



# EFFECTS OF FOOD ON HUMAN EMOTIONS: AN OVERVIEW

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## ABSTRACT

*Food is indispensable for sustaining life as well as promoting the health and well-being of all living things. As a basic need for sustenance of life, food provides nourishment - the energy and nutrients needed by the body for various activities. A wide variety of food across different groups is consumed by humans. Food is an integral part of life, a comfort factor for some, a gastronomic delight for another, a culinary art for a few, a career pathway for others and so much more. It is a well-known and established fact that our emotions have the tendency to change according to the food we consume. Food and emotions are closely linked; it has the ability to evoke a range of emotions in our body. It is found that while certain edibles such as those high in fat, carbohydrates and sugar tend to result in negative emotions in some people, most people relate sweet food and food rich in sugar as evoking positive and happy emotions. This investigative study aims to explore these emotional reactions to different kinds of food to gain a better understanding of the interrelationship between the two.*

**KEYWORDS:** Food, Human Emotions, Food habits, Food choices, Emotional advertising

## RESEARCH OBJECTIVES

The primary objectives of this exploratory research study are enumerated below:

- To determine the effect food has on human emotions
- To obtain a broad idea of the relationship between food type and human emotions
- To analyse food habits affecting food choices
- To explore the impact of emotional advertising on food choices
- To gain insights from earlier research studies on the complex relationship between food and emotions

## INTRODUCTION

“The belly rules the mind”, is a rather apt Spanish proverb that highlights how food affects the mind in addition to satisfying hunger. A study of the relationship between food and emotions helps researchers to find out the causative factors for alterations in human behaviour. This continues to be an area of interest for researchers engaged in studying the impact of food on human behaviour. This relationship varies from person to person according to their emotional stability and routine activities. In the animal kingdom, animals appear calm and relaxed after eating their prey and satiating their hunger pangs. Hunger pangs can irritate an animal and this change in emotion drives the animal to look for food to satisfy itself. The relationship between food and emotion has important implications for public health, as emotional binge eating and unhealthy food

choices can contribute to the development of obesity, eating disorders and onset of other physical and mental health issues. Understanding the factors that shape emotional responses to food can help individuals consciously make healthier food choices, take charge of their eating behaviour, improve their eating habits, avoid harmful foods and develop a more mindful and positive relationship with food.

## REVIEW OF LITERATURE

The relationship between food and emotion has been studied from various perspectives, including psychology, neuroscience, and nutrition (Canetti, L., Bachar, E., & Berry, E. M., 2002). Several studies have examined the effects of nutrients on mood and emotional well-being. Essential nutrients like omega-3 fatty acids, found in fish and other seafood, are purported to have antidepressant effects (Polak, M. A. et al, 2015). Functional magnetic resonance imaging (fMRI) is a neuroimaging technique that is used for identifying the specific regions in the brain that are activated during food-related emotions. For example, the amygdala, a brain region that is involved in processing emotional information, has been shown to be activated during food cravings (Castro, D. C., & Berridge, K. C., 2014). Research has found that food is integrated with, is an important part of and is influenced by culture. People from different cultural backgrounds may have different emotional associations with certain foods. Food consumption, food choices and food habits tend to vary across cultures along with

emotional responses. Certain foods invoke positive or negative emotions depending on cultural beliefs, attitudes, values and practices as well as culinary traditions. Some cultural groups provide guidelines to be followed about certain food habits that keeps them included in the community (Eugene, 2020). Emotional advertising is an important promotional technique adopted by marketers and companies to attract new consumers, widen their customer base and promote their products by eliciting an emotional response from the consumer. The emotional reactions to intake of food can be divided into positive emotional appeals and negative emotional appeals. Although consumers may exhibit numerous negative emotions, marketers generally use four types of negative emotions in persuasive and emotionally appealing advertising to establish a connection with their audience: fear, guilt, sadness, and anger (Eugene, 2021).

