

# FOOD ALLERGY AND CONSUMER BEHAVIOUR

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## sCHAPTER-1

### **Introduction:**

“Food allergies is caused when the human body's immune system reacts to certain proteins in food.”

Intolerance to foods may result from the immune system of the human body being triggered through specific amino acids present in diet. Most of the population are identified with food intolerance. It is identified that 8% of the children population and 4% of the adults suffer from food allergy/intolerance at the United States of America. The allergic symptoms due to food generally is identified through swelling/budging of skin, reddishness and itching over the skin, nauseous symptoms, difficulty in breathing, loose stool, and hives. These are few major symptoms experienced due to food reactions in the body, worser situations can cause extreme dehydration which may even be life threatening. Hence, Food allergy needs to be treated and should be in control with food intake as per the allergy caused. If any allergic reaction is identified, it should be immediately consulted with the doctor/allergist.

Consumer behaviour refers to the actions and decisions made by the people when they buy and use a product. Regarding food, consumer behave mainly depends upon the quality of the product, quantity of the product and cost of the product. Specifically, consumers those who are allergic to food products depend on many other factors such as “gluten free”, “lactose free”, “peanuts free”, “sugar free”, “eggless”, “Wheat based flours” and few others. Hence, the intolerant people check these on the labelling's of the product and decide if its right for them. Products needs to design in a way where the intolerant consumers can also have it their day-to-day life. This had led to production of allergic friendly food products in the market. These products in specific should well designed with respect to the labelling of the nutrients involved, highlighted texts such as gluten/lactose free, and proper mentioning of production and expiry dates. The restaurants have also started serving allergic friendly food products as per the customers' requirements. The food allergy has also improved the growth of allergic friendly food products in the markets.

The research has covered the food allergy and consumer behaviour by performing qualitative and the quantitative analysis. The research has involved the world's biggest retails market retailers

such as Walmart, Lidl, Spar, Carrefour, Lulu, ShopRite, DMart. Various data was collected from these retailers, such as availability of types of food products in their markets, allergic friendly food products and their labelling details, and customer feedback/requirements.

Milk contains more than nine essential ingredients, including carbohydrates, vitamins, minerals, and lipids, which are many of them are essential for bones to function properly. These essential elements are found in addition to calcium. Having milk consistently as a child improves the vision, promotes red blood cell production, provides you phosphorus for energy and vitality, magnesium for muscle tissue, calcium for teeth and bones, and protein for body growth and repair. potassium is needed for nerve function and carbohydrates for energy. All of these nutrients help you feel energised all day long and support healthy bodily function.

Regular consumption of milk can assist you in getting a restful night's sleep, which is crucial in a demanding existence. It also keeps your skin radiant and supple. A glass of milk every day is generally very good for your health.

The lactose in milk can't be completely metabolised by individuals who are lactose intolerant. diarrhoea because abdominal discomfort, and gas follows intake of dairy-based products. That medical condition, referred to as lactose malabsorption, usually rarely dangerous, but its symptoms can be uncomfortable.

Lactose intolerance is usually caused by insufficient levels of lactase, an enzyme made in the small intestine. Dairy products are digestible even with low lactase levels. However, if your levels are too low, you become lactose intolerant and cause symptoms when you consume dairy products. You can control it.

The research mainly targets the consumer behaviour towards the availability of the food products in the market.

### **Limitations:**

Food allergy can significantly affect the consumers, hence consumer with allergies are very keen about the food they choose to eat on a regular basis and which wouldn't lead them to any type of allergic reactions. The major limitations they face are as follows:

- Limited choices on food: There are very limited choice of allergic friendly food in the markets. As per the analysis of the research every market sells a limited quantity of the food products in specific to the allergens.
- Higher cost: The available allergic friendly foo products are at higher rates than the normal foods. Which makes the consumers feel isolated among the society as well.

## **CHAPTER-2**

### **Aim of the Research:**

Our research aims to understand how food allergies affect consumer behaviour in the context of food purchase, consumption, and product preference, with a focus on the relationship between food allergies and consumer behaviour. We will examine how food allergies affect consumer behaviour in areas such as information-seeking behaviour, reading product labels, brand loyalty, and product choices by questionnaire.

This would help us understand how food allergies influence consumer decision making, it will be possible to identify strategies that help to ensure that food-allergic consumers have access to safe and reliable food products, as well as to understand the implications of food allergies on the food industry. This research will also provide insight into how food allergies can influence consumer behaviour in the context of food safety, health and wellness, sustainability, and other important factors. This research includes how the retail markets supplies food allergic friendly products to the consumer in all aspects. As a result of this research, consumers' choices and preferences will be better understood through an examination of the impact of food allergies on consumer behaviour with respect to the availability of the food products in the markets in and around the world, as well as for food industry stakeholders, policymakers, and healthcare professionals to learn how to better communicate information about food allergies to consumers and meet the needs of consumers with food allergies. The research a includes a consolidated data of various retail markets such as Lidle(Europe), Walmart (U.S.A), Lulu(Middle East), Spar(Africa), ShopRite(Africa), DMart(India), Carrefour(Asia) .The data contains availability of allergic friendly food products such as nuts, fresh fruits and veggies, meat and poultry and bakery items. Hence, using the collected data we can calculate the percentage of allergic friendly food products in the world and improve the availability of more food products to the allergic consumers. Consumers with food

allergies and the food industry can both benefit from the findings of this study, which could have implications for the development of products, marketing strategies, and public health policies.

### CHAPTER-3

#### **Literature Review:**

Allergies to food, particularly affect millions of humans of all ages worldwide, remain an important issue for the public's health. Food allergies possess an immense effect on buying habits because individuals who suffer from allergies must be mindful concerning what they eat as well as make sure they avoid any allergens that trigger a reaction. The effect of allergies to foods on food choices, the importance of labelling and food regulations, and the challenges faced by individuals with food allergies in social environments are just some of the important subjects which came through a review of the literature on examines on food allergy and consumer behaviour.

Food allergies may significantly decrease the variety of products one may select from as well as influence purchasing habits, based on the studies. Individuals suffering from food allergies regularly depend on particularization food items, and this tend to be more costly and harder for them to find. As a result, when making purchasing choices, individuals with allergies to certain foods may prioritise food safety above of other concerns like taste or convenience. This might additionally contribute to an increase in the possibility that individuals with food allergies will prepare meals at home instead of go out for a meal or attend social occasions that involve food. Regulations and product packaging have been identified to be significant factors impacting consumer behaviour in connection with food allergies. In many countries, rules regulating the labelling of foods have been placed into effect in order to help those with allergies to make intelligent decisions regarding their diets. The need for uniform branding across products and countries emerges through conclusions suggesting that many consumers find food labels quite confusing.

