In general, with regard to the microplastic analysis of surface waters, it can be said that comparing the results is difficult, because different researchers and working groups use different methods. In order to solve this problem, the Hungarian research team has been performing a significant work in the field of freshwater sampling and sample preparation within the framework of the µMM – Microplastic Sampling Method – project. Their latest results were presented in May in Helsinki at a conference of several thousands of people called the Annual Meeting of the Society of Environmental Toxicology and Chemistry.

The study does not stop here, as elaboration and continuous implementation of complex monitoring programs and further extensive data collection is essential for understanding the environmental effects caused by microplastics. One of the pioneers of this is WESSLING Hungary Kft., and so the 4th International Danube Expedition is joined by the company and the sampling method using pumps developed by it. For the first time this year, the chemical and biological measurements coordinated by the International Commission for

the Protection of the Danube River and realized through the cooperation of the water organizations of member states includes microplastics analysis along the Danube as well. The survey of the river above Budapest and below the capital will also allow the comparison of the sedimentation chamber (ICPDR) and pumped (WESSLING) sampling methods.

The consortium of the project "Development of a new risk management model system to increase water and food safety in the fish product line" consists of the independent testing laboratory of WESSLING Hungary Kft. (head of the consortium), the Institute of Aquaculture and Environmental Safety of the Faculty of Agricultural and Environmental Sciences of Szent István University, its Department of Refrigeration and Livestocks' products Technology of the Faculty of Food Science, The Fishmarket Kft. and SKC Consulting Kft.

The total net grant amount is 1,419,187,223 HUF, of which 1,095,243,937 HUF is non-refundable. The tender of the National Competitiveness and Excellence Program was announced by the National Research, Development and Innovation Office, and the noon-refundable grant is provided by the Hungarian State.

University-laboratory collaboration

State-of-the-art laboratory equipment and methods are available to the engineering students of the University of Debrecen through the new collaboration between the Faculty of Agricultural and Food Sciences and Environmental Management and WESSLING Hungary Kft.

The collaborative work will also extend to microbiological, analytical and genomics research. Scientific results may even be published in the prestigious professional journal of the company, the Journal of Food Investigation in Hungarian and in English.

We provide students with the opportunity to spend a few weeks or even a full semester of laboratory practice with us and even work at WESSLING later. In addition, it is important for us to provide new and innovative responses to current challenges, particularly in the area of food safety. In this cooperation, we plan to rely on the knowledge base of the faculty, emphasized managing director Dr. László Zanathy.

When educating engineers, it is crucial that students develop an engineering approach, for which, in addition to theoretical knowledge, professional practice is essential. We consider it important that our students get to know the various large instruments not only in the laboratories of the university, but also at such well-equipped companies with international reputation, as WESSLING Hungary Kft., emphasized dean Dr. Diána Bánáti at the press event at which the cooperation agreement with the consulting, testing and planning company was signed by the Faculty of Agricultural and Food Sciences and Environmental Management of the University of Debrecen.

More than 1,400 students are enrolled at the Faculty of Agricultural and Food Sciences and Environmental Management of the University of Debrecen, and this year 415 applicants were accepted, an increase of eight percent over the previous year.

It was said at the event that the WESSLING as a family business has been operating in Hungary for 27 years and is primarily engaged in environmental, food safety and drug control testing. Through this cooperation, the Faculty of Agricultural and Food Sciences and Environmental Management is now its new practical training site.

The Cake of Hungary in the Laboratory

The award-winning creation of the Sugar-Free Cake of Hungary competition, held for the eighth time, was once again analyzed in the food testing laboratory of WESSLING Hungary Kft. The analyses confirmed that the cake has excellent organoleptic properties and does not contain added sugar, which means that it may be a good choice for people with diabetes who are looking for something sweet.

This year, the creation of the *A Cappella* confectionery of Szeged, prepared without added sugar, won the Sugar-Free Cake of Hungary competition, organized each year by the *One Drop of Attention Foundation*, together with the Association of Hungarian Confectionery Manufacturers. The victory of the „Little Chestnut" was announced in the Parliament together with the Cake of Hungary and the presentation of the August 20 festivities. The Cake of Hungary is the "Lace of the Blessed Virgin", prepared by the Tóth Confectionery. The general public will first be able to taste the two winning cakes on August 18, 19 and 20 in Budapest, at the Street of Hungarian Flavors.

The Sugar-Free Cake of Hungary competition, held for the eighth time, was open to all confectionery and catering establishments of Hungary. Confectioners could use the ingredients that are

on the list approved by the Hungarian Dietetic Association to make their cakes.