### THEORETICAL FRAMEWORK

The theoretical framework for studying the relationship between food and emotions is based on the concept that food is not just a means to fulfil a physical need, a source of energy and nutrition, to maintain good health and to ease hunger pangs but also a powerful symbol of cultural influences and emotional connections. It is used to celebrate special occasions and many social relationships are often forged over a meal. In **Affective Neuroscience Theory**, emotions, including emotional responses to food, are generated by specific neural circuits in the brain. According to this theory, the brain's reward system includes the mesolimbic dopamine pathway, which is activated by the consumption of comfort food and other pleasurable experiences (Montag & Davis, 2018). In **Social Cognitive**

**Theory**, individuals learn to associate specific foods with particular emotions through socialization and personal experiences. These associations can be influenced by cultural norms, social context, and individual beliefs (Luszczynska, A., & Schwarzer, R, 2015). **Psychodynamic Theory** suggests that food can be used as an alternative to satisfy emotional needs that are not being met in other areas of life, and to cope with stressful events or difficult circumstances. For example, individuals can use comfort food as a coping mechanism against negative emotions like sadness, fear, anger, anxiety and stress. Food can soothe problems, serve as a distraction or be used to fill an emotional void (Deal, 2007).

### RESEARCH METHODOLOGY

This research study examining the interconnectedness of food and emotions is undertaken through laboratory experiments, neuroimaging studies, and cognitive psychology research. Laboratory experiments involve manipulating different aspects of food (e.g., taste, aroma, texture) and measuring changes in mood or brain activity. Neuroimaging studies aid in identifying brain regions that are activated during food-related emotions. Cognitive psychology research assists in investigating the cognitive processes (e.g., attention, memory) that underlie food-related emotions.

### DATA COLLECTION AND ANALYSIS

A public survey was conducted using Google forms and circulated amongst the selected study group to solicit unbiased responses to certain questions and obtain a wide range of data. The framed questions, collected responses and analysis of gathered data are shown below.

#### 1. Do you consider yourself to be a connoisseur of good food?

Table 1. Food aficionado chart

Options	No. of Respondents	Percentage
Yes	91	52.6
No	37	21.4
Maybe	45	26
<b>Total</b>	<b>173</b>	<b>100</b>

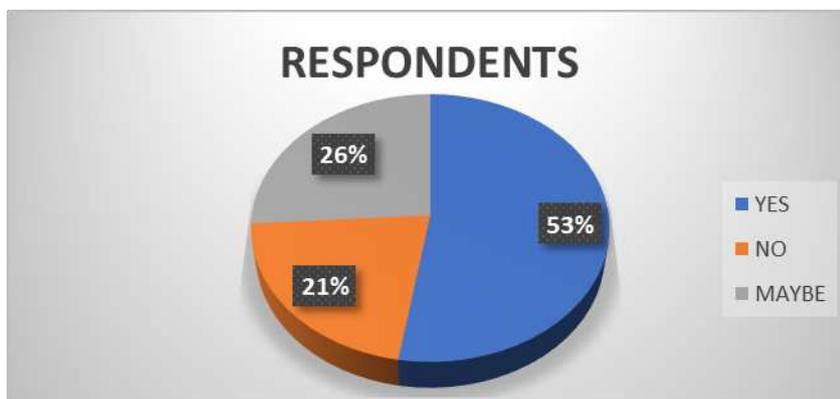


Fig.1 Interest in Food Chart

Most people are eager to expand their palate by trying new foods, tasting diverse dishes, incorporating unusual flavours, attempting fusion cooking and exploring different cuisines. Tried and tested recipes, on the other hand, have their importance for the finicky eaters. Writing food blogs and

posting restaurant reviews on social media along with enticing candid photos is a hobby in itself, dissecting aspects such as quality, quantity, ingredients, price, health quotient, value for money and ambience of the eatery. From the conducted survey, it is evident that more than half the respondents consider

