

Drug residues

Medications are used in large quantities for both human and veterinary purposes. After use, drug residues end up in wastewater. Wastewater is treated by sewage treatment plants. However, these are not fully capable of removing all drug residues from wastewater. The result is that drug residues are found in surface water, groundwater, and now even drinking water. Examples of these substances in the environment include residues of anti-depressants, contraceptives, antibiotics, and painkillers.

Drug residues in the environment

Both human and veterinary drugs enter the environment in various ways, especially during the use phase of the drug. These biologically active substances cause undesirable effects on aquatic and soil organisms. In turn, this has a major impact on soil processes and ecosystems. In recent years, due to an increase in monitoring, an increasing number of drugs have been detected in concentrations ranging from ng/l to µg/l.

However, in the authorization procedures of medicines currently take little or no account of environmental aspects. For both human and veterinary medicines, much remains to be done in terms of research and legislation. Laboratory analyses are an important part of this component and will play an increasingly prominent role in future monitoring programs.

Risks and toxic effects

Drugs are designed to be effective in low concentrations. Most drug residues are not acutely toxic, but can disrupt processes, such as the hormonal balance. A well-known example of this is the feminization of male sex organs in fish and snails. Even more worrisome are the possible long-term effects. For example, bacteria present in water can become resistant through prolonged exposure to a mix of antibiotics, or the possible toxic effects in organisms through a combination of drug residues. For humans, the risks are mostly related to the drinking water. The increasing use of drugs, due to population growth and ageing population, could lead to increasing amounts of drug residues in drinking water, if policies remain unchanged. Little is yet known about the cumulative effects on humans. Drinking water companies, in cooperation with the health care sector and pharmaceutical companies, have agreed to reduce the environmental impact of drug residues.

Legislation

The issue of drug residues in the aquatic environment has the attention of the government. However, standard values are not yet specifically included in international regulations, such as the European Water Framework Directive. National and international monitoring programs have been set up to inventory the presence of drug residues. Currently, the “endocrine disruption” is one of the selection of criteria of the Oslo and Paris (OSPAR) conventions for the list of hazardous substances. This led to a list of potential endocrine disrupting substances.

The policy of the Dutch government focuses on general emission reduction measures of substances that interfere with the preparation of clean drinking water. However, eco-toxicologists recommend that drug residues with the highest environmental risks should be placed on the list of priority substances of the European Water Framework Directive. Because no specific norm values have yet been formulated and these substances have demonstrable effects at low concentrations, the analysis results of drug residues should be reported with the lowest possible detection limit that ‘the current state of the art’ offers. In addition, at the request of STOWA and the Ministry of Infrastructure and Water Management, 19 medicine have been designated by the ILOW as guide substances to monitor the removal efficiency of the WWTPs.

Eurofins' offer

Eurofins is involved in various measurement programs and research projects, and has an analysis package for the most frequently occurring pharmaceuticals in surface water, groundwater, wastewater, and seawater. The 19 previously mentioned guide substances from the ILOW study can be analyzed by Eurofins.

By applying modern analytical techniques, such as liquid chromatography with tandem mass spectrometric detection LC-MS/MS, more than 100 drugs can be determined, most of which have a reporting limit of 0.01 µg/l. Examples of these drugs are common drug residues, such as analgesics, antibiotics, hormones, drugs for epilepsy, X-ray contrast media, and antidepressants.

About Eurofins Environment Testing

Eurofins Environment Testing Netherlands is part of Eurofins Scientific and your partner for environmental testing. Our goal is to help you achieve your objectives. With efficient and qualitative analysis techniques we support your business processes. Our customer service is at your disposal with specialized knowledge and extensive experience. You can make use of our own packaging and logistics service. Our reliable couriers take care of sample transfer on site and transport the samples to the relevant laboratory the same day.

Eurofins Environment Testing Netherlands is committed to protecting the environment. With our products and services, we support the responsible use and minimization of substances harmful to humans and the planet. Examples include hormones, pesticides, dioxins and heavy metals. By reducing the usage of water, raw materials and energy, we contribute to sustainability. Our laboratories have developed special programs to minimize environmental risks, such as a safe use of chemicals and waste disposal.

More information

Samples can be collected at the desired location or at a depot. Eurofins' logistic services can be reached at 0800-0991180 or logistiek@etbnl.eurofins.com.

For additional information regarding analyses, reporting, rates, delivery times, service and more, please contact the designated contact person or the customer service during office hours.