

**Review Article****EFFECTS OF FOOD ADULTERATION ON HUMAN HEALTH: A PROPOSED SURVEY OF HIGHER EDUCATION INSTITUTIONS OF DERA ISMAIL KHAN, KHYBER PAKHTUNKHWA, PAKISTAN****Muhammad Siddique^{1*} | Malik Muhammad Hashim² | Afia Saadat³**

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ABSTRACT:

Background: Food adulteration is the process in which the quality of food is lowered either by the addition of inferior quality material or by extraction of valuable ingredient. This study is centered to the food adulteration, particularly in the dairy products.

Objective: The main objective of the study is to assess the perception of respondents regarding the Food Adulteration and its effects on human health.

Material and Methods: This study will be based on exploratory and descriptive research design, wherein both secondary and the primary data will be used. The secondary data will be collected from the existing literature, whereas the primary data will be collected from 365 respondents (estimated from pilot study) from higher education institutions of Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, by using the convenience sampling technique. Moreover, the researcher has developed an adapted questionnaire for the collection of primary data.

Results: This data will be analyzed by using the descriptive and inferential statistical tools. Similarly, the conclusion will be drawn from the findings of the study and will be compared with the results of previous studies for positioning and finding the results-gaps, if any. Last, but not the least, the researcher will give recommendations which may be helpful in understanding and resolution of the issue in question.

KEYWORDS:

Food Adulteration, Potential Risks, Control of Adulteration, Government Regulations

1 | INTRODUCTION

Pakistan is the fifth largest Republic of the World with estimated population of 250 million people. It is known as a less developing country in terms of per capita income, health facilities, literacy rate, and infrastructure development as compared to the advanced countries of the World. Public Health remained an issue throughout the inception of Pakistan¹. Health is multi-dimensional in nature. It includes physical, mental, emotional, spiritual, social, economic and environmental health. Human life often stays at the verge of collapse in most parts of the World WHO². In this regard, the developed countries often maintain good health of their masses by providing them quality food and better health facilities, however, the developing nations often struggle while coping with the issues of food adulteration, impure/sub-standard food processes, causing human illnesses at large and spending country's resources in the cure of such diseases³. This study is an attempt to know the perception of people about Food Adulteration and its effects on Human Health, by taking into account the Higher Education Institution of Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan.

2 | LITERATURE REVIEW

2.1 | FOOD ADULTERATION

Food Adulteration refers to the intentional or unintentional addition of any substance to the food which reduces its quality, natural value, and/or purity. This can occur at any stage of the food production process, from the growing of crops to the packaging of finished products⁴. Food adulteration reduces the quality, purity or safety of food for the consumers. This practice is illegal and can have serious consequences on human health, such as food poisoning, allergic reactions, chronic illnesses, and in severe cases, death⁵. The effects of food adulteration on human health can range from mild to severe and can even be life-threatening. Food adulteration is done in order to deceive consumers or make the food appear of higher quality than it actually is. This practice can have serious effects on human health, including malnutrition, food poisoning, and long term health problems³.

2.2 | FORMS OF FOOD ADULTERATION

Some common examples of harmful substances that are added to food include chemicals, such as pesticides and artificial coloring, toxins like lead and mercury, artificial sweeteners, harmful chemicals, bacteria, toxic chemicals, heavy metals and unapproved food additives may alter the quality and purity of food thereby causing it harmful for the human health. Some other food adulterants include chemicals, such as melamine in dairy products, and contaminants, such as bacteria in meat products and preservatives can also contribute to food adulteration⁶. Similarly, adding water to milk to increase its volume, using cheaper ingredients to replace more expensive ones and adding harmful chemicals to food to extend shelf life or improve its appearance are some of the foul practices of producers/sellers, detrimental to human health⁷. It is important to be aware of these practices and take steps to ensure that the food we consume is safe and free from harmful contaminants. This include purchasing food from reputable sources, checking food labels, and reporting any suspected instance of food adulteration to the appropriate authorities³.

2.3 | POTENTIAL RISKS OF FOOD ADULTERATION

It is important for consumers to be aware of the potential risks of food adulteration and to take steps to protect themselves, such as acquisition of food from the trusted outlets. Ingesting artificial sweeteners or preservatives can cause immediate health problems such as digestive discomfort and headaches, allergic reactions and long term problems such as cancer and organs damage⁷⁻⁸. Consuming adulterated food can lead to food poisoning, which can cause symptoms such as nausea, vomiting, diarrhea, and abdominal pain. In severe cases, it can even result in hospitalization or death. Similarly, ingesting these contaminants can lead to various health problems such as digestive disorders, food poisoning, chronic illnesses, birth defects, and even death in severe cases. In addition, long-term consumption of adulterated food can lead to the accumulation of toxic substances in the body, leading to more serious health problems⁹.