The literature additionally points out the obstacles that individuals with food allergies come across in everyday situations. For people affected by food allergies, social gatherings can be particularly challenging as they may feel excluded nor afraid to participate. Those that suffer

from food allergies result in social isolation, which may have a negative impact on the way they feel.

The analysis as a whole highlights the huge impact that dietary allergies exert on the behaviour of consumers, covering all that from dietary preferences and purchasing habits to social interactions. In order to create more inclusive environments that accommodate persons with allergies and ensure their safety and wellbeing, there is a need for enhanced awareness of and understanding of food allergies. To discover techniques that can help individuals who suffer from food allergies in making conscious food choices, additional research is also necessary to further comprehend the factors which impact consumer behaviour in the context of food allergies.

### **Primary Studies**

Food allergy and its impact on consumer behaviour have been the subject of extensive research. This literature review aims to provide a review of that research. According to the Food Standards Agency 5<sup>th</sup> March 2021, In order to help consumers understand allergen labelling and advisory statements, CCFL considered evidence-based consumer understanding (Codex 2019). Consumers can identify allergens and comprehend information about them more easily if allergen information is repeated across different locations on the label. As a rule, consumers preferred large fonts, boldening, and contrasting colours when highlighting allergens. As a result, consumers prefer allergen information to be presented in a consistent format and location. It is believed that this allows information to be identified more easily and quickly.

According to the DR Altman, LT Chiaramonte - Journal of Allergy and Clinical Immunology, 1996 – Elsevier. An extensive, demographically balanced survey was be conducted to obtain an understanding of the extent and characteristics of the American public's belief in food allergies

According to a study published online on June 07, 2022, by Charis. M. Galanakis,( Having a transparent food safety and health system always raises questions such as what the product is made of, where it comes from, how it is made, and what additives are used. As a result, clean labels are increasingly advancing and developing in the food industry. Generally, "clean label" is a huge trend in the food market (Cheung et al. 2016), referring to challenges related to food safety and health

from the perspective of maintaining the environment's sustainability. This term is a relatively new one in the food industry.

According to a study Published online 2019 Mar 5, by Peter J. T. Dekker, Damiet Koenders, and Maaïke J. Bruins, the dairy industry's fastest-growing subsegment is the lactose-free dairy market. Over the projected period, lactose-free cheese was anticipated to expand at the quickest rate (8.4%). Latin America is the next-largest and fastest-growing lactose-free market after Western Europe.

According to this article Understanding how consumers with food allergies make decisions based on precautionary labelling, published on 09 August 2019, by Audrey DunnGalvin, Graham Roberts, Lynne Regent, Moira Austin, Fiona Kenna, Sabine Schnadt, Angel Sanchez-Sanz, Pilar Hernandez, Bettina Hjorth, Montserrat Fernandez-Rivas, Steve Taylor, Joseph Baumert, Aziz Sheikh, Sian Astley, Rene Crevel, Clare Mills. The article was based on understanding consumer perceptions crucially if effective food safety policy and risk communication are to be developed and implemented and to understand how consumers living with food allergy assess risk with precautionary allergen labelling (PAL) and their preference in how risks are communicated within a quantitative risk assessment (QRA) framework. It was concluded that consumers have to know what process has actually taken place for the placing of a PAL and/or risk assessment statement on a particular food product. Their findings provide a result for the development of policymaking in the context of the legislative requirements of the European Union's Food Information for Consumers Regulation. More informative communication around food allergen risk and safety and support evidence-based

According to an Article published in the University of Life Sciences in Lublin, The ability to make enough lactase to break down the sugar in breast milk is often present at birth. But by the age of three, almost two-thirds of the world's population ceases producing large amounts of lactase, which causes varied degrees of poor lactose absorption. Adults and adolescents with hyperlactation may only have a 5–10% lactase activity. This article also says that Lactose-free products are an example of a new, innovative milk product that has unique qualities targeted towards a certain consumer demographic. The global lactose-free market is expected to grow in value according to trends. One of the first studies of its kind in Poland set out to determine how

wellinformed young consumers were about lactose-free goods to inform industry suggestions. Knowledge of these products was assessed from respondents (n=240) in a Polish university context using a three-part questionnaire. In the study, few young individuals knew exactly what a lactosefree product was.

According to Chartered Association of Business Schools. 2020, Marketing is a crucial component that aids businesses in connecting with clients and possible target markets in society. Businesses that have used smart marketing techniques outperform those with ineffective ones in the marketplace. In each company, conducting marketing operations can be done in a variety of ways.

Secondary studies:

In order to survive, people need to buy, select, prepare, and eat food. Eating not only satisfies basic demands but also depicts relationships and interactions between people, as well as aspects of their culture and the society in which they live (Axelson 1986). The average individual makes over 200 eating decisions each day, but they may not always be conscious of it (Wansink & Sobal 2007). A few interconnected elements affect these dietary decision-making processes. A chronic illness like a food allergy, whose management relies heavily on avoiding the offending food, may be one of these factors (Boyce, Assa'ad, Burks, Jones, Sampson, Wood, et al. & NIAID-Sponsored Expert Panel 2010). Food allergies affect people of all ages, and since eating foods that cause allergies can be fatal, they are likely to alter how people choose their foods and the quality of their diets. Despite the controversy surrounding milk and calcium, one thing is certain: Getting enough calcium is essential for both bone development and non-bone processes, as well as for lowering the risk of osteoporosis. Studies on maximum calcium retention, which look at how much calcium can be driven into bones, indicate a high demand. According to the US National Academy of Sciences' recommended intake requirements (Harvard School of Public Health, 2013), 95% of the population must consume this much calcium.

- 1,000 mg day-1 for those aged 19-50
- 1,200 mg day-1 for those aged 50 or over
- 1,000 mg day-1 for pregnant or lactating adult women

The Institute of Medicine (IOM) updated its calcium dietary reference intakes in 2010. These recommendations were developed to enable the majority of people to attain and maintain good bone health. They are based on an examination of more than 1000 studies and reports.

Therefore, it is important to inform and educate the public about the advantages of lactose-free milk. Because customers are aware of the variables influencing the acceptability of new products, it is crucial that they consider flavour and product style in addition to food safety and health advantages (Yiridoe et al., 2005).

Consumers will be crucial to a business-to-business initiative's success, claims Wang's (2010) study. The results also demonstrated that brand preference had a strong positive impact on purchase intention and served as a bridge between the intention to buy and a variety of perceived product attributes

## **CHAPTER-4**

### **Research Methodology:**

#### **Introduction to Methodology:**

A questionnaire was designed to explore the market for consumers with lactose intolerance conditions. We prepared the survey to find out what these lactose-intolerant consumers thought about the options available in the market and how satisfied they were with the options available to them. This survey was conducted using google forms. The data collected was analysed to understand the opinions of the consumers and to understand the market. This part will explore the characteristics of the sample population, methods of collecting data along with the materials used for the study. The results of the finding are discussed in the next section of this paper.

