



# **DETERMINATION OF ANTIBIOTIC RESIDUE IN MILK AND ITS PUBLIC HEALTH SIGNIFICANCE**

**MD. Sahidur Rahman**

Roll No: 0118/05

Registration No: 602

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**A thesis submitted in partial fulfillment of the requirements for the degree of  
Masters in Public Health**

**One Health Institute  
Chattogram Veterinary and Animal Sciences University  
Chattogram-4225, Bangladesh**

**December 2019**

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MD. Sahidur Rahman

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-----  
**Supervisor**

Prof. Dr. Sharmin Chowdhury

-----  
**Co-supervisor**

Prof. Dr. Mohammad Mahmudul Hassan

-----  
**Director, One Health Institute**

**One Health Institute**

**Chattogram Veterinary and Animal Sciences University**

**Chattogram-4225, Bangladesh**

**December 2019**

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**Roll number:** 0118/05

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## List of symbols and abbreviations

AOAC	: Association of Official Analytical Chemists
ADI	: Acceptable Daily Intake
CI	: Confidence interval
EDI	: Estimated Daily intake
Fig	: Figure
i.e.	: That is
Kg	: Kilogram
Mg	: Milligram
Min	: Minutes
ml	: Milliliter
MRL	: Maximum residue limit
N	: Number of positive samples
N	: Total number of samples
OTC	: Oxytetracycline
°C	: Degree Celsius
SD	: Standard Deviation
Sec	: Seconds
viz	: Namely
wt	: Weight
%	: Percentage
µg	: Micro Gram
>	: More than
<	: Less than

## **Abstract**

Veterinary antibiotic residue in milk is a serious public health concern especially when present above the maximum residual level (MRL). It causes bioaccumulation of drug residues in human body might lead to the condition of antibiotic resistance, antibiotic allergy and disruption of normal flora in intestine. Besides, residual antibiotics may also influence starter cultures in dairy food industry and deteriorate the quality. A cross-sectional study was designed to qualitative and quantitative determination of antibiotic residue in raw and processed milk and its public health significance at Chattogram Bangladesh. A standard questionnaire was developed and supplied to a total of 101 farm owners to assess the perspective of farmers regarding antimicrobial use and its residue. Residues of five commonly used veterinary antibiotics were measured in about 300 raw and processed milk samples using thin layer chromatography (TLC) and ultra high performance liquid chromatography (UHPLC) method. Study revealed that the prevalence of antimicrobial residues was higher (6%) in individual milk samples than the pooled samples (4%). However, no processed packet milk samples were detected as positive. The mean concentration of oxytetracycline and amoxicillin was found 61.29  $\mu\text{g/l}$  and 124  $\mu\text{g/l}$  in milk, respectively. Hazard Quotient based risk analysis showed the estimated daily intake of oxytetracycline (0.0056  $\mu\text{g}$ ) and amoxicillin (0.0017  $\mu\text{g}$ ) residue against 165 ml per capita milk consumption is lower than the accepted daily intake which is 30  $\mu\text{g}$  and 200  $\mu\text{g}$  respectively. Results generated might enrich the database about the status and associated risk of milk produced and marketed in the region. Large scale continuation of this study is necessary to provide the basis for the development of national action plan through One Health approach aiming the knowledge and skill development of farmers, veterinarians and other stakeholders regarding production and marketing of safe milk to ensure better public health security.

**Keywords:** Antibiotic residue, raw and processed milk, TLC, UHPLC, public health