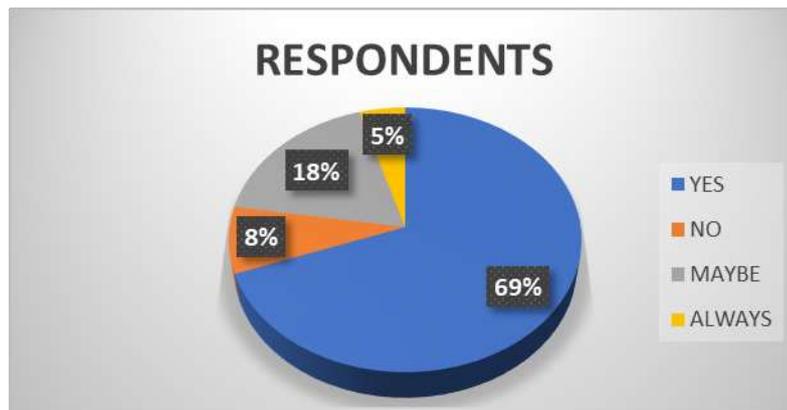
themselves to be very interested in food. And, many are rather keen on food, only not to the extent of the majority. However, a coin has two sides and so there are about 37 of those who

might not be that enamoured of food, looking at it functionally as mere sustenance.

**2. Do you believe that the food you consume affects your emotional state?**

**Table 2. Food affecting emotional state**

Options	No. of Respondents	Percentage
Yes	120	69.4
No	14	8.1
Maybe	31	17.9
Always	8	4.6
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.2 Food Affecting Emotional State**

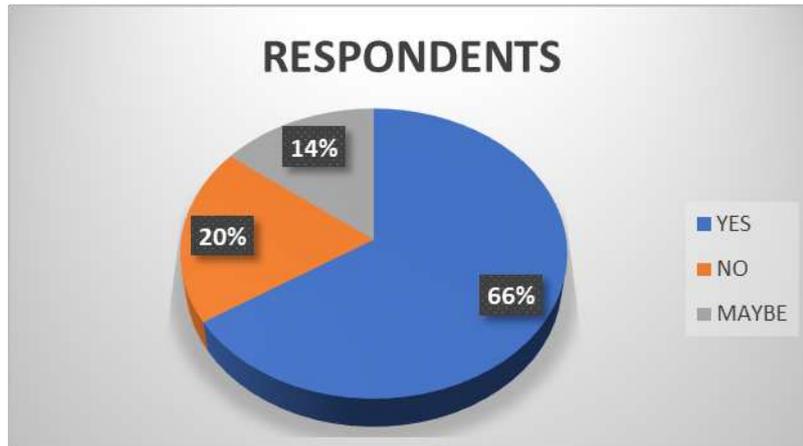
It maybe emphatically stated that food choices can bring about changes in moods, thinking, feelings, emotions or mental health. Bananas, for example, have been found to be a happy fruit as they have the essential amino acid called *Tryptophan*, which gets converted into the feel-good chemical called *Serotonin* in the body. This delicious fruit is packed with nutrients and is considered as a healthy and filling snack. It has proven benefits of being an energizer, keeping one relaxed and upbeat, improving one's mood and generally making a person feel happier. The obtained data reveals that almost 74% people

{69.4% + 4.6%} have felt an emotional change and behaviour modification after consuming food and can relate to it among which a few are absolutely sure about the interconnectedness of food intake and emotions. Some participants are unsure as to whether the consumed food does affect their emotions and feelings at times and are not too certain that it can be stated as a blanket statement for all the food consumed. A miniscule percentage of respondents believe that they have not experienced any sort of emotional change relating to the food they consumed.

