



Research Article

Microbial load and prevalence of pathogens on surface of fresh vegetables in local market yards across Junagadh district of Gujarat

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ARTICLE INFO

Article Chronicle :

Received : 11.11.2011

Revised : 18.12.2011

Accepted : 14.02.2012

Key words :

Contaminants, Pathogens, Total plate count (TPC), Yeast and mould count (YMC), *E. coli*, *Salmonella*, *Vibrio*

ABSTRACT

The vegetables are being grown extensively in India. Minimally processed foods or other raw vegetables have been known to serve as vehicles of human disease for at least a century. Vegetables can be contaminated with microorganisms which are capable of causing human diseases. This study was designed to determine the microbial load and prevalence of pathogens on surface of fresh vegetables from local market yards across Junagadh district. Total 192 fresh raw vegetable sample's microbial load were assessed using the Total Plate Count (TPC) per gram of Vegetables surface. Prevalence of yeast, mould, *Escherichia coli*, *Salmonella* spp. and *Vibrio* spp. was found. Prevalence of *E. coli*, *Salmonella* spp. and *Vibrio* spp. were observed in most of the samples collected from market yards which could pose a health risk to consumers. Generally no pre-treatment was given to fresh produce before transporting to retailer and hence number of contaminants was so large. These high viable counts of local markets could be because of unhygienic handling condition of local market, exposure during transport, improper storage condition etc. and thus may add the load of organisms.

How to view point the article : Parakhia, Manoj V., Dhingani, Rashmin M., Tomar, Rukam S., S.V. Patel and Golakiya, B.A. (2012). Microbial load and prevalence of pathogens on surface of fresh vegetables in local market yards across Junagadh district of Gujarat. *Internat. J. Plant Protec.*, 5(1) : 84-88.

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INTRODUCTION

Raw vegetables have been known to serve as vehicle of human diseases for at least a century. Vegetables can become contaminated with microorganisms capable of causing human diseases while still on the plant in fields or orchards or during harvesting, transport, processing, distribution and marketing or in the home (Beuchat, 1998). Bacteria such as *Clostridium botulinum*, *Bacillus cereus* and *Listeria monocytogenes*, all are capable of causing illness and are normal inhabitants of many soils, whereas *Salmonella*, *Shigella*, *Escherichia coli* and *Campylobacter* reside in the intestinal tracts of animals, including humans and are more likely to contaminate raw vegetables through contact with faeces, sewage, untreated irrigation water or surface water (Abdelnoor *et al.*, 1983). Most of the contaminating flora are non-pathogenic and have a natural occurrence on the produce. However, pathogens from the human and animal reservoir as well as other pathogens from environment can be found at the time of consumption (Altokrusse *et al.*, 1997). The survival of enteric pathogens in

soil, manure, municipal wastes and irrigation water depends on different factors like relative humidity, microbial adhesion, rainfall, sunlight, etc. (De Roeve, 1998 and Francis *et al.*, 1999). Contamination with viruses or parasites can result from contact with faeces, sewage and irrigation water. Vegetables are purchased from local farmers or retail outlets for further preparation by street vendors. Numerous surveys have been carried out in many countries to determine the presence of pathogenic microorganisms on raw fruits and vegetables (Abdelnoor, 1983). In many instances, bacterial pathogens have not been detected. In other investigations, high percentages of samples have been found to contain bacteria capable of causing human disease. Results of these investigations show that the most common pathogens found on surface of vegetables are *L. monocytogenes*, *E. coli*, *Salmonella*, *V. cholerae*, *Staphylococcus* etc. While every effort should be made to prevent contamination of vegetables during production, transport, processing and handling, much improvement is still needed in some parts of the world if