



Tylosin metabolites as markers for the detection of tylosin treatment

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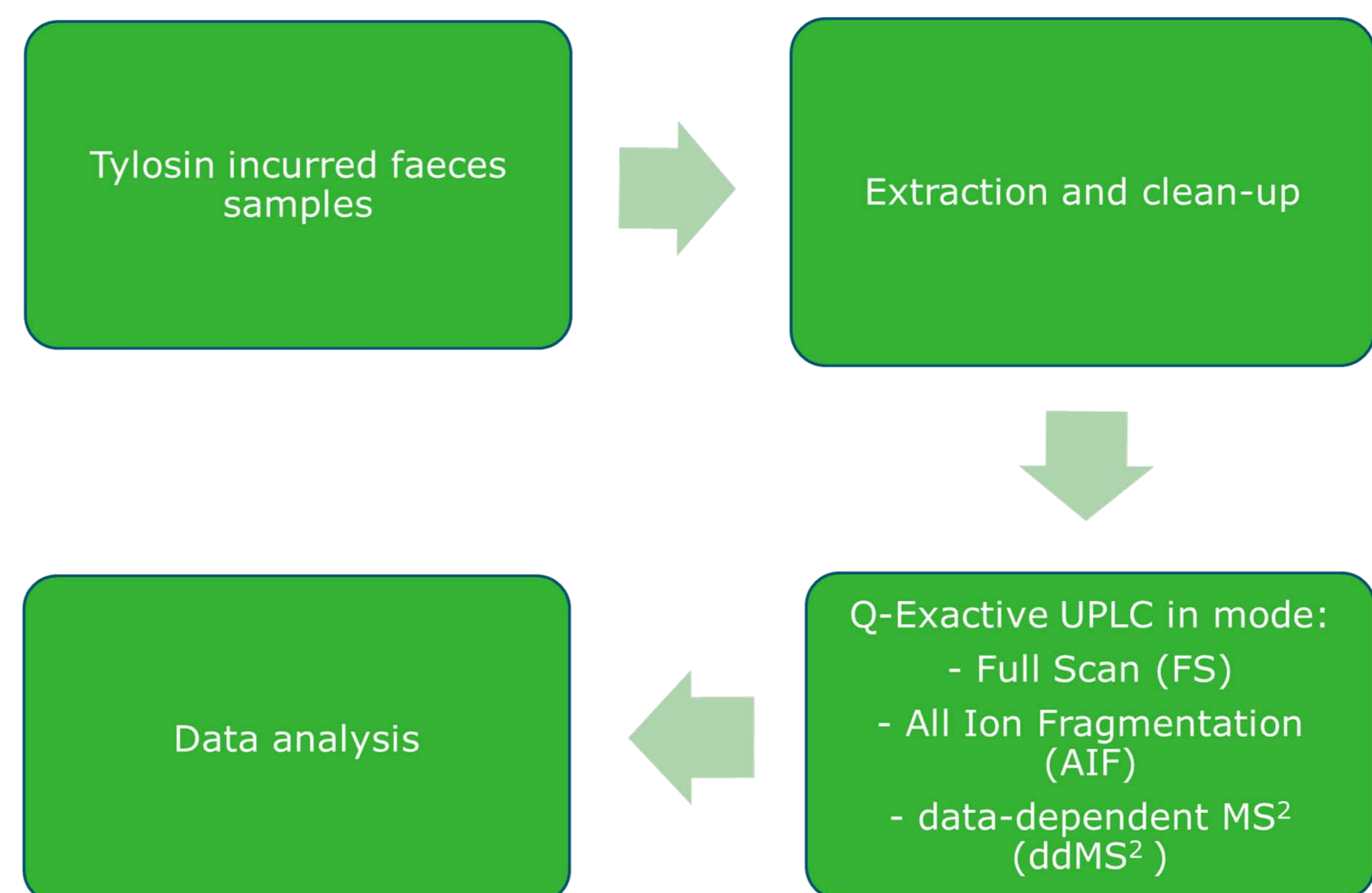
Background

The monitoring of antibiotics focuses on MRL enforcement in food products of animal origin. In order to extend the monitoring to enforce antibiotic use in general and to determine the exposure of antibiotics in the environment, research was done on manure.