To understand the prevalence of food allergies and consumers' purchasing behaviours, a quantitative approach using surveys or questionnaires is made and circulated among them. To explore consumers' perceptions and experiences of managing food allergies, a qualitative approach using interviews is done by conducting interview the retail markets manager. The research design is in such a way where the consumers are enquired about their food choices through set of questions and this data helps to calculate the percentage of food allergic people. Further the research involves in the collection of data from the largest retails markets from different continents such as Europe, Africa, U.S.A, Asia, (INDIA), Middle East. This data helps to calculate the ease of access of

allergic friendly food products in the market Hence, the availableness of such food products can be improved as per the consumers requirement.

### **Recruitment of Participants:**

The questionnaire's URL was shared with numerous friends and family members as well as on various social networking sites. To increase the sample size for this study, each participant was asked to further spread the link within their social network. The survey was filled out by a total of 127 people, but only 89 (71%) of those responses were included in the analysis since the lactosetolerant respondents were excluded from the sample. 16 years of age or older was the minimum age limit for this study. The contestants were split between two continents: Asia and Europe, respectively. America, Africa, and middle eastern nations sent responses; however, they made up only 17.4% of the sample population overall.

The decision to participate in the study was up to the participants. The study's goals and objectives were briefly explained to the participants before the study officially started. The questions were written in straightforward English so that participants from various walks of life could understand and respond.

The participants were once more urged at the end of the questionnaire to let their friends and family know where to find the questionnaire link.

### **Procedure:**

Both quantitative and qualitative analyses were used to advance the research. Data on consumers who have food allergies or intolerances was gathered and consolidated using a quantitative technique. By learning how many customers have allergies to a small number of food goods and how they chose their daily needs from the market depending on the labelling of the food product and the nutrients in it, it helped to improve the research. The qualitative approach was done amongst the continents biggest supermarkets based on availability of allergic friendly food products.

The **quantitative approach** was done as stated below:

- The participants were recruited through links shared via social media platform such as Facebook, Instagram, WhatsApp, etc. there was a total of 127 responses collected for this study. Among the 127 participants, we could only consider 89 responses as the other 38 participants were lactose tolerant. In this study, our aim was to consider the opinion of lactose intolerance.
- Thus, other responses had to be ignored. These 89 participants were the sample population in the study. We also collected data of the participant's age and country of residence.
- The actual questionnaire for the study started in the third section which consisted of 4 questions. The questions were framed in simple English and were on point to avoid unnecessary misunderstanding. Of the 4 questions 3 were marked mandatory and they were also close ended questions. Although the fourth question was still a part for the study, it wasn't mandatory, and it was open ended so that the participants could better express their opinion.
- The questions asked were if the participants avoid milk products completely or find alternative to satisfy their cravings; if they think that there are adequate substitutes in the market for lactose products; whether they think that they're missing out a lot because of this condition; and the final open-ended question about what change they would recommend being brought into the market to better satisfy people with this condition.
- The data collected from the sample population were gathered and fed into the spreadsheet which made it easier to assess and conclude. To maintain the anonymity of the participants, the findings in the study are presented as averages only.

The **qualitative approach** was done as stated below

- Data were gathered from the United States, Europe, the Middle East, Asia, and Africa, from various retail markets where allergy-friendly food products are sold are listed in this data.
- A qualitative study was conducted by interviewing the managers of the retail markets about the various types of products available in the store and how they can increase the availability of more allergic friendly food products to the customer. The types of allergic friendly food products present in each supermarket were compared.

- Additionally, the information reveals how supermarkets consider customer requests and suggestions to improve product availability. The information also includes the labelling on food goods from various companies and instructions for consumers. and how the consumer can differentiate the intolerant vitamins and other nutrients processed in the products.

### **Retail Market leaders of Five regions**

**The Biggest retail markets from the 5 continents are listed below:**

1. Walmart (USA)
2. Lidl (Europe)
3. Lulu (Middle East)
4. Spar (Africa)
5. Shoprite (Africa)
6. Carrefour (Asia)
7. DMart (India)

### **WALMART (U.S.A)**

#### **Introduction:**

Walmart, established by Sam Walton in 1962, is one of the world's largest affordable retail chains with headquarters in Arkansas. With a wide array of products including food, clothing, electronics, toys, and household appliances, Walmart operates under 56 different brand names, such as Asda in the UK and Seiyu in Japan, over 11,000 stores in 27 nations. Walmart offers convenient online shopping alongside physical stores, with a priority on reasonable pricing and a comprehensive supply chain, purchasing power, and operational efficiency. Its goal is to become a one-stop-shop for customers across multiple products and services with an accessible and

affordable purchasing experience while delivering profits for investors. Over time, Walmart has prioritized sustainability and community involvement with ambitious targets for reducing carbon emissions and renewable energy usage, along with local support programs that foster employment and offer disaster relief.

### **Food offerings at Walmart**

Shopping at Walmart provides a varied selection of edible items, from fruits and vegetables to animal-based products and packaged snacks. Varieties, including locally sourced or organic produce, and specialty meats like grass-fed beef, can be found. Furthermore, non-dairy substitutions such as soy or almond milk are offered, in addition to freshly baked bread, confections, and pre-packaged treats like cookies and cupcakes. Walmart seeks to offer a wide assortment of international cuisine in order to accommodate customers with different dietary needs and tastes. Ultimately, they endeavor to provide quality products at affordable prices to satisfy the requirements of their varied customer demographic.

### **Walmart provides allergic friendly food products.**

Walmart has a wide variety of food alternatives to satisfy different dietary needs and tastes, including gluten-free bread, pasta, snacks, and baking supplies. Along with nut-free delicacies like spreads, baked goods, and snacks, they also provide dairy-free substitutes like cheese, yogurt, and ice cream. In addition to kosher goods like meat, Passover items, and dairy products, vegan choices including plant-based meat replacements and desserts are also offered. Customers can choose products that are suitable for them by checking for product labeling or by getting advice from a trained dietitian or healthcare provider.

Food allergic consumers can choose food products from Walmart by taking the following steps: When purchasing food from Walmart, it's important to carefully read the product labels to look for any components or allergies that might cause a response. To make any potential allergies very clear, seek out lists of ingredients or allergy warnings.

Choose items that have undergone testing and been proven to be free of certain allergies.

Walmart sells a variety of products with this certification. To find certified items, look for labels like the Gluten-Free Certification Organization (GFCO) or the Non-GMO Project Verified logo.

