

FOOD SAFETY AND HYGIENE STANDARDS IN THE HOSPITALITY INDUSTRY

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ABSTRACT

Background: *With rapid technological changes in the field of food safety, we are moving away from traditional means of cooking and preservation to highly advanced mechanisms and procedures like Sous Vide, High Temperature Short Timing, Irradiation Techniques etc. These changes also bring growth of hospitality industries such as international and national tourism, restaurants, fast-food outlets and catering businesses.* **Objective:** *To gain knowledge about the preferences of the customers about food and its safety and secondly to examine the current status of Food and Hygiene standards in popular Quick Service Restaurants (QSRs).* **Methodology:** *The whole research has been conducted by surveying the opinions of 50 customers regarding their food habits, preferences, awareness about food safety laws. Fast food from popular fast food QSRs were tested for contamination.* **Results:** *The research revealed that while 53% of the respondents checked the hygiene of the outlet they ate in, yet 67% were unaware of the food safety laws in the country. The food samples had negligible contamination except for sample A that had 15 CFU/10ml.* **Conclusion:** *The research concluded that the consumers need to be made aware and they also need to have some technical information related to the said subject.*

Key Words: *Food Safety, Hygiene, HACCP, Fast Food, Contamination, FSSAI*

INTRODUCTION

Food is an essential part of life, but if it is contaminated it can cause illness even death, and food can be contaminated with toxic substances from outside or even it is already in the food itself. There are possibilities of contamination with microbiological, chemical and/or physical hazards with or without the growth of micro-organisms in each step of food preparations. There could be some confusion due to a range of terms known in the literature as food poisoning, food borne illness and food borne disease. Some of the foods are naturally poisonous, but some other may go through a prolonged and increasingly process from farm or producer to the point of consumption.

Smed and Jensen (2005) had studied the needs of food safety information and food demand. In their study they examined the effect of negative press coverage of Salmonella in shell eggs on the demand for pasteurised eggs. The results showed that negative safety news about one product can provide a significant stimulation on the demand for other products. Therefore, food safety awareness of consumers will influence the demand of the products. Food safety nowadays has become a very important issue to be discussed and also become a considerable and increasing interest in many sectors including hospitality industry, food and beverage industry, government officials and public health institutions.

In India the Food Safety and Standards Authority of India (FSSAI) is the apex food regulator. It is empowered by and functions under the Ministry of Health and Family Welfare, Government of India. The FSSAI implements and enforces food regulations as prescribed in the Food Safety and Standards Act, 2006 (FSS Act). The FSS Act is an Act of Parliament, popularly known as the Food Act. Previous to the FSS Act there were a number of food legislations. All these have been consolidated into a homogenous whole in the FSS Act. The regulations of the FSS Act became effective in 2011 with FSSAI as its regulatory body. Though the Act continues to evolve it needs to be further harmonized with standards of international agencies for global parity (Arora, 2015).

Food technology development in the last decades brings both market opportunities and food safety perils. Therefore food safety has become major interest in many sectors including hospitality industry, food processing industry, government institutes and public health agencies. Those involve in food preparation and service play a vital role in the prevention of food borne illness and/or food borne disease and their actions can be critical in preventing outbreaks of food borne illness and/or food borne disease. Hence preventing the outbreaks is more a matter of understanding where food borne disease originates and how food manufacturing and storage can increase the risks of that disease. This understanding should belong not only to the food handlers but also the managers of industries related to food as well as the consumers.

The following works from various researches and journals have been taken into account while preparing a foundation for this research:-

Cartwright (2003), in a study on Food and waterborne infections associated with package holidays found that Package holiday tourism is a growing industry with over 20 million holidays sold every year in the UK. Destinations are in every continent including country with poorly developed, as well as those with an advanced, public health infrastructure. The incidence of gastrointestinal infection is not reflected in official surveillance programmes as they largely fail to capture information on travel associated infections. Outbreaks of food and waterborne infections in these resorts are largely not investigated. Major British tour operators have responded by developing a crude but effective continuous surveillance system for subjective travellers' diarrhoea. The importance of food and water hygiene is, however, not ignored and proactive preventative programmes are being developed and implemented in some resort as well as by the tourist industry and international agencies.

