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Alkaloids in feed: the efforts to develop screening tests in confidence

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Alkaloids are small molecular weight secondary metabolites produced by a large variety of organisms such as bacteria, fungi and animals but by far the greatest source is plants. These compounds are a very heterogeneous class of secondary metabolites and many are toxic to other organisms. Alkaloid toxins can very much be described as the 'forgotten toxins' or by some as 'emerging toxins'. The first alkaloid to be isolated was morphine in 1804



from the poppy plant. They were identified more than 40 years ago as a serious problem in relation to animal and human health and for a period substantial research efforts were employed into indenting the source of the toxins, their structures and toxicological properties. Alkaloids were found in food of plant origin e.g. cereals, herbs, animal origin e.g. honey, eggs, milk and in animal feed. However for reasons difficult to explain these highly toxic substances seemed to become less important and less researched. In more recent times the activity in relation to alkaloids has markedly increased and is again being taken as a serious threat to the integrity of the animal and human food supply chain. An example of this is the efforts of the European Food Safety Authority (EFSA) which is currently reviewing plant alkaloids as emerging toxins.

The European FP7 project CONffIDENCE is dedicated to the development of inexpensive detection methods for contaminants in food and feed. Among other topics attention is given to methods for the determination of various types of alkaloids as well as alkaloid-containing sclerotia, which may contaminate cereal grains. Methods to detect alkaloid are based on gas chromatography (GC) or liquid chromatography with mass spectrometry (LC/MS) which offer multi-screening possibilities. However, these techniques are lab-based, often laborious and expensive. In CONffIDENCE substantial efforts to produce rapid, antibody based techniques such as lateral flow and multiplex ELISA have been undertaken for the past 4 years. The presentation will outline the success of this Work Package and describe the techniques that have been developed to rapidly detect a braod range of alkaloids in feeds and food.

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