

Quantification of Biofilms by *Salmonella*, *E. coli* and *Proteus Spp*

S.U. Pathirana¹, D.N.N. Madushanka¹, K.V.D.M. Hasintha¹, H.C. Nadishani¹,
G.C.P. Fernando², T.S.P. Jayaweera¹, and H.A.D. Ruwandeepika^{1*}

¹Department of Livestock Production, Faculty of Agricultural Sciences, Sabaragamuwa
University of Sri Lanka, Belihuloya, Sri Lanka

²Department of Bio systems Technology, Faculty of Technology, Sabaragamuwa University
of Sri Lanka, Belihuloya, Sri Lanka

*ruwandeepika@yahoo.co.uk

A biofilm is a microbial community attached to a surface which embedded in a self-producing complex extra polymeric matrix of polysaccharide, protein and DNA. Biofilms gain special attention as it causes chronic infection, chronic source of contaminations due to its role in development of resistance to antibiotics, disinfectants and resisting phagocytises. This study focused on isolating *Salmonella*, *E.coli* and *Proteus* spp from broiler chicken meat and investigating their ability of forming biofilm. Organisms were isolated from 50 samples of broiler chicken meat collected from retailer shops. Subsequently, the isolates (10 *Salmonella* isolates, 3 *E. coli* isolates and 1 isolate of *Proteus*) were checked for their ability to form biofilms with two different nutritional conditions (Undiluted Luria-Bertainy (LB) broth and 1:100 diluted LB broths) at 37^o C for 24 hours by micro titre plate assay. The study revealed that there are four strong, five moderate and five weak biofilm formers in nutritionally rich undiluted medium where as one strong, nine moderate, two weak and two no biofilm formers in nutritionally diluted medium. Among the 10 *Salmonella* isolates, there were three strong, five moderate and two weak biofilm producers in undiluted condition whereas one strong, seven moderate and two weak *Salmonella* biofilm producers in diluted LB medium. All the three *E. coli* isolates tested were weak biofilm formers in nutritionally rich medium. Two out of three *Coli* isolates did not produce any biofilm in the diluted medium but the other isolate showed moderate biofilm formation. The *Proteus* isolate showed its ability to form strong biofilm in nutritionally rich condition and moderate biofilm formation in diluted medium. Some isolates formed strong biofilms at nutritionally rich medium whereas some were strong at nutritionally diluted medium. Moreover, the different isolates at similar nutritional environment exhibited variations in biofilm formation. This study concluded that there is a species variation in biofilm forming ability and nutritional conditions of the medium also has different impact on biofilm formation by different bacterial isolates.

Keywords: *Biofilms, E. coli, Proteus, Quantification, Salmonella.*