This year's winner is the „Little Chestnut", prepared by László Gyuris, master confectioner of the *A Cappella* Confectionery of Szeged with a golden wreath, and his team. The cake does not contain added sugar or cereal flour. Its taste is based on the chestnut, which is complemented by pleasantly sour blueberries and crunchy hazelnuts. The top of the confectioner's creation is covered with sugar-free milk chocolate, surrounded crown-like by chocolate arches. This gives the cake an elegant look in addition to its harmonious, unique taste. According to the calculations of the Hungarian Dietetic Association, the "Little Chestnut" prepared without added sugar contains only 14.9 g of carbohydrates and 854 kJ energy per slice, so it may be a good choice for people with diabetes, but it is also recommended to anyone who pays attention to reducing the amount of carbohydrates in their diet. Laboratory analysis of the cake was performed by the independent food testing laboratory of WESSLING Hungary Kft.

The objective of the *One Drop of Attention Foundation* with the competition is to draw the attention of confectioners to the growing demand for cakes with no added sugar that can be incorporated into a balanced diet.

Investigation of radio isotopes in water

Substances that emit ionizing radiation can enter the human body from numerous sources, such as foods, including drinking water. That is the reason why the radiochemical testing of waters is subject to strict regulations, however, at a European level, only a few laboratories are able to carry out such tests.

The intensity and type of ionizing radiation a man is subject to during their lifetime does matter, since exposure to higher levels of radiation poses a higher health risk. In addition to radiation from outer space and from soils, internal radiation exposure comes from radioactive isotopes that enter the human body through the food chain or by inhalation.

The internal radiation exposure due to food consumption is only about 2% of the total radiation exposure. Exposure coming from drinking water accounts for only a fraction of this value. Nevertheless, continuous monitoring of ionizing radiation exposure is still important, as there may be waters with higher than average natural radioactivity.

All this was told to Laboratorium.hu by Miklós Süveges, head of Hydrosys Labor Kft., Miklós, a company with more than 30 years of experience, recently acquired by one of the largest independent laboratories in Hungary, WESSLING Hungary Kft. The expert added that the possibility of radioactive isotopes being introduced into drinking water in quantities that could pose a health risk cannot be excluded.

The most recent, 2015 amendment of Government Decree 201/2001. (X. 25.) on the monitoring of radioactivity in drinking water defines the measurement parameters, including the amount if tritium, states the methods that can be used, and declares that starting from 2016, water utility companies should also regularly monitor the radioactivity of the drinking water provided.

The majority of the most common isotopes in water are difficult to measure, and only a few laboratories are able to determine them, said Miklós Süveges, according to whom only a negligible number of artificial isotopes have been detected in Hungarian drinking waters so far besides natural radioisotopes, but their quantity did not pose any health risk.

The equipment of Hydrosys Labor, now part of the Hungarian corporate group of WESSLING, can also be used to measure radon activity, among other things.

One of the most common radioisotopes in natural waters is tritium, which is the isotope of hydrogen with a mass number of three. The other most commonly measured natural radioisotope is radon, which is a product of radioactive decay series.

The activity concentration of tritium in surface and groundwaters is no more than 2 to 3 Bq/l, but in the case of protected water sources it is below the limit value of 0.06 Bq/l.

Radon activity concentration vary within a relatively wide range (0-100 Bq/l), depending on the aquifer supplying the drinking water, the water treatment technology used and the time it took for the water to reach the tap of the consumer. Higher radon content can be measured primarily in mineral water wells that are in contact with rocks containing higher levels of uranium and thorium.

Based on the laboratory measurements, it is reassuring that the radon activity of the tap waters tested so far was typically only a few Bq/l. This means that the drinking water supplied by the domestic water utilities is safe and of high quality from a radiochemical point of view.

Foods on hot summer days

Why do foods spoil faster if they are not stored at the operating temperature of refrigerators, but are exposed to the effects of hot summer weather? How can we determine whether they can still be consumed? How should we store foods in hot weather? Why shouldn't the cooling chain be interrupted? How and what is tested in foods? Answers from the Laboratorium.hu scientific news portal.

The reaction rate of chemical and biological processes is fundamentally influenced by the temperature, and so the decomposition of food ingredients is also temperature-dependent. Microorganism generally proliferate better at higher temperatures. The four most important life parameters are nutrients, water, temperature and pH. Of these, temperature can be regulated during the production, transport and storage of foods by ensuring a cooling chain.

If the value one of the above-mentioned four basic parameters is not optimal, bacterial growth can even be stopped. Changing not only the temperature but also the pH, for example, blocks the growth process, it is sufficient to mention the pickling of vegetables. Likewise, access to nutrients can also be restricted, which happens during freezing.

In one of the latest articles of Laboratorium.hu you can read about pathogenic and spoilage bacteria, as well as the importance of the cooling chain and of laboratory tests.