Yeung and Morris, 2001 in a study on Food safety risk—Consumer perception and purchase behaviour. The study identified Food safety has become a major issue of public concern, encouraging the UK Government and the food industry to take steps to rebuild consumer confidence. In this context, the paper draws on a review of research literature to develop a conceptual framework to identify and review the factors influencing consumer perception of food safety related risks and the likely impact on purchasing behaviour. The relevance of strategies adopted by consumers to reduce risk exposure and the influence on the likelihood of food purchase are also explored, together with the implication for the food industry.

Rhodehamel, 2013 in a study on Overview of Biological, Chemical, and Physical Hazards suggested HACCP as a systematic approach to be used in food production as a means to ensure food safety. The first step requires a hazard analysis, an assessment of risks associated with all aspects of food production from growing to consumption. However, before one can assess the risks, a working knowledge of potential hazards must be obtained. A hazard is defined by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) as any biological, chemical, or physical property that may cause an unacceptable consumer health risk. Thus, by definition one must be concerned with three classes of hazards; biological, chemical, and physical.

Food safety- Consumer concerns- The research outlines the findings of a simple piece of research into consumers' greatest concerns over food. Using the Scottish Consumer Council's Consumer Network as a sample, each was asked to complete a questionnaire asking about the three issues which gave them greatest concern. Food hygiene standards, GM foods, and the use of chemicals, pesticides and additives came out very strongly. Other issues are also listed. Overall there was an

overwhelming feeling by consumers that they did not have all the information and knowledge and there was much confusion about the facts (Kidd, 2000).

Food safety in the 21st century- The global importance of food safety is not fully appreciated by many public health authorities despite a constant increase in the prevalence of foodborne illness. Numerous devastating outbreaks of salmonellosis, cholera, enterohaemorrhagic *Escherichia coli* infections, hepatitis A and other diseases have occurred in both industrialized and developing countries. In addition, many of the re-emerging or newly recognized pathogens are foodborne or have the potential of being transmitted by food and/or drinking water. More foodborne pathogens can be expected because of changing production methods, processes, practices and habits. During the early 21st century, foodborne diseases can be expected to increase, especially in developing countries, in part because of environmental and demographic changes. These vary from climatic changes, changes in microbial and other ecological systems, to decreasing freshwater supplies. However, an even greater challenge to food safety will come from changes resulting directly in degradation of sanitation and the immediate human environment. These include the increased age of human populations, unplanned urbanization and migration and mass production of food due to population growth and changed food habits. Mass tourism and the huge international trade in food and feed are causing food and feed borne pathogens to spread transnationally. As new toxic agents are identified and new toxic effects recognized, the health and trade consequences of toxic chemicals in food will also have global implications. Meeting the huge challenge of food safety in the 21st century will require the application of new methods to identify, monitor and assess foodborne hazards. Both traditional and new technologies for assuring food safety should be improved and fully exploited. This needs to be done through legislative measures where suitable, but with much greater reliance on voluntary compliance and education of consumers and professional food handlers. This will be an important task for the primary health care system aiming at “health for all” (Abdussalam and Kaferstein, 1999).

Steffen, 1999 in a study on Epidemiology, etiology and impact of travellers' diarrhoea in Jamaica Traveller's diarrhoea (TD) can incapacitate travellers. Characteristics of TD could be helpful in identifying individuals who might benefit from a vaccine against TD. The research determines epidemiology, etiology, and impact of TD in Jamaica. Design Two-armed, cross-sectional survey conducted between March 1996 and May 1997. The locations were Sangster International Airport and 10 hotels in Montego Bay area, Jamaica. The subjects were investigated upon epidemiology and impact, 30369 short-term visitors completed a questionnaire just before boarding their homebound aircrafts. To investigate etiology, 322 patients (hotel guests) with TD provided stool samples. The attack and incidence rates of reported diarrhoea and of classically defined TD (≥ 3 unformed stool samples in 24 hours and ≥ 1 accompanying symptom), incapacity, risk factors, and etiology.

