



Occurrence of veterinary pharmaceuticals in the aquatic environment in Flanders

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There is a growing interest in the occurrence of pharmaceuticals in the aquatic environment. Pharmaceuticals are classified as so-called 'emerging pollutants'. 'Emerging pollutants' are not necessarily new chemical compounds. Often these compounds are already present in the environment for a long time. But, their occurrence and especially their impact on the environment has only recently become clear. Consequently, data on their occurrence are rather scarce. In this study, we focus on the occurrence of veterinary pharmaceuticals in surface water in Flanders. We have only considered active substances administered to cattle, pigs and poultry. Based on the literature and information concerning the use in Belgium, a selection of 25 veterinary pharmaceuticals has been made. This selection consists of the most important antibiotics and antiparasitic substances applied in veterinary medicine in Belgium. We develop an analytical methodology based on UPLC-MS/MS for the detection of these veterinary pharmaceuticals in surface water. Therefore, the mass characteristics as well as the optimum LC conditions will be determined. To obtain limits of detection as low as possible, the samples are concentrated prior to analysis using solid phase extraction (SPE). Different SPE cartridges will be tested during the method development. At first, this SPE sample pre-treatment is performed off-line. In a next step, online SPE is optimized for this purpose. The analytical procedure will be subject to an in-house validation study, thereby determining recovery, repeatability (% RSD), limits of detection and limits of quantification. Finally, the developed methodology will be applied for monitoring the occurrence of veterinary pharmaceuticals in surface water and groundwater in Flanders. These water samples will be taken in areas characterized by intensive cattle breeding. Moreover, the samples will be collected during springtime. In this season, farmers apply manure, stored during winter, onto the fields.