BUDAPEST BUSINESS SCHOOL
Faculty of Commerce, Hospitality and Tourism

Functional Food in a Healthy Diet

Supervisor:
Dalma Geréné Radványi, PhD
College associate professor

Written by:
Linetta Floransz Robalino Altamirano
Tourism and Catering
Commercial Hospitality

2025.

18 57
BUEB

Budapest University of Economics and Business
Faculty of Commerce, Hospitality and Tourism

Declaration of thesis authenticity

Student data							
Name, neptun-code	Linetta Floransz Robalino Altamirano	Y	B	R	Q	X	O

Thesis details	
Title of the dissertation	...Functional Food in a Healthy Diet..... .....
Name of supervisor	Dalma Geréné Radványi, PhD

I, the undersigned .....Linetta Floransz Robalino Altamirano..... hereby declare that the whole thesis submitted for assessment and defence is my own work. I entered the sources used in the bibliography and made the relevant formal references in the text. The thesis not submitted on my or anybody else's behalf to another course or institution. I am aware that any plagiarism (presentation of others' work as my own) will cause the thesis/project work to be invalid, therefore, rejected.

Date:...28. 04. 2025.....


.....
(signature)

Table of Contents

Introduction

According to the FAO definition from 2001, functional food refers to those that provide health benefits beyond essential nutrition, demonstrating specific health or medical benefits, including the prevention and treatment of disease. However, since 2001, there have been multiple discussions about the complexity of healthy dietary supplements, which influenced the concept of functional food. A healthy diet is composed of different elements of nutrition. In a balanced diet, individuals must consider which type of nutrient to consume and their effect on the human body. Functional food consumption can prevent chronic diseases such as cardiovascular diseases, diabetes, and cancer, as they typically contain high levels of bioactive compounds (FAO, 2001).

In hospitality, customers are becoming increasingly conscious about the food they consume; this trend shows growth in Hungary, too: 55% of the population consumes fruits and vegetables daily, and 19% of the population follows a special diet (KSH, 2019). The thesis aims to examine the proportion of this knowledge in Hungarian society, how much people know about functional foods and their benefits.

The thesis also investigates the benefits of using medicinal plants in gastronomy. The use of medicinal plants for human consumption has a long history worldwide. There are estimated to be 350,000 to 500,000 medicinal plant species (Salmerón-Manzano et al., 2020) from all vascular plants. Hungary is an excellent power of medicinal plants; in 2023 cultivation of medicinal and aromatic plants was going on 30 000 ha. there are approximately 130- 400 (Pászk, 2021) species of medicinal plants in Hungary that could be collected (NAK & GYSZT, 2023). In the research, some of those Hungarian medicinal plants will be introduced, which have the most potential for the hospitality business as a possible raw material, such as lavender, thyme, black elderberry, sage, mint, chamomile, sea buckthorn, dandelion, and rhubarb. In the past few years, the demand for medicinal plants has grown significantly, which is justified by the interest of scientists in the topic. After 2011, approximately 5000 publications on medicinal plants were published yearly (Salmerón- Manzano et al., 2020).

Medicinal plants have various beneficial effects on health, and they can be added to the processing of conventional food to create functional food. Their most common use is as a beverage, mainly in tea or syrup, but as the plants are consumable, they could be used for seasoning or raw material for dishes such as sauces, jams, and soups. The thesis will investigate the frequency of medicinal plant consumption and the industry's future from the hospitality point of view.

The dietary habits of Western culture are changing faster and faster nowadays. Younger generations (Millennials and Generation Z) are becoming more conscious about their health

and nutritional habits; they care about the effect of the food they consume on their health, following unique dietary habits not just to treat their diseases but to prevent them and increase

their general well-being. They realize that regular physical activity is not enough for health; they must also consider their dietary habits. This mindfulness influences their choices as customers of the hospitality industry as well. In everyday life, many working people don't have time to prepare their dishes at home; in many cases, those people eat at cantons or nearby restaurants; they are searching for places that provide meals with actual nutritional value for balanced nutrition. Hospitality businesses need to face the changing customer expectations from a special dietary point of view. As the number of followers of special diets is growing, it's not impossible to host a group of customers with different needs and expectations regarding the meal provided. However, the demand for restaurants prompting healthy lifestyle choices is growing; entrepreneurs are cautious about entering the market because of customers' skepticism regarding new technologies and products such as functional foods or exotic ingredients (Raffay, 2023). To overview the current situation in the market, the thesis analyses a survey based on the topic of restaurant choices in connection with health consciousness.

According to KSH data 2018, half of the Hungarian citizens reported having chronic diseases for over six months. According to Figure 1, the number of chronically ill citizens rises with age and a higher body mass index. The most frequent diseases in Hungarian society are high blood pressure, cardiovascular diseases, diseases of the locomotor system, allergies, and diabetes. Nutrition is key to preventing those diseases, especially in the case of diabetes and cardiovascular diseases.

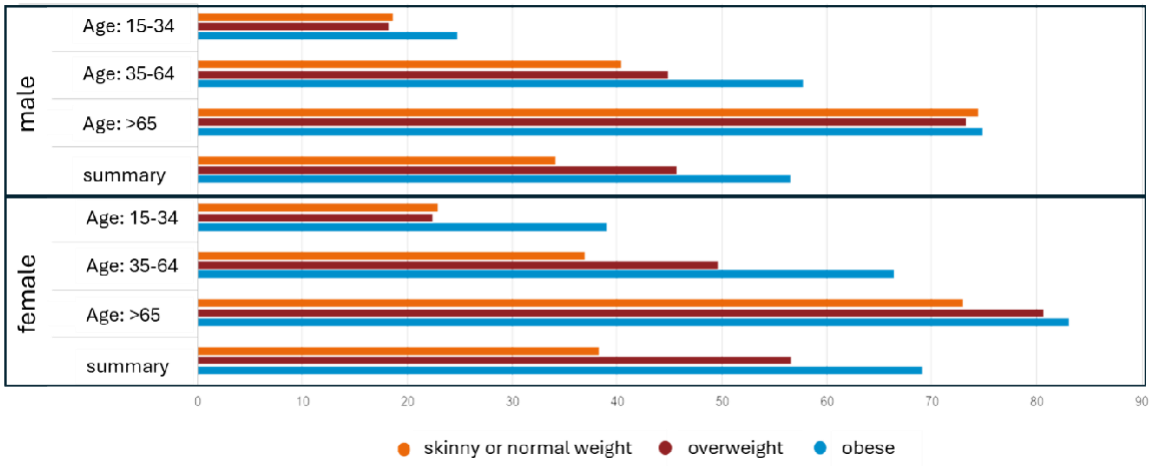

Figure 1 shows the ratio of chronically ill citizens by age and body mass index (BMI).

