Improving the Consistency and Accuracy of Tetracyclines Regulatory Laboratory Testing of Contaminated Beef, Chicken, and Cow’s Milk with Simple Automation and New Consumables Technology

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Tetracyclines are one of the most commonly used antibiotic agents in the United States. A majority of the usage is for agricultural purposes, where it is estimated 80% of tetracyclines administered is for disease prevention in healthy animals. They are also used in farming to keep animals raised in close proximity healthy and gaining weight. In 2012, the FDA indicated, tetracycline accounted for 41 percent of the 31 million pounds of antibiotics sold for farm animals in the United States. While the use of tetracyclines is very beneficial for the production of agriculture products, there are concern about long term adverse health effects for humans. Evidence has shown repeated exposure to low levels of tetracyclines through food sources has lead to antibiotic resistant effects for humans. Since the structures are so similar, a pathogen treated with one of these compounds may develop resistance to many.

Tetracycline class antibiotics easily form epimers which must be accounted for in assays. The goal of this work is to develop a routine method using modern automation technology and consumables for the measurement of tetracyclines.

Experimental

Samples Evaluated
- Beef
- Chicken
- Low-fat Fish
- High-fat Fish
- Milk
- Milk-based infant formula

Sample Prep Protocol

Tetracycline Chromatography

Results and Discussion

Conclusions