Objective

- Detection of tylosin metabolites and degradation products as marker for tylosin use
- Contribution of tylosin metabolites to environmental exposure
- Use of manure as a non invasive sampling method

Method



Results

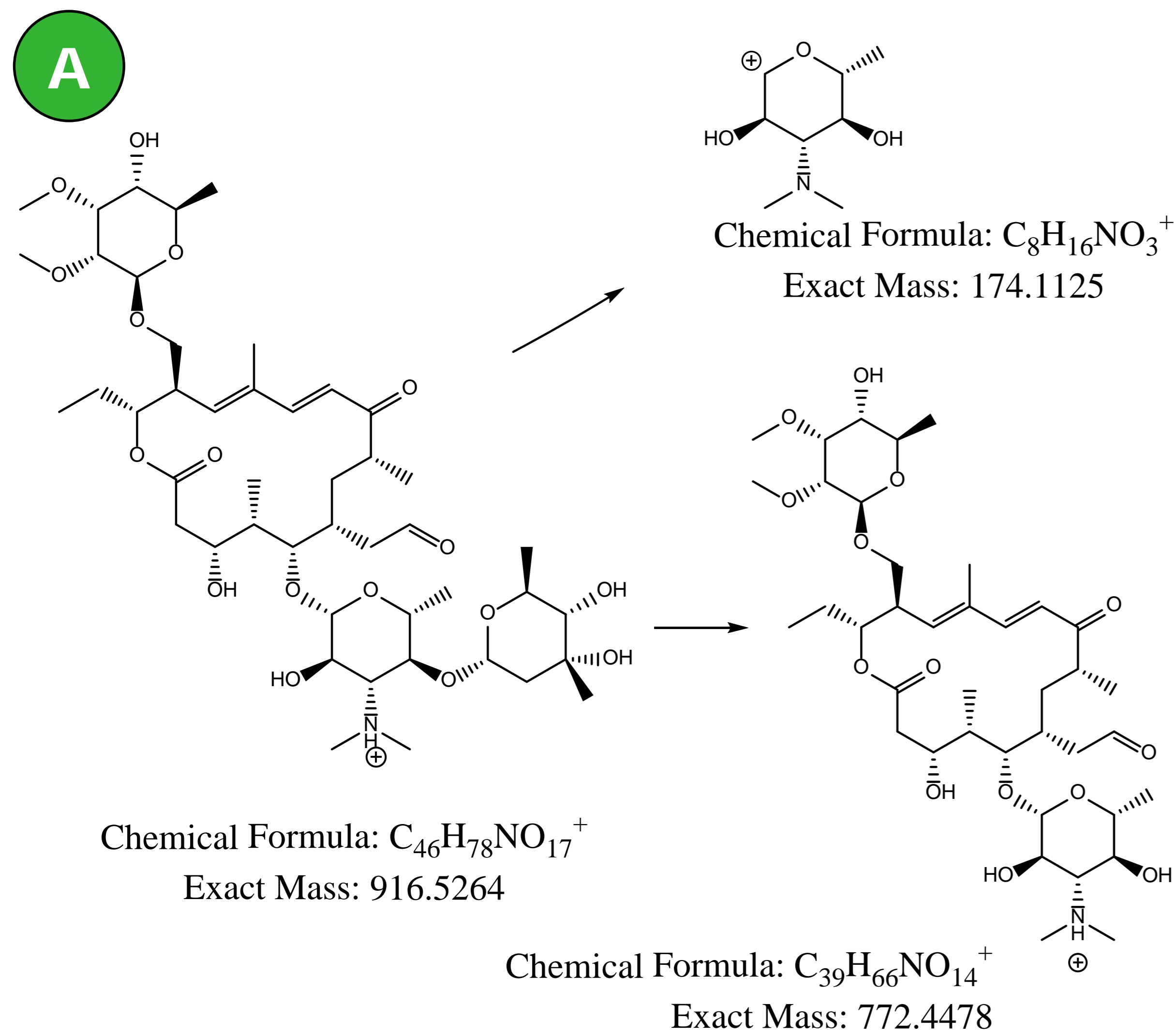


Figure 1. Mass fragmentation spectrum of tylosin A

C

Table 1. Estimated concentration of tylosin and metabolites in manure samples

Component	Concentration in manure ($\mu\text{g}/\text{kg}$)					
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Tylosin A	ND	ND	ND	ND	26	24
Tylosin A isomer	28	21	41	ND	460	500
Hydroxy tylosin A	430	390	90	ND	1700	1100
Tylosin B	ND	ND	24	ND	150	300
Hydroxy tylosin B	35	130	46	ND	420	570

ND = not detected

B

The proposed fragmentation scheme, based on full scan and dd-MS² analysis of tylosin A is shown in figure 1. The product ion m/z 174.1125 is observed for tylosin A, as well as for tylosin B and C (data not shown). This product ion is used as a marker to detect unknown tylosin metabolites and/or degradation products. Beside the parent compounds tylosin A and B, hydroxy metabolites and a tylosin isomer were tentatively identified in manure (figure 2). Analysis of these compounds in incurred manure samples shows that the concentration levels of especially the hydroxy metabolites is relatively high (table 1).

