

NEW!



LC-MS/MS ANALYSIS OF TETRACYCLINE RESIDUE in MILK, MEAT, HONEY and FISH

Jasem® Method: Accuracy – High Speed – Simplicity in New Dimensions !

® Patent pending

Tetracyclines (TCs) are broad-spectrum antibiotics, widely used in animal husbandry and apiculture for prevention and treatment of diseases and as growth promotion. When TCs used for fish it is usually expected to remedy topical diseases of the skin, such as ulcers or fin rot. In food-producing animals, tetracyclines can be administered orally through food or drinking water, parenterally, or by intramammary infusion.

In cattle, a frequent source of milk contamination is intramammary administration and milk tetracyclines contents reach 50-60% concentrations of those in blood plasma.

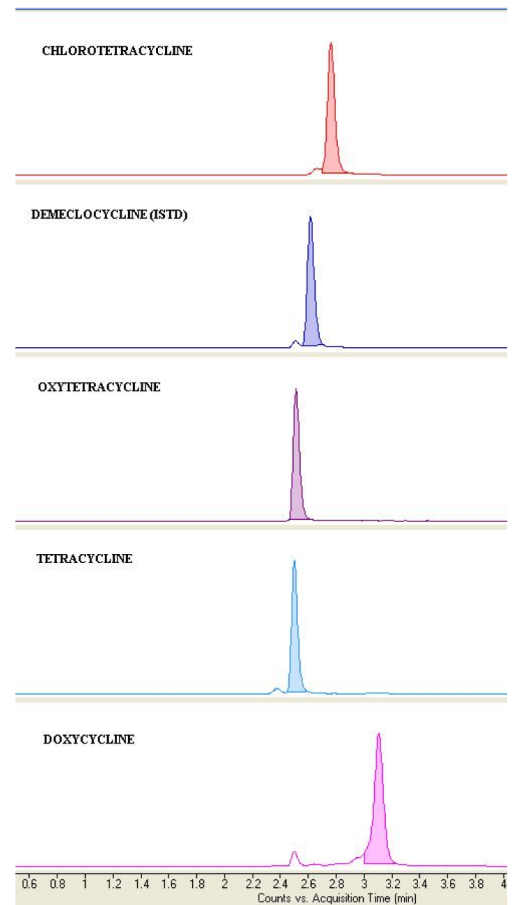
Extracted ion chromatogram of 100 ppb tetracyclines mix spiked milk sample

Features of Jasem® method

- Very easy sample preparation
- No need for SPE or Liquid-Liquid extraction
- Short run time
- Excellent separation of epimers
- Preventing source contamination by using diverter valve

Benefits & Advantages of Jasem® method

- Fast and easy sample preparation time
- Lower cost sample preparation step
- Shorter run time
- Better repeatably than ref. methods
- More accurate results because of lower RSD typical lower than 2%
- MS/MS method more selective than standard HPLC-UV method



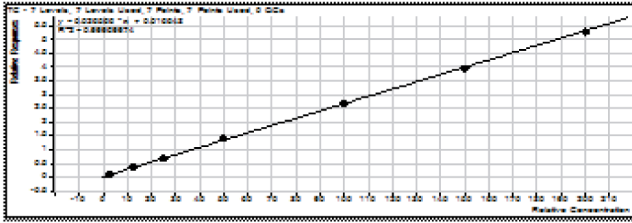
Tetracycline antibiotics:

*Tetracycline,
Chlorotetracycline,
Oxytetracycline,
Doxycycline,
Demeclocycline-ISTD.*

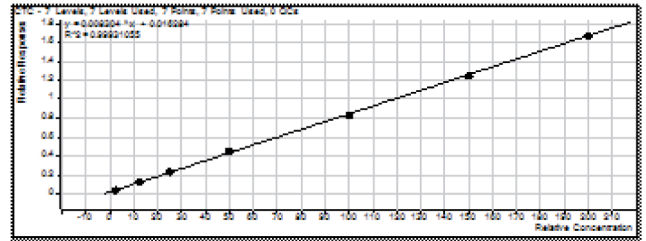


JASEM LABORATUVAR SİSTEM VE ÇÖZÜMLERİ SANAYİ VE TİCARET A.Ş.