The attack rate for diarrhoea was 23.6% overall, with 11.7% having classically defined TD. For a mean duration of stay of 4 to 7 days, the incidence rate was 20.9% (all TD) and 10.0% (classic TD). Among airport respondents, the incapacity lasted a mean of 11.6 hours. Less than 3% of all travellers avoided potentially high-risk food and beverages. The most frequently detected pathogens were entero-toxigenic *Escherichia coli*, *Rotavirus*, and *Salmonella* species.

Adam et al, 2007 in a review of food safety and food hygiene training studies in the commercial sector summarised the methods and results of studies conducted worldwide on the effectiveness of food safety and food hygiene training in the commercial sector of the food industry. In particular it focuses on those studies that have tried to evaluate the effectiveness of such training. Forty-six studies of food hygiene training are included which used some outcome measure to assess the effectiveness of training. The short-term nature and variety of measures used limited the majority of studies. The need for the development of evaluation criteria of effectiveness of food hygiene training is discussed.

The study was the survey on food hygiene and safety training in the retail and catering industry. Training provisions were evaluated against the guidance in the relevant industry guides. Additional information was collected on the managers' perceptions of and attitudes towards hygiene training. There was a similar lack of hygiene management systems in most of the catering businesses in this study but senior staff were better trained and were able to provide in house training to greater effect. All the businesses carried out on the job training, although in some this was restricted to induction training, the content of which was often ill defined. There was a lack of documented hygiene procedures, reinforcement strategies and very little refresher training activity. Many managers failed to provide feedback on performance, to test hygiene knowledge or praise good hygienic performance. Half of the managers were not trained to train, and often were untrained in elementary hygiene themselves. Some managers recognised that conditions in the workplace and time pressures could contribute to poor hygiene performances (Griffith and Worsfold,2003).

Corigliano and Hjalager, 2000 in a study on Food for tourists- determinants of an image- this research talks about the combination of food and tourism with respect to Italy and Denmark. It was found that both the countries represent a culture of food deeply ingrained within the society. In Denmark, food production is a major economic activity, and the power of agro-industries along with food processing industries has in many cases compromised the quality of food being provided to tourists. Italy, on the other hand, focused on fresh choice of ingredients. So, the condition was found relatively better. This was due to the consumer pressure on maintaining fresh quality of food in the country. The research focused on the fact that due to increasing concentration of tourists at a place taxes a heavy toll on the resources leading to social issues of adulteration that affects the image of the destination.

Okello and Swinton, 2007 did a study on Compliance with International Food Safety Standards in Kenya's Green Bean Industry: Comparison of a Small- and a Large-scale Farm Producing for Export found European food safety standards have increased the fixed and transactions costs of Kenyan green bean farmers while requiring more stringent quality monitoring by exporting firms. This paired case study finds that large farms use owner equity to invest in improved facilities. Small farms attain scale economies by joining a marketing group that spreads facility investment costs and reduces the transaction cost to buyers of monitoring small farm performance. Green bean buyers meet the asymmetric information problem by close monitoring, the threat of contract termination, and variable product pricing to induce compliance with the standards.