**3. Do you often crave a specific food?**

**Table 3. Food cravings**

Options	No. of Respondents	Percentage
Yes	114	65.9
No	34	19.7
Maybe	25	14.5
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.3 Food longings of the respondents**

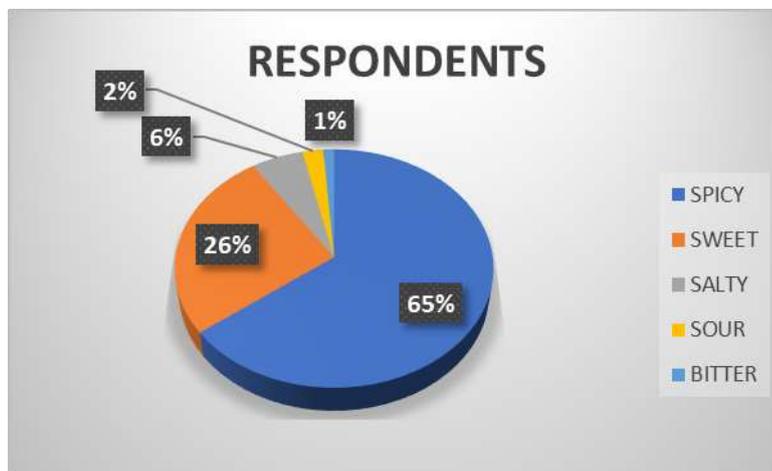
Food cravings that manifest as an intense need or longing for certain foods is very common among people of all age groups, it is quite often an uncontrollable urge to eat an energy-dense and unhealthy processed food, often with excessive amounts of salt, sugar, oil and fat. Upon analysing the data, it is clear that it corroborates the findings of other experimental studies which have analysed the psychology behind the phenomenon of food craving. Scientific studies have established that almost all men and women do experience food cravings, differences being only in the magnitude and specificity of the craving. As seen in the

above data, more than 65% emphatically state that they do experience intense cravings for specific food, often tantalizing sweet and salty junk foods, and a few among the ‘Maybe’ category too might feel likewise. Although food cravings are common, there are around 19% of people, a minority, who do not experience any sort of craving for food or may not have had any noticeable yearning for unhealthy sugary, salty or fatty foods as such.

**4. What type of food do you generally enjoy eating?**

**Table 4. Food preference**

Options	No. of Respondents	Percentage
Spicy	112	64.7
Sweet	45	26
Salty	10	5.8
Sour	4	2.3
Bitter	2	1.2
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.4 Food taste preference**

Humans have receptors in taste buds that detect the five well-recognised, basic taste and flavour elements of food. From the above collected data, it is clear that a huge majority of the population prefer to consume food prepared with pungent

spices like chillies and peppers most of the time to any other kind of food. Sweet food items were chosen by only 26% of the respondents. Surprisingly salty food items, anticipated to be preferred by many, were only chosen by 5.8% of the

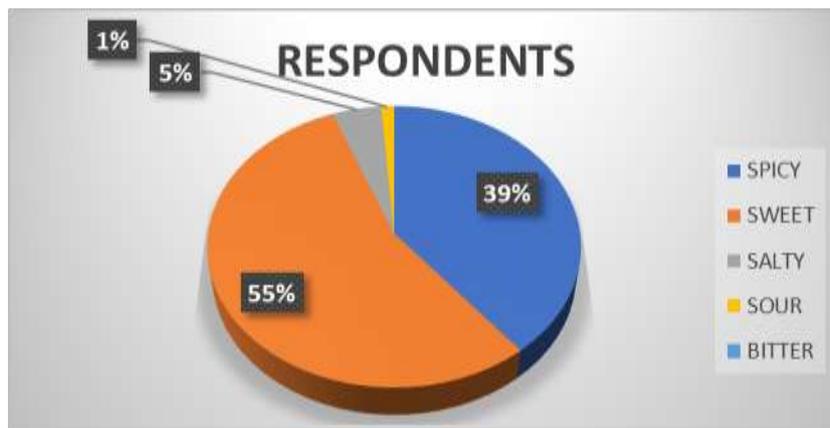
respondents. Since potato chips are a hugely popular salt-laden snack consumed by hundreds of people all around the world, it was naturally assumed that a decent percentage would go opt for this category of foods. While salt does enhance the flavour of foods as a vital seasoning, those hardwired with a preference

for salty taste choose to eat foods rich in sodium. Preference for sour food items that have a tangy or tart taste such as fermented and pickled foods, is seen to be almost 2.3%, coming in the second place with bitter food items being chosen the least.