Source: KSH, 2019

According to Figure 2 (KSH, 2019), the leading reasons for mortality in Hungary are cardiovascular diseases and cancer. Both of these diseases are highly affected by nutrition and lifestyle.

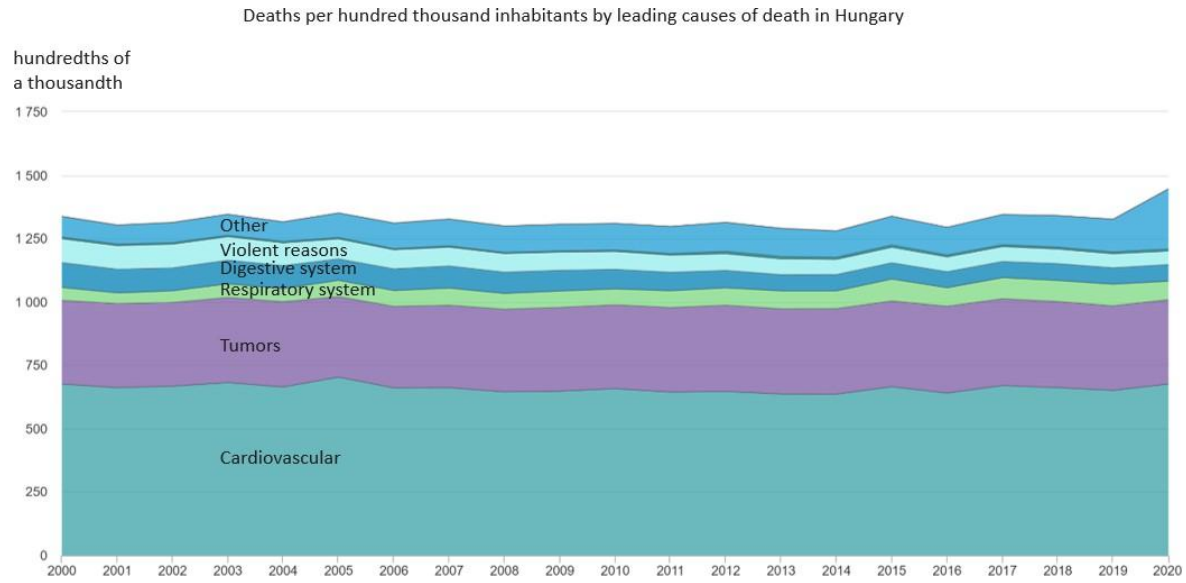

Figure 2 shows the leading reasons for mortality in Hungary from 2000 to 2020.

Source: KSH, 2019

However, 98% of Hungarians answered that they can improve their health. Moreover, every fifth person follows a special diet, resulting in the need for a new perspective in hospitality management to fulfil customers' changing demands.

Research questions:

- Which criteria need to be fulfilled to consider food as a functional food?
- How frequent is the consumption of functional food in Hungary?
- How do new dietary trends influence the hospitality industry?
- What kind of positive effect does the consumption of medicinal plants have?
- What are the possible culinary uses of medicinal plants?

This thesis examines the characteristics of functional food and its effect on the human body. The research aimed to investigate how much knowledge people have about functional food and its beneficial effects on general health, the immune system, and the prevention of diseases. The thesis also examines the influence of functional food in the hospitality industry as customers become more health conscious, and hospitality businesses need to fulfil more and more expectations of the customers, including special dietary needs (vegan, gluten-free, holistic, lactose-free).

The thesis examines medicinal plants' positive effects on health, their role in functional food, and the culinary experience they create in hospitality. It also examines how certain medicinal plants could be included in a healthy diet and a restaurant's menu.

The research for a better understanding and overview of the current scientific results and opportunities is based on basic empirical research on existing literature on functional food and medicinal plants.

A quantitative data analysis of a survey based on functional food and medicinal plants is aimed at investigating respondents' awareness and interest in the topic. The survey also examines the frequency of special diets, and which types of special diets are the most popular. In medicinal plants, a three-question multiple choice test provides information about the awareness of medicinal plants and their effect on health. The results are evaluated in terms of gender, age group, and educational level, which can give valuable insights into differences between social groups from the health consciousness point of view.

Interviewing a restaurant manager provides valuable information about the hospitality field concerning functional food and medicinal plants. Topics such as costs, customer expectations and changes in the past few years, seasonality, and sustainability will be covered. Results will be evaluated via primary data analysis.

2. Literature review

2.1. Functional food

2.1.1. Concept of Functional Food

Food can be considered functional food if it provides a health benefit beyond essential nutrition, demonstrating specific health or medical benefits, including the prevention and treatment of disease (FAO, 2001). With regular consumption of functional food, diseases could be prevented, and mental well-being could be improved. However, defining functional food is a difficult question, as there are many different categories in the field of food that will enhance health. We must differentiate between vitamins, functional food, superfoods, and dietary supplements. It's a controversial question regarding the law, which products can be labelled as functional food, and how not to deceive customers by false labelling. Labelling these products makes it more complicated because the requirements for health-improving food products vary between countries, making the cross-border market less transparent for customers and increasing the possibility of misleading product marketing. Another, more precise suggested definition of functional food states that "*Functional foods are novel foods that have been formulated so that they contain substances or live microorganisms that have a possible health-enhancing or disease-preventing value, and at a concentration that is both safe and sufficiently high to achieve the intended benefit. The added ingredients may include nutrients, dietary fiber, phytochemicals, other substances, or probiotics.*" (Temple, 2022). Functional food is emphasized by the added nutritional value from conventional, healthy foods and other categories in this concept. The Functional Food Center (FFC) and Dr. Martirosyan state that functional foods are "*Natural or processed foods that contain biologically active compounds which, in defined, effective, non-toxic amounts, provide a clinically proven and documented health benefit utilizing specific biomarkers for the prevention, management, or treatment of chronic/viral disease or its symptoms*" (Martirosyan et al., 2021, pp. 213-221). According to this definition, functional foods can prevent or treat viral diseases above chronic diseases.

In this thesis, functional food is researched based on Temple's and Martirosyan's definitions for a more efficient examination of different food products and trends in the market. According to FAO Codex Alimentarius, there are different functional classes based on their effect on food. One additive can belong to multiple functional classes as we differentiate 27 different functional classes. For example, Agar (or more commonly Agar-agar) is a carrier, emulsifier, and stabilizer as well. The most relevant functional classes from the research point of view are acidity regulators, antioxidants, carriers, colours, and sweeteners.