Baroudi *et al*, 2010 study on Effect of a Manager Training and Certification Program on Food Safety and Hygiene in Food Service Operations found that Food safety is an important public health issue in the U.S. Eating at restaurants and other food service facilities increasingly has been associated with food borne disease outbreaks. Food safety training and certification of food managers has been used as a method for reducing food safety violations at food service facilities. However, the literature is inconclusive about the effectiveness of such training programs for improving food safety and protecting consumer health. The purpose of this study was to examine the effect of food manager training on reducing food safety violations. Restaurants with trained and certified food managers had significantly fewer critical food safety violations but more non-critical violations than restaurants without certified personnel. Institutional food service facilities had significantly fewer violations than restaurants, and the number of violations did not differ as a function of certification. Similarly, restaurants with many outlets had significantly fewer violations than restaurants with fewer outlets, and training was not associated with lower numbers of violations from restaurants with many outlets. The value of having certified personnel was only observed in independent restaurants and those with few branches. This information may be useful in indicating where food safety problems are most likely to occur

Clayton *et al*, 2002 in a study on Food handlers' beliefs and self-reported practices found that despite an increase in the number of food handlers receiving food hygiene training, a high proportion of food poisoning outbreaks still occur as a result of poor food handling practices. This paper uses elements of social cognitive theory to examine the beliefs of food handlers towards food safety and to determine food handlers' self-reported practices. Questionnaires were completed by 137 food handlers from 52 small to medium-sized food businesses in Wales. Generally, food handlers were aware of the food safety actions they should be carrying out but identified a number of barriers which would prevent them from implementing these practices. These barriers included lack of time, lack of staff and a lack of resources. Despite 95% of respondents receiving food hygiene training, 63% admitted to sometimes not carrying out food safety behaviours. All the food handlers

also perceived their business to be of relatively low risk and yet all businesses prepared high risk foods. This research highlights the need for training to be based around a risk-based approach and demonstrates that behavioural change will not occur merely as a result of training. Food safety practices will only be implemented given adequate resources and an appropriate management culture.

Trienekens and Zuurbier, 2008 did a study on Quality and safety standards in the food industry, developments and challenges. The study identified consumer concerns related to food safety scandals and globalization of food production have resulted in a global and interconnected system for the production and distribution of food. In the last decade many public and private standards on food safety and quality have been developed as a result of these developments. Currently, there is proliferation of standards worldwide. One effect is that, in particular, companies from developing countries and emerging economies have problems to comply with these standards. Another important effect is increasing marginal costs of certification and accreditation, which also puts pressure on company profits in industrialized countries. The combined impacts of these effects ask for strategies to revalue the cost/effectiveness of the certification and accreditation system.

The study on the management of food safety—the role of food hygiene training in the UK service sector—reviews the literature pertaining to the role of food hygiene training in a strategy to manage food safety. Traditional assumptions that the provision of knowledge alone will lead to changes in attitudes and thus performance has been shown to be ill founded. A multitude of factors relating to the course itself, and events pre- and post-training have been shown to mitigate the effectiveness of training in bringing about desired changes in behaviour. Effective and relevant food hygiene training delivered with the support of the organisation, adequate resources and the peer support of colleagues will have a greater effect on intention and actual behaviour of the food handler, increasing the likelihood that safe working practices are carried out at all times. Such approaches are necessary if hygiene training is to have an impact on food safety management (Eves and Seaman, 2006).

In the study on evaluation of worldwide approaches to the use of HACCP to control food safety identified Hazard Analysis by Critical Control Point (HACCP) is a management tool, developed in the late 1960s, to ensure the safety of foods for space flights. It was subsequently recognised as an effective alternative to conventional end-point-testing by the World Health Organisation (WHO) and the United States Food and Agriculture Organisation (FAO), amongst others, and recommended for use in commercial food production. HACCP principles are now incorporated in national food safety legislation of many countries, as well as a likely future component of the standardisation of international food quality control and assurance practices. However, governments and food companies have interpreted HACCP differently. The paper describes the basic principles

of HACCP, and evaluates its implementation in the European Union, North America, Australia and New Zealand, and in developing countries. The 'Zurich House of Food-Safety' approach was identified as the most rigorous (and possibly most effective) interpretation of HACCP, while the Australian food industry approach was identified as the most practical and readily applicable approach to HACCP (Beck and Ropkins, 2000).