For consumers with food allergies, Walmart's website offers a variety of tools and information, including a product search engine which allows users to filter goods by dietary restrictions. In order to learn what other customers, especially those who have food allergies, have to say about a certain brand, customers may also browse reviews and ratings of products.

In general, shoppers with allergies to foods should take initiative when they visit Walmart, carefully reading the nutrition information and conducting their research to ensure that the items are suitable for their dietary needs.

Walmart gives its customers' demands first priority and carefully considers any recommendations or grievances they may have. In order to respond to consumer requests for food goods, Walmart has a protocol in place.

provided a consumer requests a certain food item that the shop does not already carry, Walmart may take the request into consideration provided the item meets their requirements for quality and demand. Walmart product specialists are in charge of reviewing customer requests and selecting new products to carry.

Walmart also invites consumers to provide their thoughts on the standard and accessibility of food goods as well as their overall shopping experience. The business considers this feedback when deciding what goods to carry and how to enhance the general client experience. In general, Walmart is dedicated to fulfilling the demands and desires of its clients and makes aggressive efforts to guarantee that their stores provide a broad selection of high-quality food goods that satisfy the various requirements of their clientele.

## **LIDL(EUROPE)**

### **Introduction:**

Lidl, an economical retail chain, originated in Germany in 1973 and has since extended to more than thirty countries, employing over 310,000 people in over 11,000 stores. The focal point of Lidl's business approach is giving customers high-end products at reasonable prices by managing an effective and lean supply chain, minimizing expenses and providing few private label goods. Lidl stocks fresh produce, meat, cheese, milk, baked goods and essential household items. It also sells non-food items such as clothes, electronics, and housewares.

In addition to placing significant importance on quality and pricing, Lidl is also committed to sustainability and social accountability. Addressing environmental concerns, like using clean sources of energy and decreasing its waste output, are some of the ways the company has been trying to reduce its impact on the environment. Lidl also partners with charitable organizations to support and address issues like hunger and social welfare within communities. Lidl attracts customers who prioritize morality and the environment in their purchase considerations with their commitment to social responsibility and sustainability.

Lidl offers a selection of food items in flavors that are suitable for those with food allergies and intolerances. In order to assist customers in making educated purchasing decisions, they either reveal this information on the packaging of their products or on in-store signage.

In addition, Lidl offers a variety of free-from products that are specifically made to be gluten, lactose, and nut allergen-free. Because these items are clearly labeled with the allergens, they are free from, customers may choose products that are suited for their dietary requirements more simply.

Lidl cannot guarantee that its goods are completely free of allergens, however, as they are produced in factories that also manage other allergenic substances. Customers with serious allergies to foods should always read the labels closely and take the appropriate precautions before ingesting items from Lidl or any other shop.

### **Offerings at LIDL:**

Lidl offers a variety of free-from products to accommodate different dietary needs. Lidl products often don't contain the following allergens:

Gluten: Lidl has a wide selection of products that are free of gluten, including bread, pasta, flour, cereals, and snacks.

Dairy: Lidl sells dairy-free versions of milk, yogurt, cheese, and ice cream produced from materials derived from plants.

Nuts: Lidl offers a variety of nut-free baked products, cereals, and snack bars.

Soya: Lidl offers products free of soy, such as vegan milk, meat alternatives, and snacks.

Eggless pasta, salad dressings, and baked goods are all available at Lidl.

In order to meet the varied dietary requirements and tastes of its customers, Lidl offers a range of items. They have a dedicated team of culinary experts and nutritionists who search for and develop items to meet the needs of the clients.

Information on allergies and nutritional advantages is also provided by Lidl on the labels of its items and on in-store signage. This helps customers to make informed purchase decisions by ensuring that they are aware of any potential allergies or components that might not be suitable for them.

To keep up with changing customer trends and tastes, Lidl also constantly modifies its product lineup. As an example, in response to the increasing demand for vegan and vegetable-based goods, they have increased their variety of these kinds of products.

Lidl's affordable rates on its products also make it easier for consumers to get hold of healthier and allergic reactions-friendly food products.

In general, Lidl works to provide a wide range of products that meet different dietary demands, tastes, and budgetary restrictions, while simultaneously being sure that their products are of excellent quality and meet consumers' expectations.

## **LULU (MIDDLE EAST)**

### **Introduction:**

During the early and 1990s, the Lulu Hypermarket - an extensive network of retail stores - was established in the United Arab Emirates (UAE). The hypermarket network is owned by the Lulu Group International, which has its headquarters in Abu Dhabi and has eventually expanded to various countries. It has rapidly grown to include countries in the Middle East, Asia, and Africa. Famed for offering a broad assortment of things all under one roof, this hypermarket sells groceries, electronics, apparel, toys, and household goods. Its mandatory establishments range between an unfathomable 80,000 to 230,000 square feet, guaranteeing that you will never feel suffocated or claustrophobic in this Herculean grocery empire. But what makes this fractious mega-store so intriguing is its deeply intrinsic and immersive shopping experience, a hallmark of its otherworldly shopping philosophy that emphasizes customer satisfaction above all else. The

chain of hypermarkets has received various honors and recognition for the superior products, responsive service to customers, and positive influence on the economy. Lulu Hypermarket was the top retailer around the Middle East region in 2017, as reported by Deloitte.

### **Offerings at Lulu:**

1. At Lulu Hypermarket, consumers with special dietary requirements may discover a selection of food items that are allergic-friendly. If you are allergic to certain food products, Lulu Hypermarket provides the following food items, just to name a few:

- **Gluten-free products:** The Lulu Hyper Market carries an extensive selection of gluten-free products, such as flour, bread, spaghetti, pasta, biscuits, and desserts. These products can be used by those who are diagnosed with gluten intolerance.
- **Lactose-free products:** Lulu Hypermarket also offers a variety of lactose-free products, including alternatives for milk, cheese and yoghurt made up of plant based ingredients. These products can be consumed by those who are intolerant to lactose or sensitive to lactose.
- **The Lulu Hypermarket has granola bars, biscuits, and snack items that don't contain any nuts.** These products are safe for use by those with nut allergies.
- **Products without soy:** The Lulu Hypermarket offers products without soy, including dairy products, sauces, and imitation meats. These products can be used by that have an allergic reaction to soy.
- **The Lulu Hypermarket carries products that are free of eggs, such as egg-free spaghetti, egg-free mayonnaise, and egg-free desserts.** These foods are safe for consumption by those with egg allergies.
- **The Lulu Hypermarket frequently offers a variety of allergic reaction-friendly food products to satisfy the needs of those with dietary requirements.** Always carefully examine the packaging and label of a product to ensure that it is suitable for the particular allergy or intolerance.