For conscious consumption of functional food consumers need to define first which components they need to take in higher amounts and then find those foods which are the best for their dietary needs. Numerous types of research have proven that food-bioactive so-called bioactive compounds such as alkaloids, polyphenols, flavonoids, terpenoids, carotenoids, peptides, and omega-3 are responsible for different food products' health-promoting and disease-preventing properties (Adefegha et al., 2022). Phenolic compounds are responsible for the appearance, flavour, and health-promoting properties such as antioxidant, anti-inflammatory, antitumor, and antimicrobial properties. Carotenoids are natural food colourings, they have antioxidants, and anti-mutagenic effects (Enri et al., 2024). There are several methods to produce functional food such as microencapsulation or fermentation.

2.1.2. Dietary Fibers

The most accepted definition of dietary fibers is that *"Dietary fiber is composed of plant cells resistant to hydrolysis, thus digestion by the alimentary enzymes of the human body"* (Dhingra et al., 2012, pp. 255-266). Dietary fibers are considered functional foods as they positively affect digestion and are resistant to enzymatic digestion (as cellulose, gums, and noncellulosic polysaccharides). The most common sources of dietary fibers are cereals, fruits, vegetables, and nuts. (Dhingra et al., 2011). There are two basic types of dietary fiber: soluble and insoluble. Cellulose, hemicellulose, and lignin can be found in the first category, pectins, gums, and mucilages are related to the second category as they form a gummy surface in reaction with water. Cereals are reported to be the primary source of dietary fiber as they contribute 50% of fiber intake in Western countries (Dhingra et al., 2011). Diets with high fiber content help to prevent several diseases as they reduce the time of intestinal transit, cholesterol, and glycaemic levels. There are several ways to use dietary fibers in functional food.

Raw material parts considered as food waste, such as oat hulls, peanut and almond skins, and waste portions of fruits, can be useful sources of dietary fibers if used in food applications. This methodology needs to be well considered by authorities and food producers because of the safety issues and the changes in the functional properties during the process but can be an effective way to reduce food waste and environmental risk. In the study of Vasileva et al., 2018, lavender and melissa (lemon balm) waste were added to bread for extension of shelf life and improvement of quality. Both lavender and melissa are medicinal plants, rich in dietary fibers and bioactive compounds. The study took place in Bulgaria, which is one of the biggest producers of lavender essential oil. In the process of essential oil production, an enormous amount of waste arises as both plants have relatively low (under 1%) essential oil content in one plant. The research results showed that by adding 5% of lavender and melissa

waste to the bread the dietary fibers increased three times and the polyphenols and flavonoids increased four times. Shelf life has also been increased to four days at room temperature with

no fungal or bacterial activity because of lavender and melissa's antimicrobial and antioxidant properties (Vasileva et al., 2018).

Citrus by-products from the food waste reuse point of view have great potential as the production of citrus-related final products, such as juices and oils, generates waste up to 15 million tons of by-product food waste yearly (Andrade et al., 2022). 15% of orange peel and pulp usage in biscuits can reduce fat content and add bioactive compounds such as flavonoids and carotenoids (Dhingra et al., 2011). The appropriate intake of these compounds can prevent degenerative diseases and cardiovascular diseases (Andrade et al., 2022). Data also revealed that orange peel and pulp increased the dietary fiber content of biscuits from 2,73% to 15,31% (Nassar et al., 2008). The research proved that by adding those "wastes" to bakery products such as biscuits, the favourable properties of citrus can be incorporated into the final product. It can be a great opportunity for hospitality businesses as well, especially with a menu including smoothies and juices, where high amounts of citrus food waste are generated, to reuse the leftovers locally for bakery products.

Mango peel is also a common agricultural waste product with high nutritional value and a respectable amount of bioactive compounds such as phenolic and carotenoid compounds that give antimicrobial, anti-inflammatory, and prebiotic properties (Vicensutto & de Castro, 2020). However, it has great potential as a source of dietary fiber and antioxidants. Researchers investigated the potential of mango peel-added macaroni; they found that by adding 5% of mango peel powder, the dietary fiber content can be increased more than two times while the phenolic and carotenoid levels also rise (Ajila et al., 2010). The quality of the product has not shown changes during the cooking which justifies the opportunity to create pasta, which is a widely accepted element of the human diet, with better nutritional value and reduced food waste at the same time. Outside of bakery products, plant-based food waste can be used in the fermentation process of dairy products.

2.1.3. Kefir

According to the FAO and WHO, kefir is a type of fermented milk product with a starter culture prepared from kefir grains consisting of a mixture of lactic acid bacteria and yeast (FAO and WHO, 2003). Kefir is a suitable product for the functional food category. It is considered a functional beverage, as it contains every favourable nutrient of milk and possesses the properties of the added kefir culture. The lactic acid bacteria species positively affect the overall gut health and immune system and have cholesterol-lowering properties. The yeast in the kefir culture also improves digestion and has an antimicrobial effect. As kefir can be produced from various types of milk, even soy milk, by changing the fermentation method, a product could be

created that is available and attractive for vegans, lactose intolerants, and people following a non-dairy diet as well (Birwal et al., 2025).

There are various options for adding ingredients with functional properties to kefir, such as plant extracts, fruit juices, or essential oils (Soutelino et al., 2024). One of these plants is lemongrass, known as a medicinal plant because of its anti-inflammatory, antimicrobial, and digestive-enhancing effects. Moreover, it is a great source of essential oils, flavonoids, vitamins, and minerals (Birwal et al., 2025). The comparative research by Vicensutto & de Castro proved that kefir samples with mango peel powder had a higher content of lactic acid bacteria and improved antioxidant properties. Using mango peels in kefir production can also contribute to the environment. The food waste generated during the processing of mangoes, consisting mostly of peels and seeds, causes an environmental hazard in Brazil. Mango is the most cultivated fruit in Brazil according to FAOSTAT data 2,3 million tons were produced in 2023. During the processing of mangoes, approximately 20% of waste is generated from the whole fruit (Puligundla et al., 2014).

Fermentation with lactic acid bacteria has great potential to enhance the functional properties of plants as fermentation can lead to significant changes in health-promoting features of plant foods. Filannino et al., (2018) described the process as a plant labyrinth where lactic acid bacteria follow different pathways during plant fermentation resulting in the release of different bioactive compounds and the removal of antinutrients. To undertake the path successfully starter cultures should have a dedicated portfolio of enzymes. Further research may focus on which compositions have the greatest potential as the demand for plant-based food is growing constantly (Filannino et al., 2018).

