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Investigation of recombinant thanatin effects on the growth inhibition of e. coli mastitis in dairy cows

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Abstract

Introduction

Mastitis is one of the most prevalent and costly diseases in dairy cattle industry. unfortunately, using common antibiotics to treat this infection is increasing in which leads to undesirable side effects such as antibiotic residuals in milk and occurrence bacterial resistance to antibiotics. therefore, researchers are searching for an alternative to traditional antibiotics with fewer side effects like herbal extracts and antimicrobial peptides (amps). thanatin is one of the member of cationic amps that have received a great attention regarding growth inhibitory against wide range of microorganisms including gram-negative and gram-positive bacteria, as well as several fungi species.

Methods

This recombinant peptide was prepared through previous studies at the department of animal science, ferdowsi university of mashhad. e. coli was isolated from of holstein cows. minimum inhibitory concentrations (mic) was used based on a microbroth dilution method by 96-well microtiter with four replications. after mic, e. coli bacteria on mueller hinton agar medium was cultured and minimum bactericidal concentration (mbc) was determined as that showing no growth.

Results

The results of mic assay showed a strong activity against e. coli bacteria with the value of mic equal to 6 µg/ml. negative control did not show any growth inhibitory on e. coli. moreover, the amount of mbc of this bacteria was observed approximately 12 µg/ml.

Conclusion

Thanatin showed a strong growth inhibitory against e. coli. antimicrobial peptides are considered to be future alternatives for broad-spectrum antibiotics for treatment a wide range of bacterial diseases. considering adverse effects of mastitis on human health through transferring drug resistant bacteria from cows to human, it is important to replace antibiotics with compounds which have lower chance of developing resistance such as amps.

Keywords

E. coli, bacterial infection, antimicrobial peptides, antibiotic resistant