Jensen and Unnevehr, 1999 in the study on the economic implications of using HACCP as a food safety regulatory standard found that nature and role of Hazard Analysis Critical Control Point (HACCP) as a food safety control system and, in particular, its role as an element of public food safety regulation. The notion of efficiency in food safety regulation is discussed and related to the nature of food safety controls. It is suggested that, if appropriately applied, HACCP is a more economically efficient approach to food safety regulation than command and control (CAC) interventions. The economic implications of HACCP are discussed with reference to estimates of the costs and benefits, in particular for the food industry. Finally, the use of HACCP as an international trade standard and the facilitation of trade in processed food products are considered.

Athukorala and Jayasuria, 2003 in a study on Food Safety Issues, Trade and WTO Rules: A Developing Country Perspective found that the SPS Agreement and the related WTO dispute settlement mechanism are an important first step in strengthening the global trade architecture, bringing in greater transparency and orderly conditions to world food trade. However, implementation of the new trade rules has turned out to be a more complex task than the traditional market access issues handled by the WTO. Several factors, including inadequate financial and technical resources, have constrained developing countries from becoming effective participants in the implementation process, and there is widespread suspicion that SPS regulations are being used as hidden protectionist devices by developed countries. However, despite all the problems, some developing countries have been quite successful in penetrating developed country food markets; they have done so by accepting the consumer preferences and standards in quality-sensitive high-income markets and implementing domestic supply-side measures.

The occurrence of indicator bacteria on hands and aprons of food handlers in the delicatessen sections of a retail group- In this study, samples were collected from the hands and aprons of food handlers in the delicatessen sections of a prominent South African retail group and analysed for the presence of total viable counts (TVC), total coliforms, *Escherichia coli*, members of the family Enterobacteriaceae and *Staphylococcus aureus* in order to assess the levels of contamination and to establish possible relationships. Noteworthy TVC were present on 98% of hands and 84% of aprons sampled and conformed to the national standard of 1×10^2 cfu cm⁻² without exception. Coliforms were present on 40% of food handler's hands and on 26% of aprons and when compared to the literature which suggests a target value of <2.5 cfu cm⁻², 32% of food handlers exceeded

the target with regard to hands and 8% with regard to aprons. *E. coli* was found to only exceed the limit in the case of one food handler. Enterobacteriaceae were present on the hands of food handlers (44%) and on aprons (16%), ranging between 5 and 1.8×10^1 cfu cm⁻² on hands and between 5 and 2.9×10^1 cfu cm⁻² on aprons. *S. aureus* counts were present on 88% of hands and 48% of aprons and ranged between negligible and 9.8×10^1 cfu cm⁻² for hands and up to 6.2×10^1 cfu cm⁻² for aprons. No significant statistical correlation occurred between the organisms on hands and aprons, indicating that the latter were not likely to be cross-contaminated by hands (Lues and Tonder, 2007).

After learning the national and the international scenario of Food Safety, the current study on Food Safety and Hygiene Standards in the Hospitality Industry was conducted. The objectives undertaken were:

- To gain knowledge about the preferences of the customers about food and its safety.
- To examine the current status of Food and Hygiene standards in popular Quick Service Restaurants (QSRs).

METHODOLOGY

A descriptive study design was used to conduct the survey as a part of the research. The design involved the use of a detailed questionnaire. The respondents were asked to fill in their experiences of QSRs. The various responses were recorded and were analysed on the basis of various parameters.

Secondly, five food outlets were taken into consideration and food samples were collected. They were analysed for contamination colonies of bacterial strains and the results were compared with the standards established by FSSAI.

The responses were collected randomly by approaching respondents from QSR outlet Kashmere Gate, Government Girls Senior Secondary School, Nithari, Delhi and Punjab National Bank, Tis Hazari Branch. Prior permission was taken from the respective authorities. The respondents expected to answer were from the age group of 15-35 years. The research also included five QSRs food establishments across Delhi. The food products were analysed in the Microbiology Laboratory of IHM, Pusa.

The sample size was 50 consumers from the age group of 15-35 years and five QSRs food establishments from New Delhi.