2.1.4. Açaí

Açaí is gaining more and more attention as it has multiple beneficial effects on health. It’s recognized as a superfood as well. The palm species is native to the South American Amazonian Forest, where indigenous communities have been consuming the tree's fruit for centuries for nutritional and medical purposes as well (Rodríguez-Cortina & Hernández-Carrión, 2025). In 2023, according to IBGE, (Instituto Brasileiro de Geografia e Estatística) Brazil produced 1.696.485 tons of açaí, which made them the biggest producer of açai, supplying almost the entire demand for açaí. Due to açaí’s high bioactive compounds, it can be used as an addition to create functional food, highlighting the most beneficial effects of acai. The most common usage is adding to yogurt, ice cream, and drinks (Teixeira da Silveira et al., 2023). The popularity of acai may have risen because these forms of consumption make it easier for customers to overcome the fear of unknown, exotic ingredients, as they already know the base product from their regular dietary habits.

From the perspective of macronutrients in açaí the researchers show that the value of

carbohydrates is the highest, except in one sample, where lipids were found in the highest amount. Açaí is a rich potassium, phosphorus, calcium, and magnesium source. The proportion

of minerals was significantly higher in açaí juice than in the lyophilized dietary supplement, and the levels of potassium and phosphorus were reduced by approximately 50%. (Teixeira da Silveira et al., 2023). These results make the usage of açaí as a functional food addition more relevant and beneficial for health than as a dietary supplement. However, the seeds of açaí show a higher content of calcium and potassium than the pulp, which makes the açaí flour a potential addition to functional food products as from 100 g of seeds an adult could cover the daily intake of these two minerals equally 175 mg calcium and 700 mg of potassium (Teixeira da Silveira et al., 2023).

Açaí's properties as a functional food are proven in the research of Bonadio Bellucci et al. about açaí extract powder in pork patties as an antioxidant. The research proves that açaí can replace sodium erythorbate in preserving frozen pork patties as it improves the antioxidant status (Bellucci et al., 2022). The study is based on the changing customer expectations regarding the food industry as they search for products with natural additives such as açaí. This result also supports the opportunity for shifting to natural preservatives and additives in food products instead of chemical ones, as the earlier-mentioned bread with lavender and melissa waste showed.

2.1.5. Walnut

Walnuts can also be considered a functional food due to their rich nutritional profile and bioactive compounds (plant proteins, essential amino acids, omega-3 fatty acids, phenols, vitamins, and minerals). It is the most essential nut for human nutrition, and it plays an important role in the Mediterranean diet due to its high nutritional value and traditional consumption (Sharma et al., 2024). It contains 15.2g of protein and 13.7g of carbohydrates (FAOSTAT, 2016). Even in ancient times, it was used for medical purposes as it contains polyphenolic compounds, tannins, and alkaloids, and in dietary almost every part of the tree is usable.

It offers various health benefits such as anti-inflammatory, antioxidant, anti-tumor, and cardioprotective effects. It also contains prebiotics that can positively influence the gut microbiome, enhancing the growth of beneficial bacteria. Walnut oil contains antioxidants and lowers cholesterol (Sharma et al., 2024). Walnuts have various ways and forms that can appear in a balanced diet and healthy meals: they can be consumed raw, in bakery products, and in salads too. In recent years, oatmeals for breakfast have become increasingly popular; walnuts can be added to oatmeals to improve taste, texture, and health.

2.2. Medicinal Plants

2.2.1. Concept of Medicinal Plants

Medicinal plants have been used for centuries to cure various illnesses and improve general health in various cultures. Medicines in modern cultures are commonly used but they certainly have side effects (Sharma & Rana, 2024). Those potential side effects might grow the interest in natural medicines such as medical herbs in society. Alternative medical approaches such as Ayurveda have also grown in interest in the past few years. Ayurveda is a traditional Indian medical system that dates to the Vedic period, approximately 5000 years ago (Beulah & Umanandhini, 2024). Ethnobotany is a multidisciplinary science studying the traditional use of plants. Ethnobotany is believed to have contributed to the development of modern medicines by 30%. However, it has become important again in recent years because of the growing demand for natural medicines (Bhattari & Karki, 2004).

To understand the concept of medicinal plants, the introduction of phytotherapy's definition is the first step. Phytotherapy is the medical use of plants and related products such as herbs, medicinal plants, apiary products, and aromatic plants, to prevent diseases and for health prevention. Phytotherapy consists of traditional folk medicinal approaches and modern medicinal plant usage (Pászk, 2021). The use of plants for medical purposes has a long history. Prehistoric man used plants to treat their diseases, and this practice was introduced in the animal world as well through the example of *Dactylis glomerata* L., which is consumed by dogs and cats when they have digestion problems (Ihász, 2018).

Educating society about the effects of medicinal plants is key to growing trust in non-pharmaceutical medical products. Although the interest in herbal medicinal products and phytotherapy is growing, the education of patients and medical students is insufficient. A study by Krenn & Burkart surveyed 150 medical students from three regions of Europe. Results showed that approximately 70% of the participants had at least some knowledge about the topic. Surveys also showed that in the East region, most of the knowledge was gathered from social media (Krenn & Burkart, 2024). From that result, we can assume that students are interested in the topic but cannot get the information from a trusted source such as lectures. Several studies showed that complementary and alternative medicine education is missing from the curriculum in most European medical schools. For example, in Germany, at most, 2 to 3 hours of the entire curriculum explored the topic (Erfurth, 2018).

2.2.2. Spirulina

Spirulina is a blue-green microalga found in warm aquatic environments in tropical/ subtropical regions (Sharma & Rana, 2024). According to FAO, 2008 spirulina has a high

protein content, approximately 55-70 % of dry weight, and contains essential fatty acids such as linoleic acid, vitamins, and minerals (FAO, 2008). Spirulina is considered a superfood

because of its biochemical properties, due to its cell wall lacking cellulose, making it easy to digest or process. Spirulina is marketed in several forms, such as capsules, chocolate, pasta, and biscuits (Sharma & Rana, 2024). It is the perfect example of how an exotic ingredient with valuable nutrients can be marketed and incorporated into numerous well-known products to enhance customer recognition. Spirulina can also replace emulsifiers and stabilizers in ice cream according to its high amounts of phycocyanin without influencing the overall acceptability of customers (Rodrigues et al., 2020). However, in some cases, the unfavourable sensory properties of the alga need to be hidden to produce the same product from the customer's point of view with the added nutritional value. The technology for that is the so- called nanoencapsulation. In 2024 research chocolate milk was enriched with spirulina through the nanoencapsulation technique. Nanoencapsulation was presented by developing nanospheres with Spirulina through an electrospraying technique (Rasia et al., 2024). Chocolate milk has various health-promoting properties as it contains casein, calcium, and vitamins. It is a popular drink in school canteens for young children because it promotes muscle and bone recovery (Givens, 2020). Research by Rasia et al. states that consumer acceptance is dependent mostly on colour and taste characteristics. From three samples that were presented to judges, the purchasing intention for the regular (control) chocolate milk and chocolate milk nanospheres containing Spirulina hasn't shown significant differences. The acceptability index was only 7% higher for regular chocolate milk than for chocolate milk nanospheres containing Spirulina. However, the acceptance index of chocolate milk with Spirulina biomass was 18,1% lower than regular chocolate milk (Rasia et al., 2024). Nanoencapsulation is a great opportunity for the food industry to develop functional food with higher purchasing intention and overall customer acceptance via hiding unfavourable sensory properties such as unusual colour, smell, or texture.

