

Journal of Applied Life Sciences International

16(4): 1-8, 2018; Article no.JALSI.40427 ISSN: 2394-1103

> Adulteration of Urine Samples, Discovery and Mitigation B. Huppertz1, C. Bartling1 and K. Baum2* Published 2nd April 2018

ABSTRACT

Purpose: In the field of urine drug testing, there are several strategies to manipulate a urine sample to become false negative and a wide variety of instructions and manipulation kits are offered on the internet. Some adulteration techniques for urine seriously disturb immunological drug tests but appear to have little effect on gas chromatography-mass spectrometry (GCMS). The present study aimed to evaluate the influence of different manipulants on drugs recovery using GCMS and the detection probability of drug disturbing substances by special test methods.

Methods: 16 different manipulation agents which are considered as effective were tested for their power when analyzing by GCMS. A sample check, an oxidant test, pH, creatinine-concentration, the Trinder sugar test and the Advia-check were taken as manipulation control tests. The recovery of 23 different drugs was determined, which correspond to the required proof by the German control regulations CTU, in concentrations within the range of the required limits.

Results: The effect of oxidants, such as chromate, hypochlorite, peroxide, nitrite and perchloric acid depends strongly on the pH-value of the sample. In untreated urine, their effect is rather low, only in combination with strongly acidic pH-values these chemicals develop their maximum impact. In addition to the oxidants, the analysis can also be disturbed by strong bases, such as caustic soda, strong acid or detergents (dishwashing liquid). These can be detected quickly by their suppression of the internal standard signals. Further investigation has shown that the effect of the adulterants can be reduced by adding buffer solutions and reducing agents to the sample immediately after urine delivery.

Conclusion: This study shows that there are just a few manipulants showing a significant influence on the GCMS result and they all can be detected by the selected tests on manipulants.