**5. Which food type helps uplift your mood or makes you happy?**

**Table 5. Indicators that denotes happiness through food**

Options	No. of Respondents	Percentage
Spicy	67	38.7
Sweet	94	54.3
Salty	8	4.6
Sour	2	1.2
Bitter	2	1.2
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.5 Happy index**

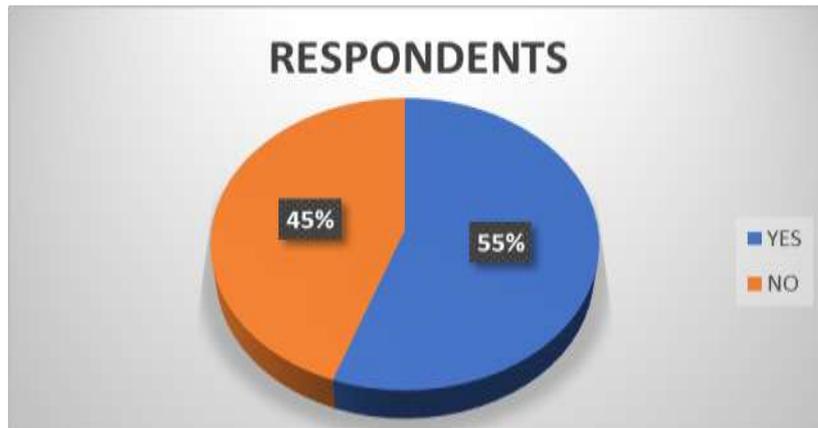
The above data clearly shows that most people relate happiness with sweet food with over 54.3% enjoying sweet treats as they boost their mood, and induce positive feelings by releasing happy hormones and feel-good chemicals. Spicy food is not that far behind with 38.7% people choosing it although food items with a high spice quotient can put taste buds on fire and burn the mouth. Salty (4.6%) and sour (1.2%) food items too are preferred by some people but are comparatively very low. It is

surprising that there are people who like bitter tasting food despite a majority disliking it. This category encompasses far more than only vegetables like bitter melon or fenugreek leaves and medication that leaves an unpleasant aftertaste of bitterness. There are a number of food items that are consumed on a regular basis in everyday life despite their bitterness and many adults acquire a taste for and often crave bitter foods, such as alcohol, coffee, dark chocolate, and so on.

**6. Do you eat more when you are stressed, angry or bored?**

**Table 6. Compulsive eating habit**

Options	No. of Respondents	Percentage
Yes	96	55.5
No	77	44.5
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.6 Stressed eating**

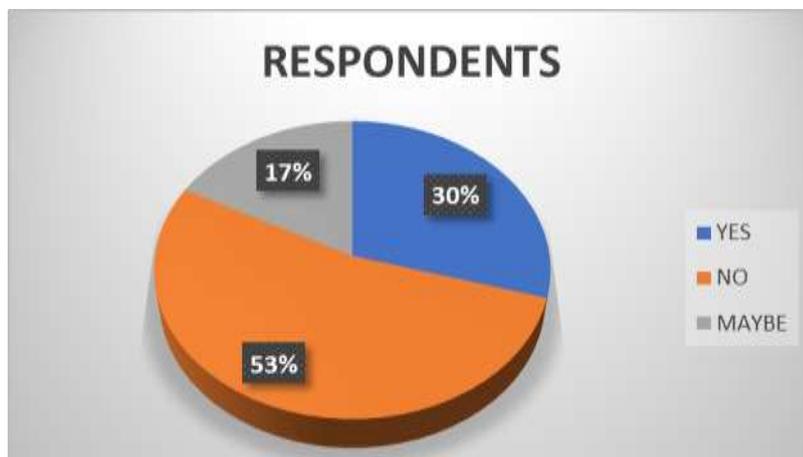
Very often people tend to eat more when they use food as a coping mechanism against negative emotions such as stress, sadness, worry, anxiety, boredom, fear, nervousness or even to just prolong their duration of joy. In addition to making them feel better, food equips them to manage their emotions and difficult situations. It also serves as a welcome distraction from unpleasant emotions, offers relief from distressing events and serves as a means of escapism. From the above collected data, it is noted that more than half the people have a habit of eating not to satisfy hunger but to suppress, soothe, distract or deal with emotional changes that they feel they cannot handle. The easy