Consumer reviews of the allergen-friendly foods offered by Lulu Hypermarket are largely positive. Due to the difficulty in finding suitable items elsewhere, numerous consumers who have specific dietary needs appreciate the wide variety of options accessible to them. Lulu Hypermarket, which is renowned for its commitment to customer satisfaction, provides food items that are allergy friendly. Usually, the business labels its allergy-friendly products

prominently so that customers may immediately identify them. Additionally, the employees are typically happy to assist clients in finding acceptable products and frequently educated about the numerous allergy-friendly alternatives offered.

Customers with special dietary requirements have typically expressed gratitude for the ease and selection of food items that are allergy-friendly that Lulu Hypermarket provides. Due to its commitment to accommodating the needs of each and every one of its customers, the company enjoys a positive reputation amongst persons that have dietary restrictions or intolerances.

## **SPAR(AFRICA)**

### **Introduction:**

Across 48 nations, there are more than 13,000 SPAR supermarkets. The business was established in the Netherlands in 1932, and its current headquarters are there.

The normal selection of goods available at SPAR supermarkets includes groceries, fresh produce, meat, dairy, baked goods, domestic goods, and more. Additionally, many SPAR locations have on-site bakeries, delis, and cafés.

The business uses a franchise structure, so each store is owned and run by a different independent retailer with permission to use the SPAR name and operating systems. This enables flexibility in local product offerings and pricing while still upholding the standard of excellence and reliability connected with the SPAR brand.

With programmes to cut waste, increase energy efficiency, aid local communities, and purchase goods from moral and ethical vendors, SPAR places a high priority on sustainability and social duty.

Overall, SPAR is a well-liked option for consumers searching locally and internationally for a convenient, dependable, and cheap supermarket experience.

In order to accommodate customers with dietary restrictions and allergies, many SPAR supermarkets offer a variety of allergen-free and allergy-friendly food items.

The products SPAR sells might be free of typical allergens like nuts, gluten, dairy, soy, and more, depending on the particular shop. To indicate that they are safe for people with particular

allergies, these goods may be marked as "allergy-friendly," "free-from," or have particular logos and symbols.

Additionally, some SPAR shops may employ personnel who are qualified to assist clients with particular dietary requirements and who can offer direction and suggestions on product selection. In order to ensure that you can shop securely and worry-free if you have specific dietary needs or allergies, it's a good idea to get in touch with your neighbourhood SPAR store to find out about their available product options and services.

Depending on the particular store and location, SPAR supermarkets may offer a different selection of allergen-free food items. For customers with dietary restrictions or food allergies, many SPAR stores do provide a variety of choices.

Generally speaking, SPAR supermarkets stock a range of allergen-free and allergy-friendly goods that satisfy various nutritional requirements, including things that are free from nuts, gluten, dairy, soy, and more. Fresh vegetables, meat, packaged foods, and other grocery things are examples of these products.

In some SPAR stores, there may be specialty foods catered towards individuals with dietary constraints or food allergies, such as vegan and vegetarian choices, lactose-free milk, and glutenfree bread. The range of allergy-free goods may vary per location, so it's recommended to consult with your local SPAR supermarket to explore the options accessible for your distinct nutritional requirements. If you have any concerns or questions about finding suitable food items for your allergies or dietary restrictions, you can always consult a team member for guidance.

Overall, many consumers like the large assortment of premium products offered by SPAR stores, particularly those that focus to allergies and dietary restrictions. Customers regularly encourage SPAR for its commitment to sustainability and social sourcing, which may also affect their purchase decisions.

Much SPAR locations welcome customer feedback to improve their services. Customers occasionally may make specific requests or suggestions for brand-new items they'd like to see on the shelves.

Generally speaking, SPAR supermarkets work to offer a wide variety of food items to cater to the requirements and tastes of their patrons. There might occasionally be shortages or out-ofstock products, just as in any supermarket.

## SHOPRITE (AFRICA)

### **Introduction:**

The majority of a retail supermarket chain named Shoprite are in Africa. The company, which was established in South Africa in 1979 and now has more than 2,800 outlets scattered across 15 countries, has grown to become one of the largest retailers on the African continent.

Shoprite locations provide a wide variety of commodities, including fresh produce, meat, dairy, baked goods, home items, and more. Many stores also operate their own bakeries, butcher shops, and delis. Pharmacies, clothing departments, and financial services could be offered at a select Shoprite site in addition to the basic services.

Because the company employs a franchise business model, independent retailers who have been granted permission to use the Shoprite name and operating systems are in control of managing each individual store. As a result, local government may be flexible.

Shoprite is well known for its commitment to offer consumers reasonable pricing, with an emphasis on continuously cheap prices on a range of items. Additionally, the company places a high value on its social responsibility and has put in place programs to support local communities, reduce waste, and promote sustainability.

Shoprite is generally regarded as a popular alternative for African customers seeking a wide variety of products at affordable rates as well as a commitment to sustainability and social responsibility.

Shoprite often have a wide selection of allergen-free and allergic reaction-friendly food products for consumers with specific dietary needs and allergies.

Depending on the area, Shoprite may provide items free of commonly encountered allergies including nuts, gluten, dairy products, soy, and others. These products may be labeled as "allergy-friendly," "free-from," or have logos and symbols to inform consumers that they are safe for those with allergies.

Additionally, some Shoprite locations may have staff members who are trained to assist customers with dietary needs and who can provide guidance and recommendations on product choices. If you have certain dietary restrictions or allergies, it's a good idea to phone your neighborhood Shoprite shop to find out about their available product selections and services to make sure they can meet your requirements.

It's an excellent concept to contact a nearby Shoprite shop and inquire about their line of goods and services if consumers have certain dietary needs or allergies to ensure that customers can buy securely and fear-free

## **CARREFOUR (ASIA)**

### **Introduction:**

Hypermarkets, supermarkets, and convenience shops are all part of the global network run by Carrefour, a multinational firm in the retail sector. Many Asian countries, including China, Taiwan, Malaysia, Indonesia, and Pakistan, are home to the company's hypermarkets. Customers may discover a broad variety of goods in Carrefour Hypermarkets in Asia, including groceries, fruits and vegetables, electronic devices, apparel, furnishings, and other consumer products. These gigantic hypermarkets, which range in size from 90,000 to 230,000 square feet, are widely recognized for offering a wide selection of goods under one roof. Customers may shop conveniently and thoroughly because to the room's size. Carrefour is famous for its dedication to environmental responsibility and moral purchasing. The business has undertaken a number of steps to reduce its negative impact on the environment, including cutting emissions of carbon dioxide, minimizing food waste, and supporting environmentally friendly purchasing practices. A range of services are provided by Carrefour Hypermarkets in Asia to improve the experience of shopping for consumers. In-store pharmacy, cafés, restaurants, bakeries, and ordering and delivering via the internet are some of these services. Thanks to the extensive product selection, dedication to environmental responsibility, and variety of services offered by Carrefour Hypermarkets in Asia, customers have an easy and enjoyable time shopping. In and throughout Asia, Carrefour offers a variety of allergic reaction-friendly food items to cater to clients' special dietary demands.