2.2.3. Lavender

Hungary is a great power of medicinal plants. In 2023, cultivation of medicinal and aromatic plants was going on 30,000 ha. There are approximately 130- 400 species of medicinal plants in Hungary that could be collected (Pászk, 2021, NAK & GYSZT, 2023). However, the industry has not sufficiently improved, and the growing demand for Hungarian medicinal plants has not been fulfilled yet. Culturing medicinal plants has various beneficial effects on the economy from both the tourism and catering side and the production of related cosmetic and food products. According to the Kiss and Boldog, 2021 report in Hungary, most of the medicinal plants are collected. The most important species from this category are camomile, elderberry, nettle, milfoil, linden flower, and rosehip. From those in 2020, camomile and elderberry were marketed in the largest quantities (Kiss and Boldog, 2021). The opportunities

in the industry can be examined through the industry around lavender, which is one of the most popular and well-known medicinal plants (Smith et al., 2024).

There have been numerous studies on lavender's beneficial effects, such as reducing stress levels and anxiety and helping with sleep. The plant is frequently applied as an essential oil in aromatherapy. Lavender has proven to have anti-inflammatory, antioxidant, and antimicrobial properties. The antimicrobial property of lavender is due to its high content of linalool and linalyl acetate (Kajjari et al, 2022). Linalool is a type of alcohol found in more than 200 plant species, such as Cinnamon and Coriandrum. Although it can be used in cosmetic products and the food industry as well for seasoning and natural purple colouring.

Culturing lavender and using related products in Hungary dates back to the 1920s when Gyula Bittera acclimated the first lavender plant originating in France (Rózsa, 2023). In Hungary, the center of lavender cultivation is Tihany. The city is located on the bay of Lake Balaton building its tourism and cultural heritage around lavender cultivation. They organize thematic walks on lavender fields and numerous shops selling locally produced lavender products to boost local commerce. The tourism industry is also supported by the pulling factor of lavender with programs such as the Lavender Festival and Lavender House (Tihany Településfejlesztési Koncepció, 2013). The concept of Lavender House lets visitors educate themselves about lavender.

2.2.4. Elderberry

Elderberry has great potential to be considered a functional food alongside the medicinal plant category. The demand for berries has increased since the interest in health-conscious nutrition has been growing for the past few years. Berries are small fruits with different colours and aromas containing high amounts of phytochemicals and vitamins. Berry fruits are accessible globally and have numerous species, such as Açaí in the Amazonian region and Elderberry in Europe and North- America. Elderberry and related products gained attention after the flu seasons in 2017-2018 and the COVID-19 pandemic as it has been used for flu and cold treatment in traditional medical approaches. Elderberry has various favourable effects on health, such as anti-inflammatory, antioxidant, antidiabetic, and neuroprotective properties It is a great source of Vitamin C and A, iron, and potassium (Terzić et al., 2022). As elderberry was successfully marketed as a dietary supplement, it started to appear in the functional food and beverage market in flavoured drinks and snack bars. According to a US market report of herbal supplements, 2023 elderberry was the second top-selling herbal supplement with $176,953,924 in total sales in mainstream channels (Smith et al., 2024). To seize the opportunity of elderberry, there has been numerous research on potential food products related to elderberry that could be

marketed as functional food, such as wines and fermented juices.

Consumption of berry wines is associated with numerous health-beneficial effects such as the prevention of cardiovascular and gastrointestinal diseases (Maksimovic & Maksimovic, 2017). Certain types of berry wines (strawberry, raspberry, blackberry) are more common and accessible to consumers. Elderberry wines are less commercialized yet. The main reason behind that phenomenon might be the production process that requires special attention. Unripe elderberry fruits contain cyanogenic glycosides in their phytochemical composition that release toxic hydrogen cyanide under heat treatment of the wine-making process. However, the cyanogenic glycoside content of ripe berries is significantly smaller. The process requires special awareness to preserve the product's safety (Terzić et al., 2022).

2.2.5. Chamomile

Chamomile is one of the most popular medicinal plants in Hungary, also very well-known globally due to its numerous beneficial effects, such as anti-inflammatory, antioxidant, and sedative properties. The most popular forms of chamomile are essential oil (mainly used in cosmetology) and tea (Srivastava et al., 2010). Similarly to lavender and lemongrass, during the processing of chamomile, large amounts of waste are produced, both flower powder and distillation by-products. Chamomile is an excellent option for functional food additives due to its significant content of terpenoids (Drača et al., 2025). Terpenoids are known for their antidiabetic, antioxidant, and anti-inflammatory properties (Adefegha et al., 2022).

2.4.6. Dandelion

Enri et al. researched wild leafy vegetables in the Alps and their potential as functional foods. The Alp region has a long history of consuming wild leafy vegetables, as the environment (mountains, hills, forests) is less suitable for agricultural activity than wild food collection. Including wild leafy vegetables in a diet has numerous advantages. Due to their caloric contribution, they are suitable for low-calorie diets. In addition, they are great sources of nutrients and phytochemicals (Enri et al., 2024).

2.3. Overview of Hospitality and Tourism

Tourism and hospitality are globally significant but constantly changing and renewing sectors. The industry's greatest challenge is adapting to changing customer expectations and behaviours (Sarmento & Loureiro, 2018). In the past few years, the overall awareness of society has grown in the field of nutrition. Health is one of the greatest tourism trends, with ambivalent factors such as new technologies and connecting with nature, seeking traditional knowledge

and treatments (Törőcsik & Csapó, 2018). The growing demand for health and nutrition from the marketing and hospitality point of view is caused by the change in the way society thinks

about health: the focus is on healthy people's “treatment” and prevention of diseases. As health is becoming more important for people, other segments, such as the food industry, tourism, and wellness, are also developing a stronger relation to health (Törőcsik, 2016).

Research has shown that this trend affects the hospitality industry as well, customers’ decision-making is getting more and more influenced by the nutritional value of the restaurant's meals (Raffay, 2023). According to Sarmento & Loureiro's study, the four main tendencies on the market are social media, Asian influence and strong flavours, social responsibility and sustainability, and health. Customers seemed to highly appreciate the custom dining options for health, which is an effective way to reach customers with different dietary needs. The demand for locally sourced, organic ingredients has also shown growth from a sustainability point of view (Sarmento & Loureiro, 2018). Including wild food and medicinal herbs on restaurant menus could be a great opportunity to serve the earlier mentioned shifting demand.