Tools and Techniques: The tools adopted for the research were Quantitative and Observational techniques.

The respondents were asked to fill out a detailed questionnaire that contained the questions for the said topic. The data was collected on characteristics, demographics, preferences, knowledge and attitude. Food and hand samples from 5 establishments were collected and analysed for contamination in laboratory of IHM, Pusa. The results were compared with FSSAI standards and tabulated.

The respondents were approached, rapport was developed and information was collected through questionnaire. This was done prior to the Quantitative Assessment so as to develop a proper baseline for the said research.

RESULTS AND DISCUSSION

The questionnaire was posed to 50 customers. The respondents revealed their eating habits and their awareness about the food safety and hygiene standards. The questions were posed in an order so as to detect the theoretical knowledge as well as its practical implications. After conducting the survey among the respondents, the data was processed and the results were obtained. These results provided a detailed insight into the consumer's preferences regarding food and their viewpoint on hygiene practices being adopted by their preferred outlets. The results also helped in segregating the consumers by age groups, profession and working hours and Awareness Levels.

Table 1: Demographic details of the sample population

S.No	Detail	Demographics
1.	Age Groups	15-20 Years = 20% 20- 25 Years = 33% 25-30 Years = 37% 30 and Above Years = 24%
2.	Profession	Student = 25% Housewife = 2% Private Sector = 10% Government Sector = 20% Self Employed = 12% Others = 31%
3.	Food Preference	Vegetarian = 67% Non Vegetarian = 33%

S.No	Detail	Demographics
4.	Frequency of Monthly Consumption of Outdoor Food	1-2 Times = 59% 03 Times = 14% 4-6 Times = 10% Others = 17%
5.	Choosing Particular Outlet	Junk = 39% Healthy = 24% To change the taste = 37%

The above table shows the respondents age group ranged from 15 years to 30 years and above. Most of the respondents were concentrated in the age groups of 25-30 years (37%) followed by 20-25 years (33%), 30 years and above (24%), 15-20 years (6%). The sample population in the study were maximum young office goers. Most of the respondent's profession belonged to various categories like business and consultancy (31%) followed by students (25%), government sector employees (20%), self-employed (12%), private sector (10%) and the least as housewives (2%). The research revealed that over 67% of the respondents were primarily vegetarian and the rest that is 33% were non-vegetarian. Samples being Indian, vegetarianism was more observed. Regarding the frequency of how many times in a month did they eat from outdoor establishments (QSRs) it was found that 59% responded to consume food 1-2 times a month, 17% said that they did not consume such food or more than the options provided, 14% reported 3 times and 10% reported 4-6 times in a month. The result revealed that majority of the consumers were aware of the associated risks with junk food and many of them are also aware of the compromises being made with the hygiene practices still wants to have food outside home. The results also revealed that most of the sample population prefers junk foods (39%) and like to change the routine taste (37%) as they are conveniently available through mobile applications.

The 90% respondents were aware of the indicators of food hygiene at their preferred food outlet like general appearance of the outlet, grooming standards of serving staff, Hygiene certificates, clean cutlery, no site of pests etc. This result gave a clear idea as to how aware are the respondents about the levels of hygiene and what priority do they give to the cleanliness levels. As stated by Abdussalam and Kaferstein (1999) on Food safety in the 21st century that there will be less food borne outbreaks as majority population pays attention to about 5 factors that signify cleanliness.

The study enquired about their major issue while eating food at their preferred outlets, it was found that 80% preferred because of taste, quantity and quality of service. 20% were concerned with Food Additives, hidden fat and salt content. This means that food outlets have to take into consideration the total quality at most.

Only 14% of the respondents were aware of the FSSAI Food regulatory Authority, which is a very low percentage of the population. This results highlights to enhance awareness programs to propagate FSSAI role in Catering establishments.

