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Liquid chromatographic screening of packaged meat products for enrofloxacin residue

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Abstract

The present study was undertaken to monitor packaged meat products for Enrofloxacin residues using Ultra High Performance liquid Chromatography (UHPLC). A total of 60 samples of packaged chicken sausages, chicken meat balls and chicken nuggets were collected for the study. The samples after collection were preserved at -20 °C. Analyses of the samples were done using Ultra High Performance Liquid Chromatography with Diode Array Detection system. Recovery ranged from 85-97%. No residue of enrofloxacin was detected in any of the screened samples. The samples were safe for consumption as per public health point of view.

Keywords: Enrofloxacin, Monitoring, Residues, UHPLC.

1. Introduction

Enrofloxacin is a broad spectrum antimicrobial agent which is widely used in veterinary medicine (Nouws *et al.* 1988) [4]. Enrofloxacin residues are reported in animal tissues (Schneider, 2001; Cornejo *et al.*, 2011) [5, 2]. The indiscriminate use of this agent possesses a considerable risk due to the presence of residues in meat and meat products meant for human consumption. The FAO/WHO have recommended Maximum Residue Limits (MRL) for Enrofloxacin in animal tissues (FAO/WHO, 2002) [3]. Packaged meat products like sausages, meat balls and nuggets are considered as important food item and has become popular in recent times. There may be every chance of presence of drug residues in such products. Thus the present study was undertaken to monitor packaged meat products for Enrofloxacin residues available in local shops of Guwahati city using Ultra High Performance liquid Chromatography (UHPLC).

2. Materials and methods

A total of 60 samples (twenty each) of chicken sausage, chicken meat balls and chicken nuggets were collected from local shops of Guwahati city. The samples were then stored at -20°C till the time of processing. Screening and analysis of samples for the presence of Enrofloxacin residues was performed with Ultra High Performance Liquid Chromatography (UHPLC) system with diode array detector. The mobile phase consisted of mixture of water, acetonitrile and tetraethylamine (83:14:0.45 v/v). Enrofloxacin was eluted under isocratic conditions. The excitation/emission wavelengths used for the UV detection was 277 nm for Enrofloxacin. Enrofloxacin standard (Sigma), HPLC grade acetonitrile, HPLC grade water and other chemicals and solvents of analytical grade were used for the study. About 10 g of the sample with equal volume of distilled water was taken in a tissue blender and mixed. Ten grams of each blended sample was transferred in a beaker. After few minutes 10 ml of acetonitrile was added and left undisturbed for 10 min. The sample was then sonicated with the help of Ultrasonicator. The samples were then centrifuged at 10,000 rpm at 0 °C and the collected supernatant was filtered using Whatman Filter paper. The filtrate was passed through solid phase extraction procedure using a C₁₈ polymeric cartridge after which it was further filtered using 0.22µm nylon filter paper.

3. Results and discussion

In the present study, linear calibration curve of Enrofloxacin standard having correlation coefficient (R²) of 0.999 was obtained. This was similar to that reported by Cinquina *et al.*, 2003^[1]. The separation of the analytes was achieved in less than 5 mins. Acetonitrile was effective in the deproteinization of the samples and in the isolation of analytes from spiked samples. This method allows the determination of residues of Enrofloxacin in different matrices with higher sensitivity. Recovery of enrofloxacin in spiked samples ranged from 85-97%. This finding was in similar line as that reported by Cinquina (*loc cit.*) where average recovery was 88%. After screening all the samples of chicken sausage, chicken meat balls and chicken nuggets, residue of enrofloxacin was not detected in any of the samples. This may be due to absence of the drug in the meat products.

4. Conclusion

It can be concluded from the present study that the samples of chicken sausages, chicken meat balls and chicken nuggets may be considered as safe and free from enrofloxacin residue, all though there is every need of monitoring these products from time to time.

5. References

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