

# Rapid Analysis of Quinolone Antibiotics in Beef Using the Hitachi LaChromUltra® U-HPLC System with Fluorescence Detection

Hitachi High Technologies America, Inc.

**Q**uinolones are a class of synthetic antibiotics used in livestock and fishery products. If overused or used immediately before shipment, trace amounts may remain in animal tissues. As a result, action levels and maximum residue limits for quinolone antibiotics have been established for these products by many food safety organizations worldwide. Here, eleven types of common quinolones were analyzed in beef in under 10 minutes using the Hitachi LaChromUltra liquid chromatography system with fluorescence detection. Excitation and emission wavelengths were changed at 3.6 minutes to optimize the detection of all eleven components.

## Experimental Conditions

Module	Conditions
Pump (L-2160U)	Mobile Phase A: 4 mM SDS, 30 mM NaH <sub>2</sub> PO <sub>4</sub> , pH 2.5 Mobile Phase B: CH <sub>3</sub> CN Gradient: 28-38% B in 10 min. Flow Rate: 0.50 mL/min
Autosampler (L-2200U)	Injection Volume: 2 µL
Oven (L-2300)	Temperature: 40 °C
Detector (L-2485U)	(0-3.6 min.) Ex.: 325 nm, Em.:365 nm (3.6 -10 min.) Ex.:290 nm, Em.:450 nm
Column	Hitachi LaChromUltra C18, 2 µm, 2.0 x 100 mm
Standard	Mixture of 11 quinolone antibiotics

## Results: Performance

Linearity (R <sup>2</sup> ): 0.05 – 5 mg/L	0.9998 – 1.0
Reproducibility (% RSD) N = 6	2.06 – 4.30

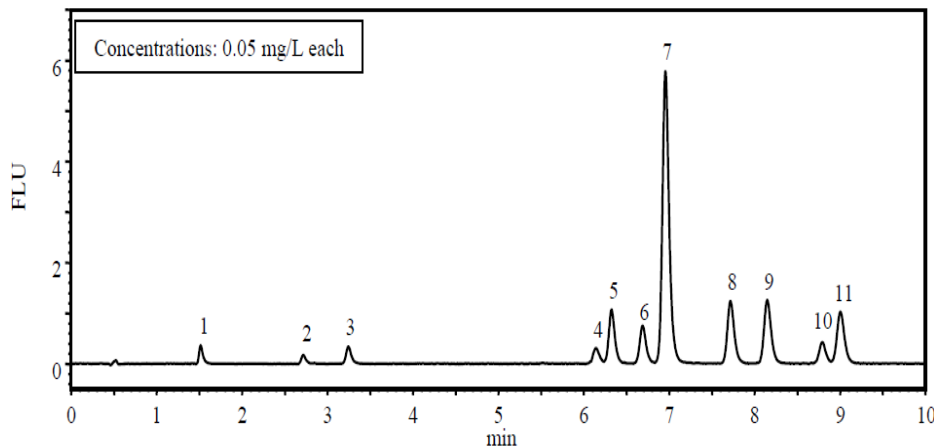
## Reference:

1 – Technical Data LCU090028, Hitachi High Technologies Corporation.

\* LaChromUltra is a registered trademark of Hitachi High Technologies America.

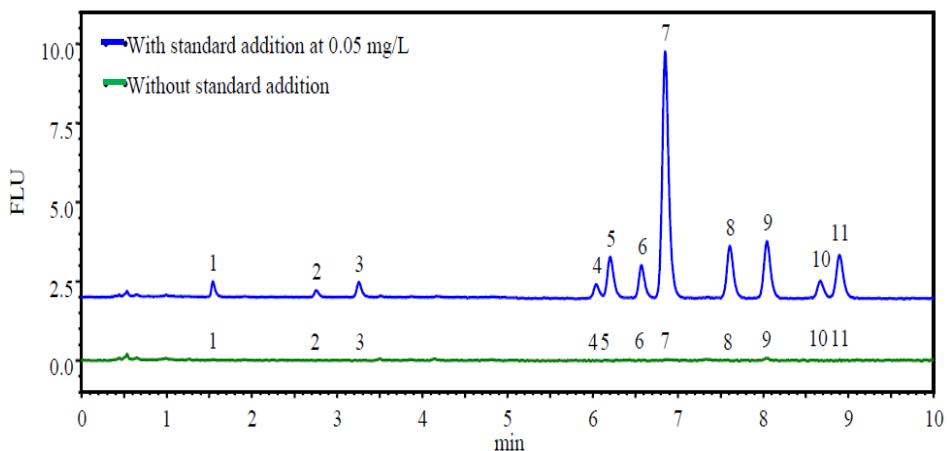
## Results – Chromatograms of Quinolone Antibiotic Standards and Samples

11-Component Mixture: 1.oxolinic acid, 2. nalidixic acid, 3. flumequine, 4. ofloxacin, 5. norfloxacin, 6.ciprofloxacin, 7. danofloxacin, 8. enrofloxacin, 9. orbifloxacin, 10. sarafloxacin, 11. difloxacin



## Beef Extraction Liquid and Spiked Beef Extraction Liquid

In this sample, none of the eleven quinolone antibiotics were present.



## Discussion

Hitachi's LaChromUltra® liquid chromatography system is effective at rapid analysis of quinolone antibiotics in beef and fish products. Good separation of 11 components is observed within 10 minutes in both a standard solution and a beef extraction liquid spiked with the antibiotics. The system exhibits a linear response over a broad concentration range and excellent reproducibility.

## Hitachi High Technologies America, Inc.

Life Sciences Division  
 5100 Franklin Drive  
 Pleasanton, CA 94588  
 Toll Free: (800) 548-9001