availability of myriad food options has only served to increase consumption levels. It is important to keep in mind that easily available processed food items are generally fried items and other junk food loaded with calories that have negative health effects on the body due to high levels of added salt, sugar, oil, chemicals and saturated fats. So, continuing this psychological eating habit and improper eating behaviour for a prolonged period of time must be halted at the earliest and a corrective method must be devised to avoid binge eating and establish healthy eating habits.

**7. Have you ever felt that food has control over you?**

**Table 7. Food taking control**

Options	No. of Respondents	Percentage
Yes	51	29.5
No	92	53.2
Maybe	30	17.3
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.7 Belief over Food taking control**

It is important to control what one eats, how often one eats and the quantity one eats. Eating too little to avoid weight gain, eating too much on a regular basis without regulation and eating without a need to satiate hunger indicates a problem of food consumed taking control over a person and can lead to two types of eating habits:

- One, where the body is deprived of even the basic requirement of food with a severely restricted diet to

keep up with the unrealistic standards of an ideal body image set by the society and with a constant obsessive need to achieve that standard due to dissatisfaction with the body. Eating disorders like anorexia and bulimia, preoccupation with weight loss, fear of putting on weight, skipping meals and restrictive diets are abnormal behaviour that is increasingly prevalent among youngsters nowadays.

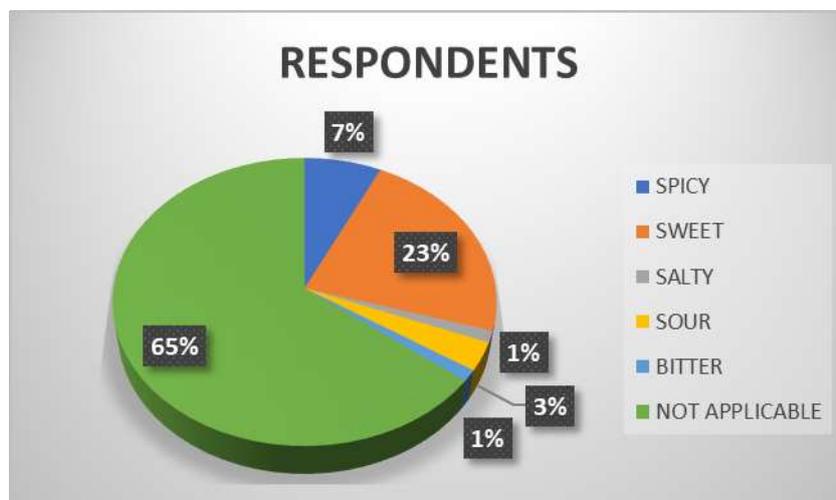
- Two, where large portions of food are frequently consumed and eating spirals out of regulatory control into a compulsive behavioural disorder attributed to emotional changes or guilt eating. It reaches a state where the binge eater cannot stop or control himself / herself from overeating.

It is a positive note here from the data that most people do not feel controlled by food. But it must be borne in mind that the issue of losing control over food intake may go unnoticed by many due to metabolic differences between people due to their body types too.

