

The impact of some host and environmental factors on the role of increased serum survival (*iss*) virulence gene in bovine mastitis pathogenic *Escherichia coli*

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Heading

The effect of *E.coli iss* virulence gene on the bovine mastitis

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From many *E. coli* factors, this study addresses the hypothesis that increased serum survival (*iss*) virulence gene can affect the bovine mastitis characters. Furthermore, some environmental and host conditions can play a role as an intervening variable. Milk samples of 80 clinical and 20 subclinical mastitis cases infected with *E. coli* were collected from Holstein dairy farms in Garmsar, Iran. The isolated bacteria were checked for the presence of *iss* gene with polymerase chain reaction (PCR), and for *E. coli* colony count. Results showed that 45 out of 100 cases showed less than 500 colony for unit (CFU), and were encountered as a control group, and 55 out of 100 cases showed more than 500 CFU, and were encountered as a test group. The *iss* gene was isolated from 13 out of 45 (29%) of the cases in the control group ($P>0.05$), and from 11 out of 55 (20%) in the test group ($P>0.05$). However, peracute mastitis in the control group was the only degree of mastitis that *iss*-negative *E. coli* was not detected in it. There was also no correlation between the isolation of *iss* gene and mastitis grades ($P=0.7$), *E. coli* colony count ($P=0.3$), and somatic cell count (SCC) ($P=0.8$). However, a negative correlation between the expression of *iss* gene and milk production was found ($P<0.05$) only in the test group. In clinical cases, the correlation between the presence of *iss* gene and different seasons of the year was significant only in the test group ($r=0.465$, $p=0.01$). It is concluded that the *iss* gene may be effective in the induction and development of *E. coli* mastitis only in warm seasons and low producing cows. Furthermore, *E. coli* pathotype with less than 500 CFU and containing *iss* gene may be a mastitis pathogen.