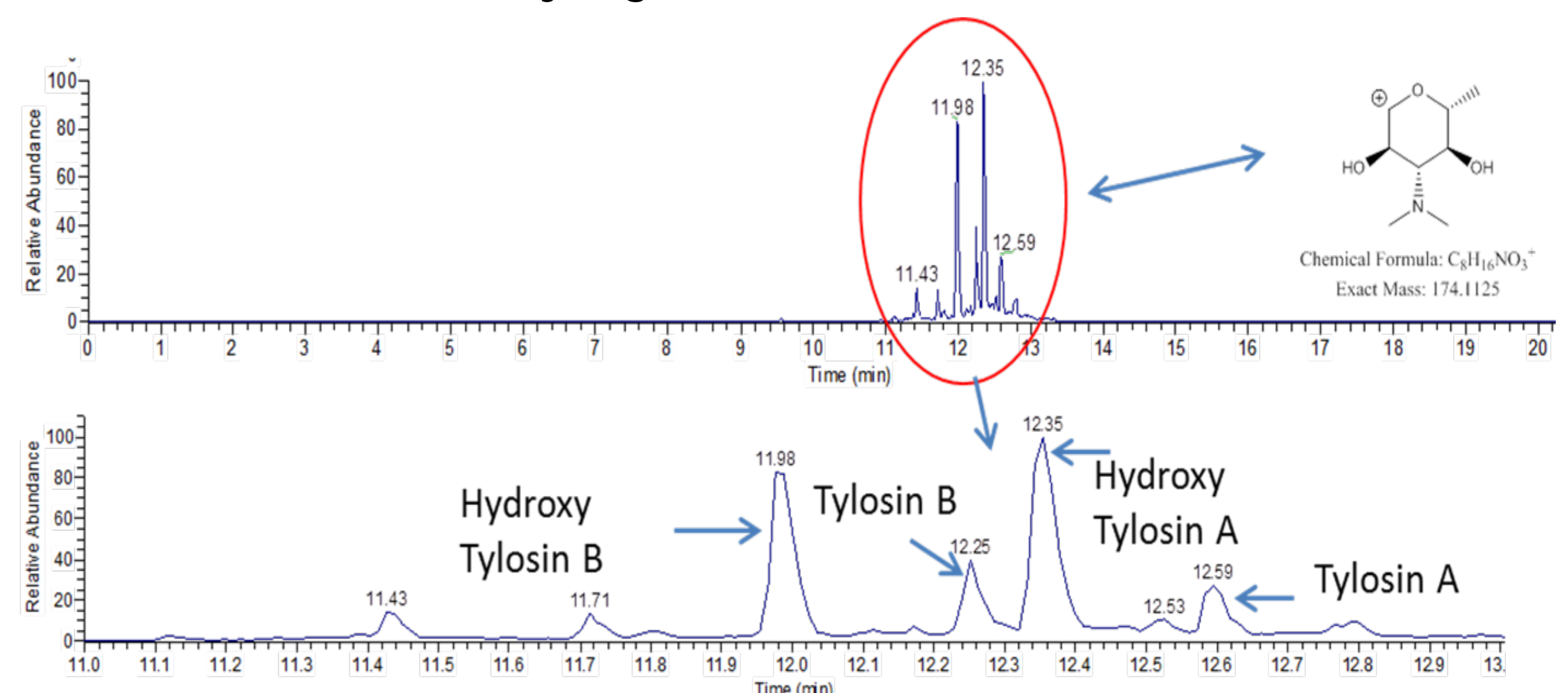


Figure 2. Extracted chromatogram in AIF mode of product ion m/z 174.1125 in an incurred manure sample.

Conclusions

- The contribution of tylosin A in manure samples is relatively small
- Include the hydroxy metabolites for monitoring tylosin treatment
- To determine the effects on bacterial resistance and exposure to the environment, the contribution of the tylosin metabolites and/or degradation products must be taken into account

Acknowledgements

This study was financially supported by the Dutch Ministry of Economic Affairs