**8. Ladies, which food type helps you with your period cramps or cravings?**

**Table 8. Period cravings**

Options	No. of Respondents	Percentage
Spicy	11	7.1
Sweet	35	22.6
Salty	2	1.3
Sour	5	3.2
Bitter	2	1.3
Not Applicable	100	64.5
<b>Total</b>	<b>173</b>	<b>100</b>



**Fig.8 Food cravings of women during periods**

Premenstrual syndrome manifests in more than 150 varying symptoms because of fluctuating hormones but the most frequently experienced and reported are increased appetite and food cravings, particularly for carbohydrate, salt and sugar rich foods, which can help boost the mood prior to the menstrual cycle. Since most of the respondents happened to be male, the 'not applicable' option is evidently chosen more. Among the female respondents, most have chosen sweet food items to satiate their craving for sugar. Next comes spicy and a small percentage of women have chosen salty (1.3%) and sour (3.2%) snacks and food items as comfort foods. And, as anticipated, bitter foods are at a low 1.3%.

**FINDINGS, SUGGESTIONS AND ANALYSIS**

- During the course of collecting all the data needed for the present study and analysing the gathered data, it is clear that people are a bit hesitant to give a clear answer when presented with a question. If there is a possibility to give an answer as neither *Yes* nor *No* which are both close-ended, then everyone prefers to select that option, i.e. *Maybe / Possibly / Don't Know?*
- The study offers insights into the basic food habits and eating behaviour of the selected study group, the

flavours they prefer, the frequency of eating, food consumption pattern, food choices, etc.

- Modern society is obsessed with food, there is a huge demand for exotic cuisine by the upcoming generation who snack often and love experimenting with different flavours of food, and there is greater awareness of the benefits of healthy eating. Food is constantly in the spotlight as there is a perennial search for innovative fusion dishes, creative presentations and new food experiences. Food consumption patterns have undergone a radical change, food trends shape consumer behaviour and there is fresh vitality in the food industry with an evident passion for food. The analysis of the collected data reveals that the elder category of people has a very different view about this topic of discussion.
- It is important to bear in mind that the limitation of the present study is that the ratio of men to women who participated in this study is not the same which indicates that the resulting answers to the posed questions may vary accordingly.



### Influence of Molecular Gastronomy

The visual appeal of the presentation of food that is placed on the table has an equally important role as the ingredients that go into the making of the dish. Food plating techniques help to enhance the visual allure of food and entice the appetite with an artistic blend of colour, size, arrangement and texture. The food is first a visual treat for the eyes with an enticing presentation. The aroma that wafts from the dish reaches the nostrils and is captured by the olfactory senses. The brain reacts to sensory inputs and cues received from the sight and smell of food, it anticipates what the food item will taste like and accordingly prepares the taste buds, making the mouth water in anticipation. Lastly, one takes a bite of the dish and the taste buds are stimulated to enjoy its flavour, its texture, the feel of the food in the mouth and the explosion of several flavours with every succeeding mouthful (Giang, 2023).

However, the modern culinary science of molecular gastronomy has changed the traditional and conventional manner of cooking with new techniques exploring ways and devising methods to transform dishes into culinary masterpieces. It involves novel and unexpected ways of creating and presenting food with improved taste and flavour after a thorough study of the interactions between ingredients and an understanding of the chemical and physical processes that occur during cooking. Such experimental futuristic cooking reinvents dishes by exploring aspects like brain imaging and flavour perception to produce gastronomic wonders. The first look can be confusing and deceptive. Skilled practitioners tweak the taste and appearance of dishes in their attempt to offer an entirely new and unexpected culinary experience. Molecular gastronomy is a new field in the food industry that combines technical, artistic, and social elements in the creation of novel foods that are a treat for the senses with a blend of unusual ingredients, textures, taste and flavours.

### CONCLUSION

In summary, it can be stated that research on the relationship between food, eating behaviour and emotions is a complex and interdisciplinary field that offers many opportunities for exploration and discovery of how food impacts the brain and behaviour. Scientific studies on eating disorders and the psychological issues triggering food cravings highlight the complex interplay between biology, psychology, and culture in shaping the emotional associations that people have with food. Future research in this area will help to identify effective strategies for fostering a healthy relationship with food and mindful eating, wholesome food choices and improved eating habits for enjoying optimal health and overall sustained emotional wellbeing.

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