Further details: Laboratorium.hu

NFCSO news

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More dietary supplements withdrawn from the market

Once again, proceedings were initiated by the experts of the National Food Chain Safety Office (NFCSO) because of dietary supplements containing unauthorized components, active pharmaceutical ingredients. Withdrawal of the products from the market was ordered by the authority regardless of shelf life and batch ID.

At the end of April, five different dietary supplements intended to enhance male potency were sampled by the experts of NFCSO. Analyses revealed that the products contained unauthorized components, active pharmaceutical ingredients (*sildenafil, tadalafil*).

Since the presence of active pharmaceutical ingredients in dietary supplements is not allowed, withdrawal of the products from the market was ordered by the authority, and also the immediate recall of dietary supplements that had already reached customers.

Products that contain *sildenafil and tadalafil* are prescription drugs in Hungary. Using them without medical supervision carries health risks.

Investigation of the distributors concernedit was still ongoing during our deadline. The amount of products seized by the authority and collected by the companies so far exceeds 1,000 and their total value is more than 6 million HUF.

NFCSO has informed distributors that marketing of the following products is prohibited:

Product name	Distributor	Shelf life, batch ID
Horse Power herbal dietary supplement capsules for men	K&K General s.r.o. 21 Imricha, Stúrovo, Slovakia	15.06.2023 LOT#:HOER190152
XXL Powering Emperor dietary supplement capsules for men with plant ingredients	Grow Up (UK) LTD. Merseyside 77-81 Seaview Road, England (Place of origin: China)	22/11/2020 LOT: 181123
69 For Man dietary supplement capsules for men with plant extracts	Metropol Capital LTD. 52. WILLINGSWORTH ROAD, WEDNESBURY, ENGLAND (Place of origin: China)	16.01.2021.
Gin Fizz dietary supplement capsules with plant extracts	Bio Natural Kft., 1034 Budapest, Zápor u. 2/C	23.10.2020
Pertinax 3 in 1 dietary supplement capsules for men	K&K General s.r.o. 21 Imricha, Stúrovo, Slovakia (Place of origin: China)	30.03.2021. Lot #: PEAX180925

If any of these products are found to be on the market, customers are requested to notify NFCSO through its green number (06-80-263-244) or e-mail address (ugyfelszolgalat@nebih.gov.hu) to protect the health of consumers and enable swift action by the authorities.

Two-tier trademark system guaranteeing high quality helps consumers in the future

Public expectation as assessed by a representative survey of NFCSO in 2018 in in line with the government's objective of making it clear to consumers which of the many foods to choose, which ones can they trust. A solution to this could be an officially certified food trademark guaranteeing quality, emphasized Róbert Zsigó, State Secretary for food chain supervision at the introductory press conference of the trademark.

Thanks to the successful work of the national authority, NFCSO, safe food has become a basic requirement, and recently the demand for high quality domestic products has increased. However, in a market overloaded with trademarks, Hungarian consumers need help, therefore, there has been a need to create a food trademark that provides consumers with a credible and genuine guarantee. There is a need for a clear symbol that distinguishes high quality food from other products on the market, said the State Secretary of the Ministry of Agriculture.

At the press conference, Róbert Zsigó presented the High Quality Food (HQF) trademark system, which affects producers, manufacturers, processors, distributors and consumers alike, as the display of the logo ensures high quality. It serves as an incentive for producers and processors to develop, improve and maintain quality, and it is also an effective means of increasing consumer awareness. However, the most important thing is that the trademark helps to inform the public, builds trust, guarantees higher quality and contributes to the betterment of the general food consumption culture.

The Secretary of State of the Ministry of Agriculture said that there would be two tiers of the HQF trademark system. The first is the "Basic level", which can be applied for by any producer who falls under this scope according to the relevant EU regulation and has a FELIR ID. Accordingly, it will be open to agricultural and small producers, small, medium and large enterprises involved in food production and processing, as well as food businesses selling their own branded products.

In the case of the second, so-called „Golden grade", unique labeling of the best products will be based on independent tests on the food safety, quality and popularity of the product. Products available to the public will be compared by the experts during product tests, and the best-performing products will be able to apply for this grade. Manufacturers will be entitled to use the "Golden grade" for three years.

The goal of the Ministry of Agriculture is to enable domestic consumers to buy locally produced foodstuffs with the "Basic" HQF trademark, which guarantees the safety and excellent quality of the given product. The best ones will be able to stand out by bearing the "Golden grade" of the HQF trademark.

Supermint ranking of bitter liqueurs completed

Bitter liqueurs were tested in the Supermint program by the experts of the National Food Chain Safety Office (NFCSO). Alcohol, sugar, copper and methanol contents of 26 products were measured in the authority's laboratory, among other things, but labels were also checked, as well as traceability. From a food safety point of view, all liqueurs complied with the regulations, but proceeding were initiated in the case of 14 products (7 manufacturers) because of labeling deficiencies.