Customers with allergies may shop more easily at the store since it provides a wide selection of foods that are acceptable for them, including gluten-free, dairy-free, nut-free, soy-free, and eggfree goods. Carrefour's allergy-friendly items are easy for customers to recognize thanks to their clear labelling. The store's employees can assist customers in making the proper product selections. Carrefour Hypermarkets in Asia have a positive reputation with customers because to

their commitment to providing for people with special dietary needs. Carefully reading the label is essential to determining whether a product is acceptable for a certain allergy or intolerance.

## **DMART (INDIA)**

### **Introduction:**

In 2002, Radhakishan Damani founded DMart, a chain of supermarkets and hypermarkets in India, which has since expanded in popularity due to its value proposition and efficient supply chain management that allow for lower product prices. DMart's shops have a straightforward layout that provides stress-free shopping, and the business emphasizes excellent customer service through well-trained employees and a dedicated customer care team. Presently, DMart is one of the largest retailers in India, with 241 working establishments across 13 states, and plans for further growth in the future.

### **DMart offers a wide range of food groceries, including:**

- Fresh produce and veggies
- Milk, cheese, and yoghurt are examples of dairy goods.
- packaged foods like candies, chips, and biscuits
- cereals, rice, and beans
- spices, and condiments for use in cooking
- drinks and snacks
- frozen and canned meals
- Items such as bread, baked goods, and candy
- Instant mixtures and prepared foods
- Products for infant nourishment and baby food.

Despite not actively marketing itself as an "allergy-friendly" store, DMart provides an array of food products suitable for individuals with dietary constraints. The emphasis is mainly on delivering top-quality goods at affordable prices. This can significantly benefit individuals with allergies, as finding safe-to-eat alternatives can be hard, time-consuming, and stressful. DMart's inventory encompasses many dairy-free, nut-free, and gluten-free products, catering to

individuals with nut allergies, lactose intolerance, or celiac disease. The store also offers a range of vegetarian and vegan options, catering to those with particular dietary needs. In a nutshell, although not labelled as an "allergy-friendly" retailer, DMart's selection of food products can greatly aid individuals with distinct dietary requirements.

### **SOME OF THE RETAILERS WHO SELL ALLERGIC FRIENDLY FOOD PRODUCTS ACROSS THE GLOBE**

In various corners of the world exist online stores and supermarkets that offer a diverse range of food items that are tailored to meet the dietary requirements and restrictions of individuals. For instance,

Free From Japan is a unique Japanese online store that specializes in selling dairy-free, glutenfree, and allergy-friendly food products, along with a vast array of other household and personal care items.

Similarly, the Isetan Scotts Supermarket in Singapore provides a separate section solely for individuals with dietary restrictions, where they can find an assortment of foods such as pasta, snacks, and baking materials.

The GFC Bakery, found in Hong Kong, prides itself in crafting gluten-free bread, cakes, and sweets. In Germany, one can opt to shop at any of the organic supermarkets run by Alnatura, which boasts of collection of gluten-free, lactose-free, vegan foods, along with organic fruits, vegetables, meat, and dairy products.

Individuals residing in India can access a variety of organic vegan, gluten-free, and vegetarian food options at Nature's Basket, a well-known Indian grocery chain.

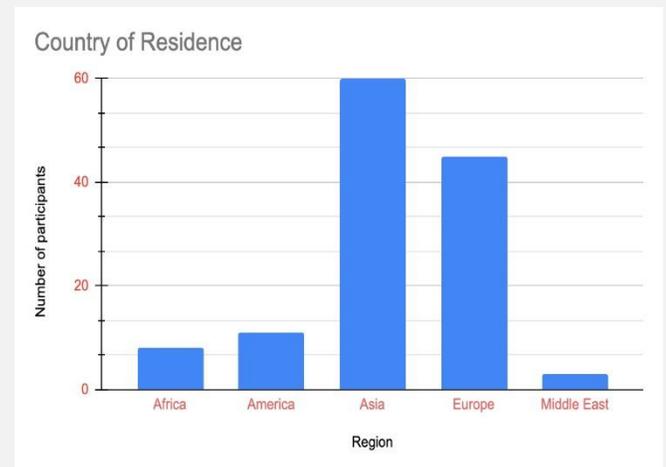
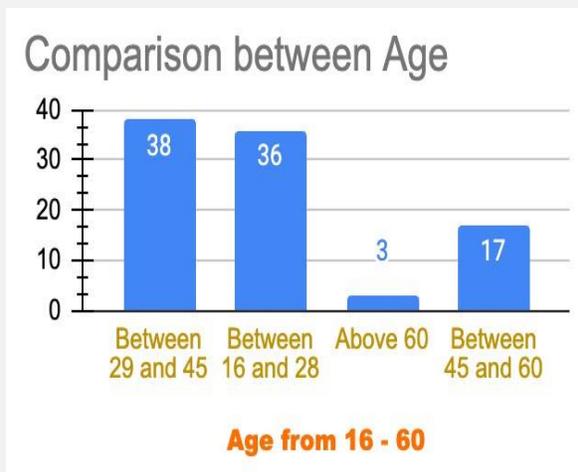
The French network of organic grocery stores, Bio c'Bon, offers not only organic meat, dairy, and produce, but also an array of dairy-free, gluten-free, and vegan food items.

## COMPARISON OF THE 5 REGIONS

MARKET	WALMART	LIDLE	LULU	SPAR	SHOPRIT E	CARREFOU R	DMART
<b>PRESENCE</b>	Worldwide	Europe, USA	Middle East, Asia	Europe, Africa, Asia	Africa	Europe, Middle East	India
<b>NO. OF STORES</b>	11,510	11,200+	209	13,000+	2,800+	12,225+	220+
<b>Allergen-Friendly Products</b>	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free	gluten-free, dairy-free, and nut-free
<b>Cost of Speciality Items</b>	Walmart has a wide range of affordable products.	Lidl has a reputation for offering affordable prices on products.	affordable prices on products.	Some speciality items may be more expensive.	Varies depending on the product and brand.	Depends on the products.	affordable prices on products. They provide with wholesale rates.

### Comparison

**On age and residents in each place**



In the United States, Whole Foods Market is a popular option, as it has a system of labelling that explicitly states whether a product includes common allergens like wheat, dairy, soy, and tree nuts, and provides a range of vegan, dairy-free, and gluten-free choices.

