Determination of Coccidiostats in Feedstuff Using LC-MS/MS

Application Note

Food Testing and Agriculture

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Introduction

Coccidia are internal parasites of the genus *Eimeria*. They infect the gut of farm animals and are of veterinary importance because they cause loss of body weight and sometimes death. The prevention and treatment of a coccidial infection can be accomplished by the addition of antibiotic coccidiostats to feedstuffs. However, the introduction of these compounds into the human food chain has led to concern. Therefore, legislation in some authorities defines the maximum residue limits for coccidiostats.

This application note describes the separation of some coccidiostats by LC-MS/MS using an Agilent Pursuit XRs Ultra 2.8 column.

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Results and Discussion

Figure 1 shows the separation of six coccidiostats in less than 14 minutes. Calculating the ratio of the qualifier ion to the quantifier ion can be used to clearly identify the respective coccidiostat.

Peak identification

1. Lasalocid-Na
2. Monensin-Na
3. Salinomycin-Na
4. Maduramycin-Na
5. Narasin-Na
6. Nigericin-Na (IS)

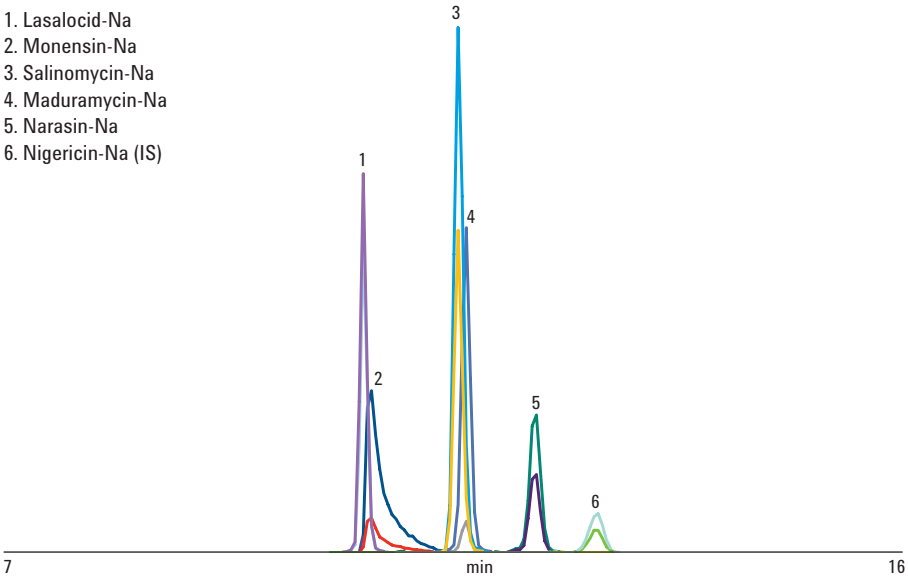

Figure 1. Multiple reaction monitoring (12 pairs) of matrix-matched standard coccidiostats at 900 ng/mL.

Conditions

Sample	Standard coccidiostats
Sample solvent	Methanol
Column	Agilent Pursuit XRs Ultra 2.8 C18, 2.0 × 50 mm, 2.8 µm (p/n A7501050X020)
Mobile phases	A: Acetonitrile/water 60:40 + 0.02 M sodium acetate B: Acetonitrile/methanol/THF/water (67:10:10:13) + 0.1% formic acid + 0.02 M sodium acetate
Gradient	0-5 min 100% A, 7-20 min 100% B, 21-25 min 100% A
Flow rate	0.3 mL/min
Temperature	25 °C
Pressure	80-110 bar
Injection volume	20 µL
Concentration	0.05-0.9 mg/L
Detector	MS/MS (detection of sodium adducts)

Conclusions

Several coccidiostats were successfully resolved using LC-MS/MS with the Agilent Pursuit XRs Ultra 2.8 C18 column. This column is designed around an optimized 2.8 µm particle and advanced packing procedure. The ultrapure silica particles deliver 10-15% higher efficiency than 3 µm columns, with reduced runtime and good resolution.

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