2.4 | CONTROL OF FOOD ADULTERATION

Government and regulatory agencies also play a crucial role in preventing food adulteration by setting and enforcing standards for food production and labeling. To protect against adulterated food, it is important to be informed about food labeling and food safety regulations, to purchase food from reputable sources, and to be aware of any warning signs of adulteration such as unusual color, smell or taste⁹. To prevent the effects of food adulteration on human health, it is important to follow good food safety practices, such as proper food storage and handling, and to choose food from reputable sources. Regular monitoring and testing of food products by the government agencies and food producers also help to reduce the risk of food adulteration¹⁰.

2.5 | CONCEPTUAL FRAMEWORK

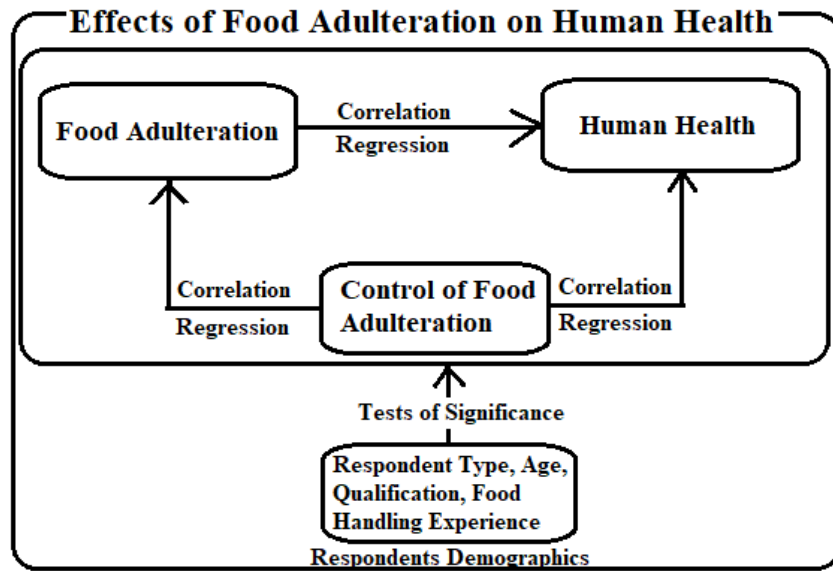


Figure 1 Conceptual Framework

The conceptual model consists of three research variables and four demographic variables. The researcher will use the survey approach because the surveys are considered very useful and handy especially when the population is quite large, scattered and diverse in nature. The population of this study will be Teachers and Students of Higher Education Institutions of Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan. In this study, the researcher has ascertained the sample size of 265 by using the statistics of a pilot study (70 respondents), prior to the main research. Similarly, for secondary data collection the researcher has conducted the survey of available literature. Moreover, in order to foster the finding of other researchers the researcher will conduct the field survey by using an adaptive questionnaire (based on measurement scale 1-5). Last but not the least, the researcher will use both descriptive and inferential statistical tool for the analysis of primary data.

3 | DISCUSSIONS

‘Food Adulteration’ is a process of mixing of a non-food item with the aim to increase the quantity of food and/or its quality thereby resulting in loss of actual food quality. It may be the mixing of impure, cheaper, sub-standard and toxic matters to the food stuff which possibly affect its quality. Food adulteration may be intentional or unintentional. The intentional adulteration may include mixing of small quantities of substances to improve its color, texture, appearance, taste, flavor and storage properties¹. For example, turmeric and saffron are used as coloring agent; vanilla essence is used as flavoring agent; saccharin is used as flavoring agent; and sodium benzoate is used as preservatives. These food additives are meant for human consumption, but their excessive use may risk the human health. Mostly, the processed food such as sweets, cakes, biscuits, breads, jams, ice creams, soft drinks and refined oil contain such food additives. Similarly, the unintentional food contamination happens accidentally/incidentally. For example, farm products may be contaminated by the use of fertilizers, insecticides and pesticides³.

4 | CONCLUSIONS

Food adulteration reduces the quality, purity or safety of food for the consumers. This can happen at any stage of the food production chain and can have serious effects on human health. This practice is illegal and can have serious consequences on human health, such as food poisoning, allergic reactions, chronic illnesses, and in severe cases, death. The effects of food adulteration on human health can range from mild to severe and can even be life-threatening. Food adulteration is done in order to deceive consumers or make the food appear of higher quality than it actually is. This practice can have serious effects on human health, including malnutrition, food poisoning, and long term health problems such as cancer, organ damage and even death.

It is important to be aware of these practices and take steps to ensure the food we consume is safe and free from harmful contaminants. This include purchasing food from reputable sources, checking food labels, and reporting any suspected instance of food adulteration to the appropriate authorities. Additionally, governments and organizations can ensure safe and hygienic food supply by implementing regulations, conducting regular inspections of food facilities and by installing monitoring systems to detect and prevent food adulteration. Similarly, to protect themselves, consumers should be cautious of food that appears to be of suspicious quality or origin, and always purchase food from reputable sources. They should also follow good food safety practices, such as washing fruits and vegetables thoroughly and cooking meat to appropriate temperatures.

CONFLICT OF INTEREST

All authors declare no conflict of interest

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