Trader Joe's is another American chain store with an impressive offering of allergen-free products that include nut-free and soy-free variants, among others, and a special section dedicated to gluten-free goods. Their products are effortlessly identifiable as they feature a system of labelling that shows which goods are free of common allergens.

Finally, under their private label brand Simply Balanced, Target offers a line of allergy-friendly foods that are free of typical allergens like wheat, dairy, soy, tree nuts, and peanuts, and a system of labelling to show which goods are free of these allergens.

## **CHAPTER:5**

### **Research Results:**

#### **Findings:**

All responses collected for the questionnaire were recorded and exported to a google spreadsheet. All the participants from the sample population were lactose intolerant (either self-diagnosed or clinically diagnosed). The method as described above was followed and the data were collected. The data showed that majority of the participants believed that there aren't sufficient substitutes available in the market for lactose intolerant individual's consumption.

## 2. Are you lactose intolerant?

127 responses

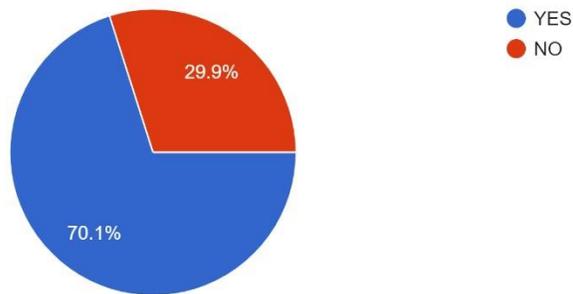


Figure 1

Among the sample population (89) we received, 72 participants expressed that they tried to find alternatives to lactose/diary products that cannot be consumed due to this condition.

## 3. Country of Residence

127 responses

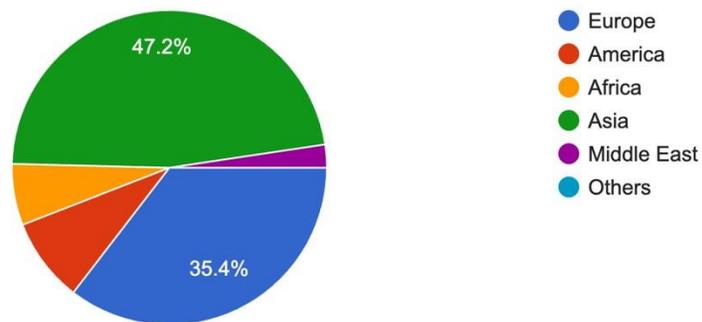


Figure 2

When asked the Country of residence to participants the major percentage of the sample population was from Asia at 42.7% with 60 respondents. The second highest was from Europe at 35.4% with

45 respondents followed by America in third at 8.7% with 11 respondents, Africa in fourth at 6.3% with 8 respondents and lowest was from Middle east at 2.4% with 3 respondents.

#### 4. Age of the participant.

94 responses

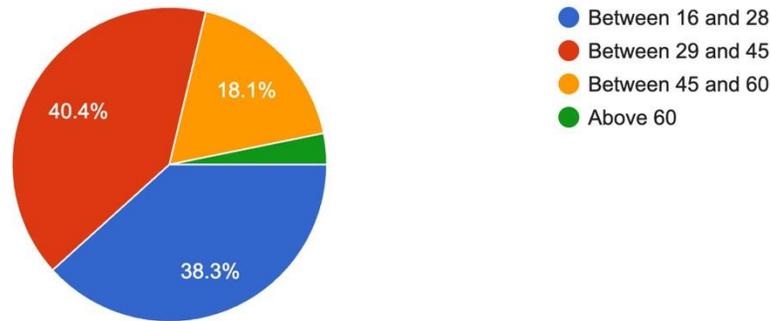


Figure 3

When asked the age of the sample population the majority of the respondents were at 40.4% between the age of 29 to 45 years. The second highest at 38.3% between the age of 16 to 28 years, followed by the third highest at 18.1% between the age of 45 to 60 years and least at 3.2% above the age 60.

#### 5. Do you avoid lactose products completely or try to find alternative to satisfy your cravings?

88 responses

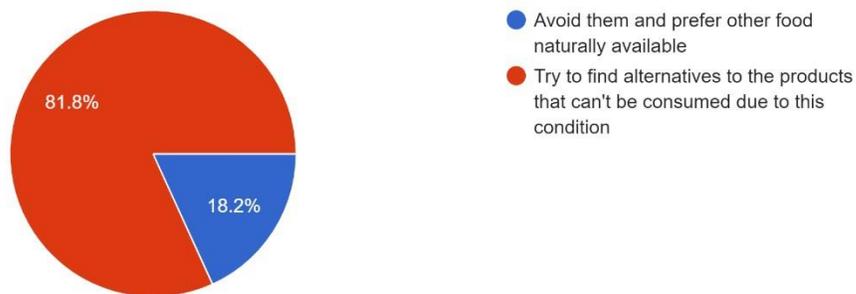


Figure 4

Of the 89 participants, 73 participants stated that despite there being a few lactose-free alternatives they find that there aren't sufficient options available in the market. Although we have 16 participants who have stated the opposite (that there are enough options available), they only constituted 17% of the total responses.

6. Do you think there are adequate substitutes in the market to lactose products?

88 responses

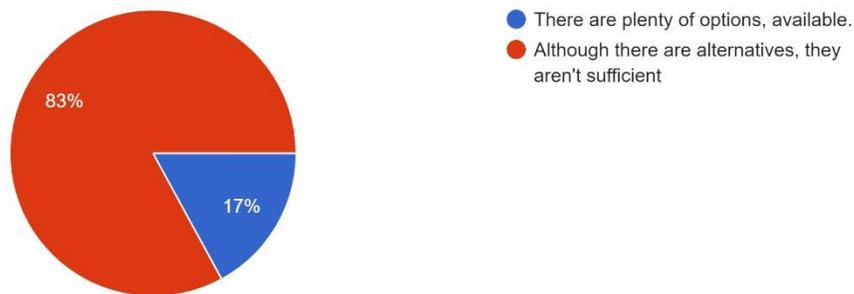


Figure 5

When asked if our lactose intolerant participants in their opinion, feel that they are missing out a lot because of this condition, the responses that we got were reassuring. We provided three options to the participants. 55 participants voted yes (that they are missing out a lot because of this condition). 17 participants voted no (that they do not miss anything much because of this condition). Finally, we had 17 responses for a maybe stand. In the three close ended questions of section 3, shows us that approximately between 81-83% of the sample population have mentioned that there require more options than what is available in the market today.