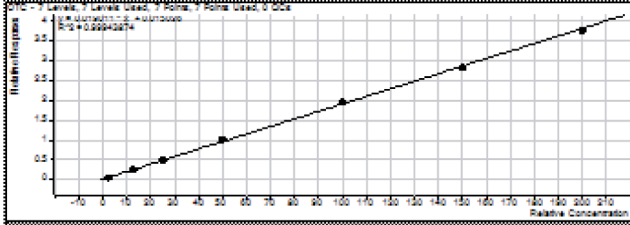
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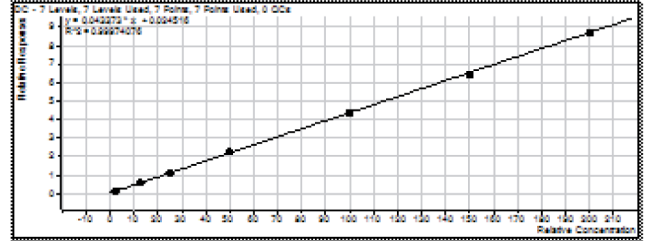
Tetracycline calibration curve from 2.5 ppb to 200 ppb



Chlortetracycline calibration curve from 2.5 ppb to 200 ppb



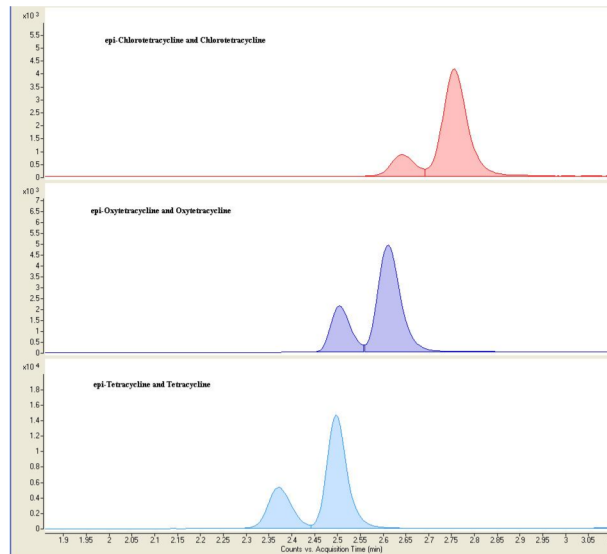
Oxytetracycline calibration curve from 2.5 ppb to 200 ppb



Doxycycline calibration curve from 2.5 ppb to 200 ppb

Tetracyclines have their degradation products, 4-epi-tetracycline, 4-epi-chlortetracycline and 4-epi-oxytetracycline. The epimers differed significantly from the analogues of normal configuration in several of their properties, the most important being their in vitro antibiotic activity. This was found to be less than 5% of the activity of the normal analogue.

Separation of epimers



Cattle and Poultry Meat

Present Reference Method: AOAC (Association of Official Analytical Chemists) Official Method 995.09 "Chlortetracycline, Oxytetracycline and Tetracycline in Edible Animal Tissues". This method is isocratic Metal-Chelate Affinity-Liquid Chromatographic Method with 3 hours sample preparation time and 12 minutes HPLC run time.

Jasem® Method: Only 11 minutes sample prep time and 7 minutes LC-MS/MS run time.

Milk

Present Reference Method: AOAC (Association of Official Analytical Chemists) Official Method 995.04 “Multiple Tetracycline Residue in Milk”. This method is Metal-Chelate Affinity-Liquid Chromatographic Method with 1.5-2 hours sample preparation time and 24 minutes HPLC run time.

Jasem[®] Method: Only 4 minutes sample prep time and 7 minutes LC-MS/MS run time!

Honey

Present Reference Method: Journal of AOAC International, 2002, Vol.85, No.4 “Quantitative LC/MS-MS Determination of Sulfonamides and Some Other Antibiotics in Honey”. This method is LC-MS/MS Method with more than 1 hour sample preparation time and 19 minutes run time.

Jasem[®] Method: Only 2 minutes sample prep time and 7 minutes LC-MS/MS run time !

Compound	Milk			Honey			Cattle meat			Chicken meat		
	R2	LOQ (ppt)	LOD (ppt)	R2	LOQ (ppt)	LOD (ppt)	R2	LOQ (ppt)	LOD (ppt)	R2	LOQ (ppt)	LOD (ppt)
Chlortetracycline	0.9993	51	17	0.9998	23	8	0.9994	48	16	0.9987	86	28
Oxytetracycline	0.9994	40	13	0.9994	35	12	0.9991	39	13	0.9995	85	28
Tetracycline	0.9996	24	8	0.9998	47	16	0.9996	32	11	0.9988	182	60
Doxycycline	0.9997	20	7	0.9994	20	7	0.9994	27	9	0.9997	32	11

Why is all over the world interest in Tetracyclines analysis so rapidly growing ?

Tetracycline antibiotics can cause to some health problems such as permanent stained teeth, increased sunburn under exposure to light from the sun, and other chronic effects include nephrotoxicity, hepatotoxicity, hypersensitivity reactions.

In order to prevent any harmful health effects on consumers, World Health Organisation (WHO) and European Union (EU) established the Maximum Residue Limits (MRL) for veterinary drugs. In the EU, the MRL for tetracyclines is at 100 µg/kg for milk and 100, 300, 600 µg/kg for muscles, liver, and kidney, respectively. In the other hand, there are no MRLs established for antibiotics in honey according to the European Community regulations which means that honey containing antibiotic residues are not permitted to be sold.