

Fast screening of veterinary drugs in food of animal origin using pSPE-HRMS

Highlights

- ✓ Residues found in food through an improper usage are hot topics in food safety, public health and environmental fields.
- ✓ Rapid and streamlined analysis of 31 veterinary drugs out of 6 different substance classes in food of animal origin
- ✓ Analysis time substantially reduced by 50 %: parallel analysis of 13 food samples took 6 h *versus* 2 full days for the current analysis
- ✓ All planar SPE (pSPE) steps on the same HPTLC plate in parallel for 13 food samples: application as rectangle, effective clean up of 31 antibiotics/corticosteroids in 4 different typical animal food matrices, focussing and eluting these analytes into target zones
- ✓ Quantitative elution of the target zones containing 25 different antibiotics or 6 corticosteroids via an elution head-based interface directly into HRMS

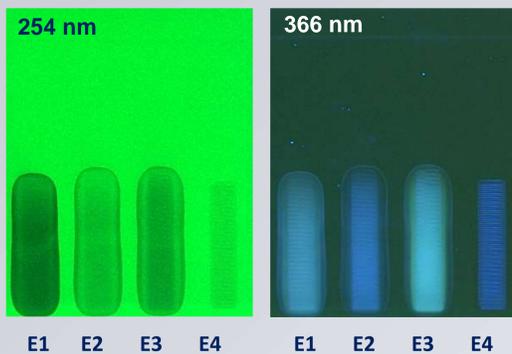
Comparison of analysis times

Workflow steps	HPTLC	Workflow steps ¹	HPLC ¹
	Time [min]/ 4 samples		Time [min]/ 4 samples
Application	12	Clean up	20 x 4
Focussing 1	23	Concentration	10 x 4
Focussing 2	42	Preparation solutions	5 x 4
Elution into HRMS	50	Measurement	10 x 4
Evaluation	60	Evaluation	40 x 4
Sum	187 (3 h)	Sum	340 (6 h)

¹Information obtained by LUA, Chemnitz, Germany

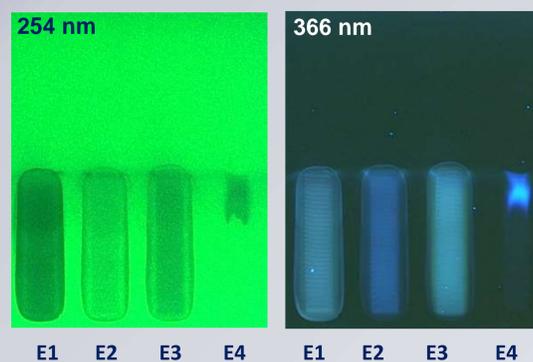
Application

Application area 6 mm x 30 mm
Dosage speed 1200 nL/s
Needle temperature 60°
Application volume 100 µL extract



Focussing 1

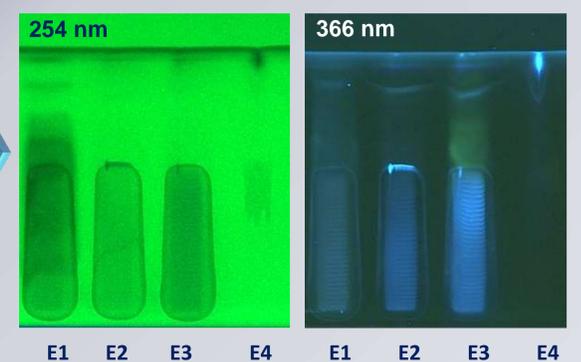
using isopropanol



Muscle + antibiotics (E1)
Milk + antibiotics (E2)
Egg + antibiotics (E3)
Muscle + corticosteroids (E4)

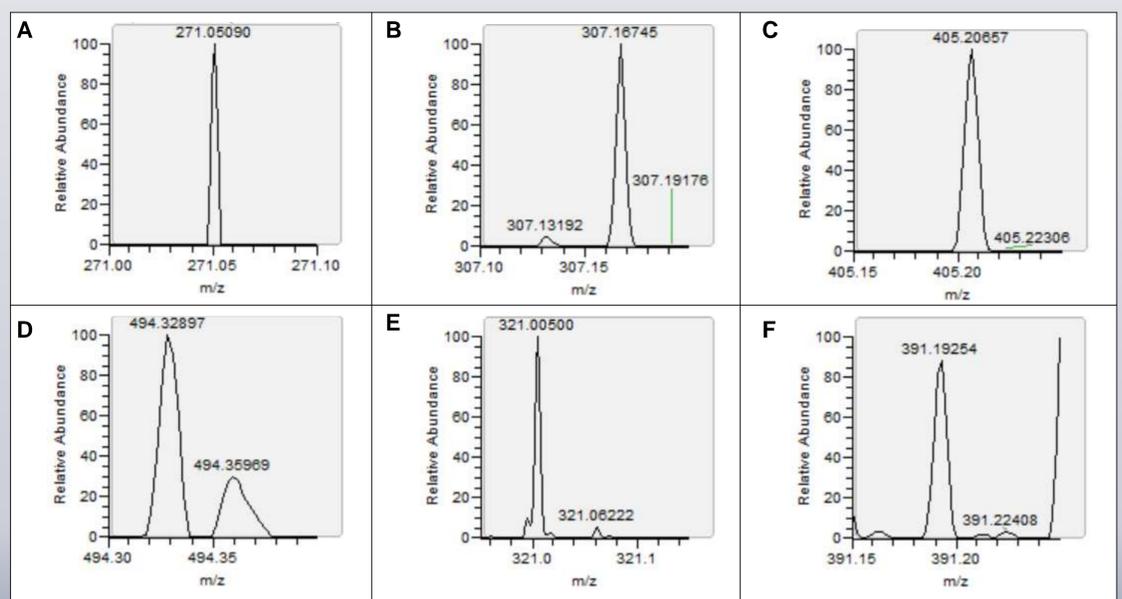
Focussing 2

using acetone – ammonia, 25%



Characterization and identification via HRMS

- Veterinary drugs in the target zones were eluted with methanol into the HRMS and ionized both, in the negative and positive ESI mode.
- Exemplarily, one veterinary drug representative out of the 6 different substance classes in muscle extract at 5 ng/ 100 µL is shown:
 - Dapson [M+Na]⁺, *m/z* 271.05090
 - Baquiloprim [M-H]⁻, *m/z* 307.16745
 - Lincomycin [M-H]⁻, *m/z* 405.20657
 - Tiamulin [M+H]⁺, *m/z* 494.32897
 - Chloramphenicol [M-H]⁻, *m/z* 321.00500
 - Betamethason [M-H]⁻, *m/z* 391.19254



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