7. Would you say you are missing out a lot because of this condition.

88 responses

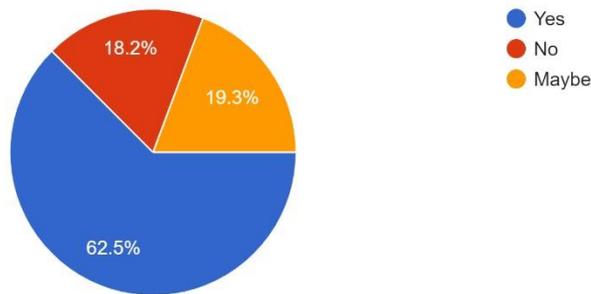


Figure 5

When asked about the opinion of lactose intolerance participants, we gathered responses that proved our hypothesis.

### **Qualitative analysis conclusion:**

After conducting a thorough qualitative analysis of the interview data at LIDL and DMart several key points were identified. The analysis revealed that most of the food allergic consumers interrogated whether the food products were lactose free or gluten free. Such type of food products is generally available in LIDL, and many customers request the LIDL sellers to import few products as per their requirement if its feasible. In LIDL a variety of allergic friendly food products are available, and it ensures that all those products labelling are done according to the Food and Drug Administration (FDA). Europe generally follows a mandatory information for prepacked foods and LIDL as well, such as the name of the food ,ingredient list (including any additives),allergen information, quantity of certain ingredients, date marking (best before / use by),country of origin, if required for consumer clarity (example: products that display on their packaging country flags or famous landmarks, name and address of the food business operator established in the EU or importer, net quantity, any special storage conditions and/or conditions of use, instructions for use if needed, alcohol level for beverages (>1.2%), nutrition declaration. According to the EU national law, food products must show specific warnings if in case the

products contain caffeine/any additional ingredient. Hence, the basic allergic friendly food products are always available at the store. The number of products might differ with the other normal products, but the basic needs of the allergic friendly customers are satisfied.

D-Mart is a prominent retail chain in India known for its successful business model and strong customer base. With its focus on providing value-for-money products and excellent customer service. DMart contains a vast variety of food products to the customer in a reasonable price. It also contains limited amount of allergic friendly food products such as gluten free, sugar free, lactose free etc., In India, consumers generally focus on products based on vegetarian and nonvegetarian ingredients used, they also chose wheat-based flours rather than all-purpose flour. DMart generally sold products in a large amount (wholesale), Hence the quantity of such products is huge and satisfies the consumer needs as per their requirements. The products availability may vary with respect to the normal food and the allergic friendly packages but, the required products and fast selling food packages are available more. The customer can also request the manager or send feedbacks if they require any food package with few neglected nutrients, it can be imported if its feasible and if the requirement is for a larger population. The labelling on the food products available at the store follows the FSSI, its ensured that the packaging includes the name of the product, the expiry and production date and if it's a allergic friendly food product the ingredients are highlighted.

## **CHAPTER-6**

### **Conclusion**

As per the research, each retailer on the list includes products that are appropriate to individuals experiencing allergic reactions, such as gluten-free, dairy-free, and nut-free options. The cost of allergic friendly items varies, however, depending on the market and the product/brand. While Spar and Shoprite could offer some particularization items that are more expensive, Walmart, Lidl, Lulu, DMart, and Carrefour are all known for having affordable prices on things.

Walmart & Lidl remain very comparable in terms of worldwide number of stores and market dominance. whereas Carrefour and DMart possess a lesser presence, certain parts of the country are well served by Lulu, Spar, and Shoprite.

Overall, it is obvious that consumer behaviour in all of these marketplaces is greatly impacted by food allergies. Customers suffering from food allergies prefer options that are clear concerning irritants, thus companies that offer these products might find an easier time attracting and retaining customers. nevertheless, continues to be scope for growth in terms of these products' cost and availability, particularly in emerging economies where access to specifically designed supplies may be limited.

Following the completion of both qualitative and quantitative research, we concluded that the market possessed an extensive variety of products. individuals" basic necessities are met, but when it comes to luxury items, allergic people are not satisfied. Owing to the scope of the market and the fact that most supermarket stores provide allergy-friendly products at reasonable prices. Many factors, including personal experiences, cultural norms, as well as understanding of the issue regarding food allergies, will probably have an effect on the manner in which allergen-friendly food products are viewed. It is likely that more individuals will come to understand the importance of supplying allergen-friendly items in the food market as awareness and comprehension of food allergies continue to rise.

The consumers opinions were similar in different parts of the continent, all of them were facing issues with labelling on the food products visibly in few brands and most likely the choice and taste of the food products were on a greater demand. The consumers purchased nuts free products ,but the variety based on nuts based products such as chocolates, ice-cream's, sweets where less available on regard to allergen free. Hence, such type of issues are yet to be resolved in the markets as per consumers concern.

The opinions of the consumers were identical throughout the continent, but they all experienced issues with the labelling of certain brands of food products. It is feasible that the choice and taste of the dietary products were in greater demand. The consumers purchased nut-free products, but they had less options for nut-based chocolates, ice creams, and sweets in the allergen-free category. As a consequence, markets are still looking for a remedy for these types of challenges that would fulfil consumers.

**Summary:**

This thesis investigates how consumer behaviour and food allergies are related. It looks into the effects that food allergies have on customers' product preferences, buying behaviour, and dietary habits. Examined in the study are the psychological, social, and cultural variables that affect the purchasing decisions of those who have food allergies.

The thesis emphasises the rising incidence of food allergies and their profound effects on the lives of consumers. It talks about the difficulties that people with food allergies experience, including the need to steer clear of allergenic foods, understand food labels, and control the danger of unintentional allergen exposure. The thesis also highlights the social isolation, worry, and other emotional and psychological effects of having food allergies.

The thesis analyses numerous elements that affect consumer behaviour in relation to food allergies through a thorough examination of the body of available references in internet and retail markets. The severity of the allergy, consumer awareness of food allergies, faith in food producers and labelling procedures, perceived risk and safety concerns, social pressures, and cultural norms are some of these factors.

The findings of this thesis have implications for food businesses, policymakers, and healthcare professionals. It emphasizes the need for accurate and transparent food labelling, educational campaigns to increase consumer awareness about food allergies, and the importance of social support networks for consumers with food allergies. The thesis also suggests potential avenues for future research in understanding the complex interplay between food allergies and consumer behaviour.

The issues experienced by consumers who have food allergies are highlighted in this thesis, along with the numerous factors that affect their choices of products, consumption habits, and purchase decisions. In conclusion, this thesis offers insights into the relationship between food allergy and consumer behaviour. The results of this thesis add to our understanding of how food allergies affect consumer behaviour and can guide market-based solutions for providing better services to customers with food allergies.

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