



The ~~m~~Modern human diet consists of a wide variety of food ~~materials~~ from different sources. The active promotion of fruits and vegetables as ~~an~~ important part of a healthy diet has ~~lead~~ to ~~a~~ significant increase in fresh produce being eaten all over the world. Recent outbreaks of foodborne illnesses related to consuming fresh produce ~~have~~s height~~en~~ed concerns that these foods ~~might~~ ~~may~~ be a ~~source of~~ increased ~~ing~~ source of illness. The minimal ~~processing~~ required for ~~fresh and freshly cut~~ produce, which omits any effective microbial elimination steps, results in food products ~~that~~ naturally carrying microorganisms, some of which ~~may~~ ~~ay~~ ~~be~~ ~~are~~ potentially hazardous to ~~the~~ human health.

Some ~~of the~~ foodborne pathogens like *Salmonella* spp., *E.coli*, *Citrobacter* spp., and *Enterobacter* spp. produce curli, which help ~~in~~ ~~during~~ the initial steps of biofilm formation and enhances the resistance of cells in biofilms ~~for~~ ~~against~~ sanitizers and disinfectants. Curli are proteinaceous components of a complex extracellular matrix ~~and~~ ~~are~~ produced by many *Enterobacteriaceae*. They are thin, coiled fibers expressed ~~on the~~ ~~at~~ surfaces of cells that bind several ~~matrix~~ ~~matrices~~ and plasma proteins such as fibronectin, laminin, plasminogen, and azo dyes like Congo red. Raw vegetables, fruits, and unpasteurized juices contain a number of curli-producing foodborne pathogens ~~which~~ ~~that~~ are associated with food-related diseases. These curli producers form biofilms on fresh produce as well as on food contact surfaces, ~~and~~ ~~resulting~~ in ~~the~~ cross-contamination of produce. Curli-producing bacterial strains are characterized by their ability to bind Congo red, which provides a simple screening method ~~for~~ *in vitro* curli production. The Congo red binding technique has a qualitative ~~approach~~, as well as a quantitative approach. Curli producers were isolated from fresh produce and unpasteurized carrot juice using ~~a~~ modified Luria Bertani (~~LB~~) medium. Curli-producing organisms form dry red rough colonies on modified LB medi~~a~~~~m~~, while nonproducers form smooth white colonies. ~~The~~ ~~p~~Parameters that control curli production, such as temperature and osmolarity, were evaluated using the Congo red binding technique.

Commented [E1]: Consider deleting “and freshly cut” unless there is a noteworthy difference between these terms that you expect the reader will understand.



The ~~ressitance~~resistance of biofilms formed by ~~eurli~~curli-producing organisms was evaluated; ~~it was and~~ found that curli production increases resistance to various commercially used sanitizers.

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