Madhvapathy and Dasgupta, 2015 in a study on Lifestyle trends on changing food habits of Indian consumers with an objective to identify these key lifestyle trends that have emerged over the dozen years or so and understand the way they are changing food habits also supports the current study results. They conducted the study on 600 respondents across 6 cities in India. The results showed that there is a shift from opting to eat at home to opting to eat out. The subjects were aware about the harmful effects of processed foods but the reason for consumption was attributed primarily to ease of purchase.

For analysis of second objective, the food samples collected from 5 identified food outlets were analysed as per the techniques developed by FSSAI and the results were as follows:-

Table 2: Observations from the analysed food samples

SAMPLE ID	SOURCE	CFU/ 10mL	REMARKS
1	Sample A	15	Negligible contamination
2	Sample B	5	Negligible contamination
3	Sample C	0	No contamination
4	Sample D	0	No contamination
5	Sample E	0	No contamination

**CFU- Colony Forming Units*

The results were tabulated after the laboratory assessment of the food samples was done in a sterile environment. The results represent the quantitative data of the assessment. The results revealed the number of CFU/ 10mL (Colony Forming Units). It is an indicator of the amount of contamination present in the food sample. CFU is the number of microbial colonies present in the sample, which, if given optimum conditions to thrive can spoil or change the texture of the food sample.

The food samples from sample A and sample B had 15 and 5 CFU/10mL, respectively. This is an indicator of contamination but, the levels are considered to be negligible by the FSSAI. Thus, the results are acceptable. For the rest of the samples there was no growth of microbial colonies on the nutrient media and hence no contamination was found in the samples.

The above results also reveal that the hygiene practices adopted by the selected Quick Service Restaurants (QSRs) are in accordance with the rules and regulations adopted by the FSSAI. It is also an indicator of their awareness about the importance of safety of food products and the harmful effects, if any.

It can further be suggested that 2 of the food establishments, where contamination was found need to monitor their food safety standards so that the food samples do not show even minor contamination. Also, the Government should try to include HACCP as a measure of food safety as it a very cost effective method. The consumers need to be made aware of the food safety laws and the basic techniques that make their food safe for consumption.

Antimicrobial resistance (AMR) is becoming a serious global problem. It is estimated that it might lead to 10 million deaths per year and loss of outputs worth US \$100 trillion by 2050. Antibiotic misuse in food-animal production is one of the key causes of AMR. This study examines select fast food restaurants in India to draw a comparison between their Indian and global (particularly US) positions to contain or end antibiotic presence in the meat they use. While these chains have committed to stringent regulation in the US and international markets, their Indian commitments leave a vague aftertaste. Extending their international standards to India will not only pre-empt government intervention but will also certainly help with sales as an informed consumer base seeks healthier and more wholesome quick bites. (Bhushan et al, 2017). The study clearly supports the current study that any of the 3 hazards makes the food unsafe for consumption.

It can, hence, be concluded from this research that the Food Safety and Hygiene practices adopted by the selected Quick Service Restaurants are satisfactory and the levels of contamination were found to be in limits.

CONCLUSION

It can thus be concluded from this research that there is a dire need to spread awareness about Food safety. The consumers need to be made aware and they also need to have some technical information related to the said subject. The food establishments on other hand should try to imbibe more stringent means of controlling hygiene and adopt the new practices that are widely followed worldwide, viz, HACCP. The food industries need to understand the need of the recent times and also calls for shedding of out-dated techniques to measure food quality. Today, the Indian food industry needs to analyse contamination from the source in food products rather than just focussing on what is present practice. The research is beneficial to the society in the sense that it provides an insight into quantitative results obtained by analysing the food samples and also by suggesting outlets from where safe food can be procured. Mass programs to create awareness of FSSAI policies should be drafted so that our countrymen receives safe food and we develop a healthy population which will help improving the economy of the country. Also FSSAI guidelines need to strengthen to ensure that customer awareness increase and food companies opt for a more transparent communication platform. Thus the implications of the research were an attempt to

ensure that key steps to be taken by public officials: such as a tax on unhealthy foods, subsidies for healthy food, and promotion of healthy norms.

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