2.3.1. Wild Food

Wild food collection is a traditional activity with multiple opportunities for the future from the tourism and catering point of view. It is estimated that 14% of EU citizens collect wild food occasionally. However, the frequency of wild food consumption and collection varies between EU countries concerning the fraction of forest land, the importance of wild food in cuisine, and the regulatory system of hunting and access to forests and nature. Wild food consumption in many European countries is part of the traditional cuisine and cultural heritage. However, in industrialized societies in recent years, wild food consumption has shown a decline as the nutrition of these societies is more reliant on agricultural products, and only elderly people preserve the knowledge of wild food collection. Educating younger generations on the topic is key for safeguarding wild food collection and maintaining safety issues, as not every wild plant is edible. Furthermore, some of them are toxic. Besides the food industry, wild food collection provides recreational purposes as well. Hunters travel to other countries or areas at certain times of the year for hunting trips, and day trips to nature for mushroom and plant collection are organized in some countries (Sweden) (Schulp et al., 2014).

2.3.2. Marketing Strategy

However, the demand for restaurants prompting healthy lifestyle choices is growing, and entrepreneurs are cautious about entering the market because of customers' skepticism regarding new technologies and products such as functional foods or exotic ingredients (Raffay, 2023). According to Szakály et al., we can differentiate four strategies based on internal and

external factors in food innovation that have different outcomes for the producer. Marketing strategies based on the scientific success of the product without demand from consumers

typically have a high risk, as the market is not yet ready for the new product. The example of selenium and vitamin E added to eggs proves that even if the product had health-beneficial properties, consumers' lack of knowledge on the topic built scepticism about the product (Szakály et al., 2014). The success of elderberry, the second-best-selling herbal product in the US in 2023, showed an example of whether there is synergy between consumers, marketers, and scientists in the case of food innovation.

Marketing strategies in the field of functional food need to educate consumers about the beneficial effects of functional food to build trust in food innovation and attract them. Another factor from the marketing point of view is that functional foods are enriched food products, however, consumers seemed to reject enriched food even if they were enriched with vitamins or bioactive compounds. In the example of eggs, the "Wellness" mark made the product more attractive to consumers (Szakály et al., 2014). The research showed that the communication of the new product influences the success in high proportion. Labelling and education are key to attracting consumers. In the field of hospitality menu composition and providing detailed information about the food products could help to educate consumers and support the decision-making process.

2.3.3. Hungarian scope

In Hungary, according to MTÜ (Magyar Turisztikai Ügynökség- Hungarian Tourism Agency), there are significant differences between the capital Budapest and the countryside in the field of hospitality. The global trends in hospitality have a greater influence on Budapest than the countryside such as international and niche cuisine. From the special dietary category only vegetarian spread throughout the country, vegan, gluten- or lactose-free options are highly limited in the countryside (MTÜ, 2017). Tourism and hospitality development in the Hungarian countryside is an important part of the Turizmus 2.0 development strategy. The Mátra-Bükk and Sopron-Fertő regions have the greatest potential for recreational and health purposes. The Mátra-Bükk region is rich in organic food suppliers and wild food from the surrounding forests, and the Sopron-Fertő region has a great tradition of medical tourism. Also, the high proportion of tourists influences the bio and sustainable aspirations in the region (MTÜ, 2017). Wild plants could be an untapped segment of Hungarian gastrotourism and cultural heritage. The interest in wild plants with health-beneficial properties has been growing since the millennium. Since 2014, wild plants in gastronomy have been considered a trend in hospitality (Dénes, 2018). The potential in wild plant gastronomy is high as the development doesn't require technological development or investment as the methods are traditional and the sources are available. A well-established marketing strategy could improve the attraction of these products. Food festivals

are great opportunities to improve the knowledge of tourists and locals both on food products and contribute to the local economy. The first shallot festival was organized ten years ago. The

popularity of shallots has grown significantly since the festival; nowadays, bakeries, restaurant menus, and supermarkets sell shallots in various forms (Dénes, 2018).

2.3.4. Wine

Hungarian gastronomy and gastrotourism are highly dependent on wine. Numerous wine regions provide exceptional beverages, and wine-making has a long tradition in Hungary. Wines are rich in phenolic compounds essential in preventing cardiovascular diseases. A new trend in the wine industry is the orange wine, also called skin-contact white wine. The second label defines the technology behind the product: the wine is fermented on the orange skin to produce a new, unique product rich in phenolic compounds. The production of orange wine combines the technology of red and white wine-making. Orange wine is fermented on the skin of an orange from white wine. The aim is to untie phenolic compounds from the fruit that provides a unique aroma and colour to the wine. The method originates from Georgia but has spread in the last decade as the demand for organic, healthy wines has grown (Bene, 2018). According to Bene et al., orange wines have a potential segment in Hungary, mainly those consumers who are the target market who seek innovative, premium, unique wines. Bio and organic labelling could also contribute to successfully marketing orange wines (Bene et al., 2018). Organic labelling has a much more elaborate regulatory system than functional food, as the EU regulation states "*Organic production is an overall system of farm management and food production that combines best environmental and climate action practices, a high level of biodiversity, the preservation of natural resources and the application of high animal welfare standards and high production standards in line with the demand of a growing number of consumers for products produced using natural substances and processes. Organic production thus plays a dual societal role, where, on the one hand, it provides for a specific market responding to consumer demand for organic products and, on the other hand, it delivers publicly available goods that contribute to the protection of the environment and animal welfare, as well as to rural development*".To enhance interest in new, innovative products, food-drink pairing recommendations and degustation menus have great potential from the hospitality point of view.

3. Materials and measures

3.1. Interview materials and measures

The research applied both qualitative and quantitative methods. For the qualitative research method, a professional interview was arranged with Tibor Répási, Director of Hotel Szarvaskút Wellness és Konferencia, and Kemencés Étterem, also the restaurant's manager. The interview was conducted through Microsoft Teams to have the same experience as a live interview for both participants. However, as the restaurant is located in the countryside, in Veszprém county, the online interview was a more comfortable option for both parties. The interview questions were designed to cover the subtopics of the research, such as functional food, special dietary needs, medicinal plants, and sustainability, alongside personal experiences and the managerial scope.

The first part of the interview concentrated on functional food and the restaurant's characteristics. The first question was if the interviewee had heard about functional food and asked to give some examples. The second question aimed to position the restaurant. The interviewee was asked about the clientele profile, the best-selling meals, and if they sensed any changes in customers' demand for healthier meals in the last 5-10 years. Concerning that question, special dietary needs were covered by asking if they provide vegetarian, vegan, gluten- or lactose-free meals. For the future plans of the restaurant, the next question was whether they plan to extend the menu with functional food-based meals or more menu items that fulfil special dietary needs.

