

The Danger of Heat-Resistant Microbes to Humans

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Abstract

This study aims to what are heat-resistant bacteria, and what is their danger to humans? What are the types of heat-resistant bacteria? A questionnaire was prepared via Google Drive and distributed to the population aged 25-55 years, men and women, in the city of Mecca. As for the questionnaire, it was distributed via the social networking program (WhatsApp) for the purpose of distancing for fear of the presence of the Corona virus, 390 questionnaires were distributed, and 380 responses were obtained via email to the principal researcher. It concluded that Bacteria that love high temperatures and high acidity are ancient bacteria that thrive in highly acidic environments full of sulfur? 66.7% the danger of this bacteria to humans and their health.

Keywords: bacteria, human.

1. Introduction

Heat-resistant moulds (HRMs) are the spoilage factors of thermally processed products such as pasteurised items and fruit products, which may cause financial losses and harm to food quality. the heat resistance of these moulds depends on their ability to produce heat-resistant structures such as ascospores, which are similar to bacterial spores. These moulds can endure heat procedures of food with their ascospores and are regularly found to be related to fresh fruits. Moreover, they may pose a health risk due to their metabolites and mycotoxins (1; 2; 3). These types of moulds are broadly dispersed in vineyards, plantations and areas in which fruits are grown, where they can live for quite a while and can therefore contaminate raw substances coming in touch with the soil. Once the foods are contaminated, it is difficult to inactivate the ascospores of HRMs. Thus, when contamination occurs, an obvious development of mycelium

will be seen, and if mould spores are found at high concentrations, it is a terrific financial loss for industries (4). HRMs are characterized by the generation of ascospores or comparable structures with heat resistance. This allows them to endure the thermal processes. Germination of ascospores may cause visible growth of mycelia on fruits (5). Ascospores produced by HRMs grow after some time of non-active development that can be broken with a sublethal heat treatment that will allow their germination and development under ideal conditions. This procedure is known as heat activation (6). After activation and if the conditions are approved, the ascospores can germinate and develop, causing food deterioration during storage at proper temperatures (7). Heat activation is required to begin the spore germination cycle and, in this way, it can also be an element in the development and recovery of HRMs (8). HRMs are additionally ready to create a few mycotoxin that pose a hazard to human wellbeing (6). The occurrences of HRMs are generally in fruit products, and their capacity to resist sanitisation and pasteurisation

2. Material and Methods:

The study began in (the city of Mecca in the Kingdom of Saudi Arabia), and the study ended with writing the data collection in September 2024. The researcher used descriptive analysis, an approach that uses quantitative or qualitative description of the social phenomenon (the danger of heat-resistant microbes to humans). The independent variable (the incidence of heat-resistant bacteria worldwide) and the dependent variable (the incidence of local heat-resistant bacteria). This type of study is characterized by analysis, reason, objectivity, and reality. It is also concerned with individuals and societies, as it studies the variables and their impact on the health of the individual, society, and the consumer, and the spread of diseases and their relationship. For demographic variables such as age, gender, nationality, and marital status. Status and occupation (9), and use the Excel 2010 Office suite pie chart to sort the results (10). The questionnaire is a wonderful and useful tool for collecting a huge amount of data, but the researchers were not able to conduct personal interviews with the participants in the online survey, due to social distancing rules at the time to prevent infection between participants and researchers and vice versa (Coronavirus sharing has not completely disappeared. of the community), and the questionnaire was only answered electronically, because the questionnaire consists of fifteen questions, all of which are closed-ended.

3. Results and discussion:

The percentage of approval to participate in the questionnaire (the danger of heat-resistant bacteria to humans) was 100%, and the percentage of ages of participants in the questionnaire was equal, from 25-55 years, with a ratio of 33.3 for each of them, and the gender percentage of male participants was 66.7% while females were 33.3%.The nationality of the male and female participants was 100% Saudi, and the majority of them, i.e. male and female participants in the questionnaire, were 100% Saudi. As for their responses to the questionnaire questions, they were as follows: The first question: Antimicrobial resistance poses a threat to food security if it is no

longer possible to treat livestock, which leads to Harm to humans? Yes 33.3% and I don't know 66.7%. Question 2: Bacteria cause bacterial infections while viruses cause viral infections? Yes 100%. Question Three: Can microbes live in space and survive cosmic and ultraviolet rays and extreme temperature fluctuations for an entire year? Yes 33.3% and I don't know 66.7%. Question 4: Are extremophile bacteria that grow and thrive in the harshest conditions, promising huge potential in many biotechnology areas? It was the same response as before. Question five: One of the applications of these bacteria is that they provide a safe, highly efficient way to clean up oil pollution? I don't know 100%. Question Six: Bacteria that love high temperatures and high acidity are ancient bacteria that thrive in highly acidic environments full of sulfur? Yes 66.7% and I don't know 33.3%. Question Seven: The climate crisis affects ecosystems related to human health and may lead to the spread of diseases? The answer this time was the opposite: yes, 33.3%, and I don't know, 66.7%. Question 8: The climate crisis and antimicrobial resistance represent the ability of microbes to resist drugs designed to suppress or kill them. These are two of the most serious and complex threats that the world is currently facing? The same response as in the previous question. The ninth question: Does climate affect the spread of microbes by increasing or reducing their power to influence humans or resist them? Question 10: Natural disasters may also affect preventive medicine programs, including vaccination, which leads to an increase in preventable infectious diseases and an increase in the use of antimicrobials. Yes 66.7 % and I don't know 33.3%. Last question: Do floods affect the severity of the spread of diseases and microbes of various types on humans? Yes 66.7% and I don't know 33.3%. (table:no-1)

Table:no-1: The danger of heat-resistant microbes to humans according to partipanes

The danger of heat-resistant microbes to humans	Yes	No	I don't know
Bacteria that love high temperatures and high acidity are ancient bacteria that thrive in highly acidic environments full of sulfur?	66.7%	0%	33.3%
Can microbes live in space and survive cosmic and ultraviolet rays and extreme temperature fluctuations for an entire year?	33.3%	0%	66.7%

There is a study entitled (Heat-resistant molds: Assessment, prevention and their consequences for food safety and public health) in 2022(11), The occurrence of HRMs in food products and their capacity to overcome sanitisation and pasteurisation are still a great challenge for the food industry. Mycotoxins from those microorganisms make HRMs more important in terms of public health and cause acute and chronic illnesses in humans. Machines, air and staff practices can impact the contamination level. Prevention of spoilage can be done through the reduction and decontamination of HRMs. However, more researches are required to develop assessments of HRM contamination and elimination.

4. Conclusion:

Bacteria that love high temperatures and high acidity are ancient bacteria that thrive in highly acidic environments full of sulfur? 66.7%, can microbes live in space and survive cosmic and ultraviolet rays and extreme temperature fluctuations for an entire year? 33.3%. it concluded that the danger of this bacteria to humans and their health.

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