In the latest Supermint product test, 26 bitter liqueurs were tested for safety and quality by the experts of NFCSO. The actual alcohol content, as well as the total sugar, extract, methanol, volatile and copper contents of the products were analyzed in the laboratory of the office. The bitter liqueurs tested were fully compliant with the legal requirements based on their food safety and nutrition characteristics.

In addition to the laboratory measurements, the traceability of the products was also checked by the official inspectors of NFCSO and the product sheets and labels were also scrutinized. As for the latter, minor deficiencies were identified for 14 of the 26 alcoholic beverages. Among other things, it was found to be objectionable by the experts that the discriminatory markings on the products were not substantiated on the product sheets and that the data on the product sheets were inaccurate. The responsible enterprises were ordered by the office to correct the errors, and warnings were issued.

In the obligatory popularity test, products were scored by expert and lay judges using the "blind tasting" method. The overall ranking was based on the evaluation of taste, harmony of taste, smell,

color and external appearance. Of the 26 products, first place was awarded to *Berghofer Bitter Keserű Likőr*, *Bitter Likőr* finished second and *Ferencz Keserű Likőr Extra* came in third.

More information, interesting tidbits and detailed test results are available on the Supermint product test page of NFCSO (szupermenta.hu).

FAO/WHO Codex Committee on Methods of Analysis and Sampling meeting held again in Budapest

The 40th anniversary meeting of the FAO/WHO Codex Committee on Methods of Analysis and Sampling (CCMAS) was held between May 27 and 31 in Budapest. Hungary has been hosting the annual meetings of the panel of experts co-ordinating the laboratory issues of the standard systems of the international organization since 1972, and the chairman is also a Hungarian expert every year.

Once again, prominent roles were played in the organization of the prestigious professional event by the Ministry of Agriculture and the National Food Chain Safety Office (NFCSO). Starting from this year, the chairman of the committee is dr. Attila Nagy, head of the Directorate of the Food Chain Safety Laboratory, while the vice-chairman is Dr. Andrea Zentai of the System Organization and Supervision Directorate.

During the weekend preceding the week-long conference, professional work began within the framework of thematic working groups and bilateral meetings. Preparatory meetings on key issues are also gaining interest from year to year, with delegates from around 50 countries and 15 international organizations in attendance.

Members of the panel were expected to carry out important tasks such as revision of the guideline on measurement uncertainty, development of sampling rules, revision of the current collection of standards for test methods and, subsequently, the creation of a database to be operated by NFCSO. In addition, a review of the current collection of methods in the cereal and dairy industries, as well as in the field of fats and oils was carried out and new measurement methods were introduced at the meeting.

Food safety: Everything is in order in Hungary

In advanced economies, it is a basic expectation of consumers that foodstuffs, in addition to having beneficial enjoyment and nutritional physiology values, should be impeccable also from a food safety point of view. The experiences of EU citizens in this field are summarized by the latest Eurobarometer survey.

A Eurobarometer survey conducted in April 2019, involving nearly 28,000 participants, investigated the consumer perception of food safety in the countries of the European Union.

According to the results, in addition to the place of origin, price and taste, food safety is one of the most important factors that consumers take into consideration when making a purchase. The survey contained a number of questions on the concerns of consumers regarding food safety, related to additives, food hygiene, antibiotic and pesticide residues, food poisoning, environmental contaminants, etc.

According to the results of the survey, Hungarian consumers are most concerned about pesticide residues in foods and additives (such as colorants and preservatives). In Hungary, people focus more on the issue of using genetically modified raw materials in foods than the average European Union citizen.

However, results of the survey show that Hungarian consumers are less concerned about food safety issues than the average EU citizen. This is mainly due to the fact that the food safety situation in Hungary is perceived to be balanced by the population.

This finding is also supported by the results of a research conducted by the National Food Chain Safety Office (NFCSO) in the spring of 2019. They reveal that consumers regard food safety as the most important state-controlled area after health care. At the same time, the majority of Hungarian consumers (58%) perceive this area to be stable, and the vast majority (88%) of those who perceive change have experienced a clear improvement.

A study by the European Food Safety Authority last year showed that Hungarian people has confidence in the work of NFCSO. This figure is also supported by this year's Eurobarometer survey. 72% of Hungarians considers NFCSO to be a credible, reliable source of information, which puts the office at the top of the list of European authorities. NFCSO's own data showed similar results in March 2019: 87.5% of respondents were familiar with the National Food Chain Safety Office, and 74% trusted its work. With these values, among the state institutions examined, NFCSO was the most trusted office among Hungarian citizens.