The second part of the interview focused on medicinal plants. The first question in the second part was about the frequency of medicinal plant usage in the restaurant and menu planning. Concerning that question, seasonality's role in the planning was also important, as well as how frequently they change the menu and which seasonal raw materials are used most. Regarding sustainability, the last topic of the interview was supply chain management and internal activities for food waste reduction.

3.2. Survey materials and measures

For qualitative methods, a survey was arranged to explore the market (https://forms.gle/tZ8KPe8MyZpezHMC7). The survey included research topics such as functional food, medicinal plants, and special dietary habits from the customer's perspective. The questionnaire included multiple-choice questions in the highest numbers, some of which accepted multiple answers. In some cases, respondents had the chance to add answer options to

explore the topic better. The last three questions of the questionnaire were designed as a quiz to collect relevant information on the respondents' knowledge of medicinal plants. Data

collection did not include personal data such as name or contact information. The questionnaire only collected data based on respondents' age, gender, and educational level. The core aim of the questionnaire is to obtain information on respondents' knowledge of the topic and their open-mindedness to new ingredients and changes in dietary habits.

The first question aimed to obtain an understanding of functional food, whether respondents have already heard about functional food, and whether they are interested in the topic. Respondents chose from 4 answer options, which were designed to measure answers on a scale from those who have already heard about them and found it interesting to those who have never heard about them and are not interested. The second question asked about respondents' dietary habits and whether they consciously consume healthy food. Respondents chose from three answer options: yes; no, but I wanted to; and no, and I did not want to. If they answered yes, respondents were asked to write down which healthy food products they consumed consciously. Concerning the last two questions, respondents were asked how frequently they consume consciously healthy food, if they do. Respondents had four answer options, ranging from daily to occasionally. The last question for exploring the dietary habits of respondents was whether they follow a special diet. Respondents had three answer options: yes, no, and temporarily. Concerning this question, respondents were asked to choose which special diets they were following. The topic of dietary habits is an essential part of the research, as well as the estimation of interest in the topic of functional food, to obtain the demand for restaurants with this profile. The last question in the first part of the questionnaire was whether respondents' restaurant choices are influenced by the health-beneficial effects of the food they provide.

The second part of the questionnaire was based on medicinal plants. The first question was structured the same as the first part: whether respondents have already heard about medicinal plants' usage for cooking purposes. Respondents had four answer options on a scale: yes, I heard about it and used them, to no, I haven't heard about it, and I'm not interested in the topic. The next question asked respondents to choose those medicinal plants they are more likely to consume in foods and beverages. Respondents were asked to complete a three-question quiz in the last part of the questionnaire. The first question was about the inflammatory effect of medicinal plants. Respondents chose which one they think has this health-beneficial effect from the list, but respondents also had the chance to add their own choice. The following two questions about medicinal plants' blood pressure-reducing and digestion-enhancing effects were designed as the first one. In the quiz part, respondents could choose multiple answers as medicinal plants generally have more than one health-beneficial effect. The aim of this part is

also to obtain the knowledge of respondents on the topic by testing them to receive a more realistic scope for that question. The list of medicinal plants consisted of the same medicinal

plants: mint, lavender, sea buckthorn, thyme, sage, chamomile, rhubarb, anise, dandelion, and petite. For the list, those medicinal plants were chosen that are presented in the thesis and have the health-beneficial effects that the question asks for.

4. Results

4.1. Professional interview

For a better understanding of the managerial scope experience, an interview was conducted with Tibor Répási, Director of Hotel Szarvaskút Wellness és Konferencia, and Kemencés Étterem. During the interview, topics such as personal experiences, guest expectations, menu composition, and sustainability were covered. Tibor himself has a conscious diet composed of various natural sources of minerals, fibers, and trace elements. He is familiar with the definition of functional food. For example, he regularly chooses vegetable ragu, goji seeds, almonds, and avocado instead of "pills" to maintain a healthy daily intake of vitamins. Hotel Szarvaskút is situated in the countryside of the Bakony Mountains, an area renowned for its outstanding wildlife. The location of the hotel and restaurant influences the distribution of guests. According to Tibor, most guests are Hungarian, comprising approximately 98-99% of the total, which is a very high proportion, and some of them are returning guests. The restaurant takes orders from its à la carte menu, but the highest volume of consumption is generated by buffet catering. Tibor explained that educating guests about conscious alimentation is more challenging with buffet catering, as guests make their choices based on what they see. They offer options for guests with special dietary needs, such as vegetarian, gluten-free, or lactose-free diets, in response to the growing demand for these types of options. The survey, which focused on the topic, also reinforced this trend. Tibor also mentioned that from a managerial point of view, as the prices are higher for special ingredients, filling the buffet with those is challenging.

To understand the current experiences of managers, the next question was about changes in customer demand, if any. Tibor's answer was surprising, as he said that they had not sensed much change in their customers' favourites, as most of them still choose greasy, Hungarian cuisine-based dishes, such as fried meats, pork knuckle, and stew. The other great challenge of making healthier dishes in a restaurant like Szarkvaskút Kemencés and BBQ Restaurant is that the recipes for those meals include a lot of fat; they can not be served dry. However, they have healthier options such as grilled vegetables with brewer's yeast flakes, which is a great option for vegans and health-conscious guests, but according to Tibor, guests do not choose that as often as traditional meat meals. This phenomenon might be caused by multiple factors, such as Hungarian traditional food, location, and the restaurant's profile. However, they are dedicated to reaching every potential guest by including vegetarian or vegan options in the starter, soup, main course, and dessert. The list of allergens is also available for guests following a special diet, as required by law.

However, Tibor explained that there have been multiple attempts to expand the menu with healthier, functional foods. To introduce new ingredients and dishes to guests, they utilize a seasonal menu that is updated approximately every two to three months, incorporating new offers according to the season. Usually, they provide a winter and summer offer which ones are not related to a specific raw material. For spring and autumn, the seasonal offers are more related to one specific raw material such as shallots, asparagus, mushrooms, and pumpkin. They monitor which items are the best sellers from the seasonal offer, and sometimes they incorporate those into the buffet. However, the ones that are not popular enough are excluded due to cost efficiency. For example, shallots are a recurring item in the seasonal offer year to year at springtime. Shallot is a great raw material for creating more exciting seasonal dishes due to its unique flavor. It can be added to pastries or used as a raw ingredient in soups or creams. As Tibor said, the shallot pesto from earlier seasonal offerings stuck with the audience as much as they incorporated that into the buffet. In the latest shallot seasonal offer, they featured shallots in a burger, cream soup, risotto, and fish dishes. This menu composition, featuring various traditional dishes such as fish, burgers, and risotto, suggests that in a seasonal menu, reaching every customer is the key to introducing a new raw material. Another interesting aspect of the shallot menu is that the shallot cream soup is made with plant-based cream; thus, they have one vegan item on the menu, which is also a great step in reaching a wider audience. As we covered the topic of shallots, we continued to discuss the raw materials that are easily accessible, depending on the location of the restaurant. Mushrooms also play a significant role in the seasonal menu as they are available in the surrounding forest area. There are multiple types of mushrooms available for collection, including parasol mushrooms, boletes, and cep mushrooms. However, Tibor, an expert in the mushroom collection, complained about the accessibility of the mushrooms, as they are highly dependent on the weather. Sometimes, entire seasons are lost if the weather is dry or cold, hindering mushroom growth. As Tibor noted, seasonality plays a crucial role in restaurant menu planning.

4.2. Questioner results

A survey on functional food and medicinal plants was conducted to explore the current market situation from the customers' point of view. The control group was adults between 18 and 65 years of age. The demographic data for respondents' residence or income level was irrelevant for the research. These questions were not included in the surveys. The irrelevance is based on the research question of whether there is an interest in functional food and new raw materials in hospitality. As Figure 3 shows, most respondents, 76 %, are 18-25, with the highest educational attainment being a high school diploma, as 56 % of respondents chose that answer.

An additional 6% of respondents have a secondary technical school certificate, which in

Hungary belongs to the same (secondary) level of education as a high school diploma according to Figure 4. 64 % of the respondents were women, and 32% were men.

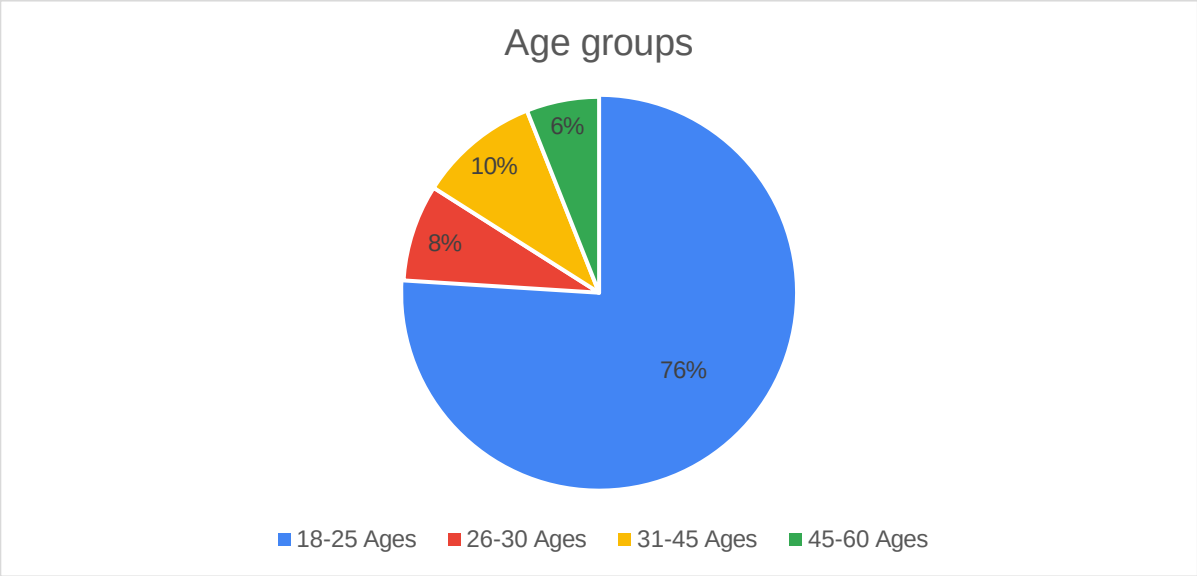

Figure 3. Shows the distribution of respondents' age groups.

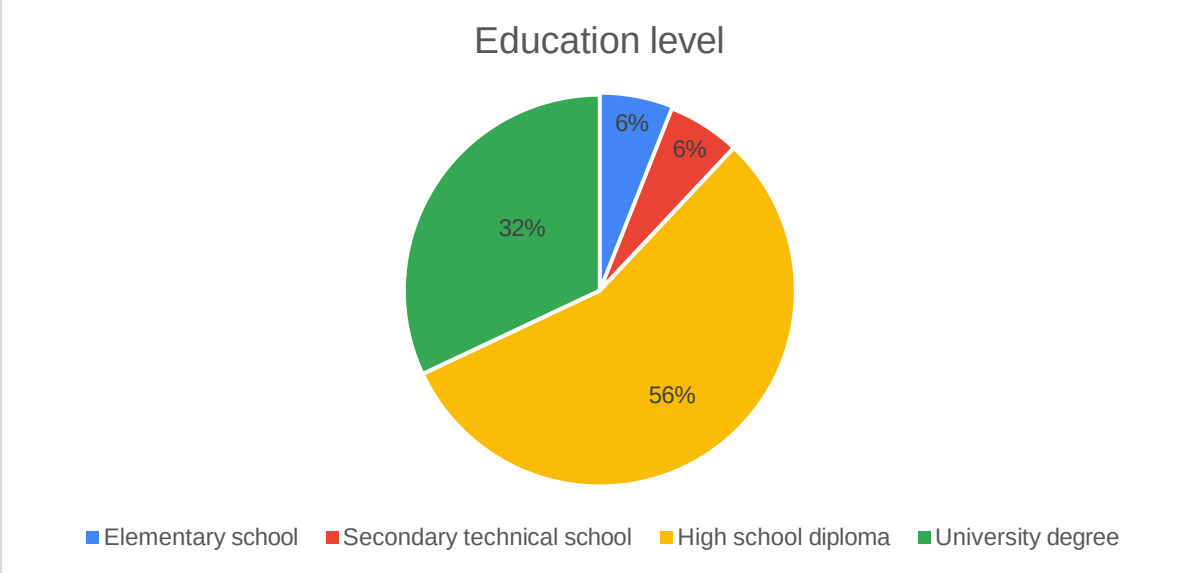

Figure 4. Shows the data of respondents' educational level.

As high amounts of respondents are young adults with finished secondary education, it can be assumed that most of the respondents are university students or entry-level employees.

The survey inquired about respondents' functional food knowledge and willingness to try new dietary trends or habits. It was arranged through Google Forms opened on 01.02.2025 and closed on 01.04.2025. The results were downloaded from Google Forms on 01.04.2025. The data was processed in Microsoft Excel, which is the source of the figures.

Regarding whether respondents had already heard of functional food, 44% of

respondents answered yes, and 56% answered no, which shows that a moderately smaller number of people had heard of functional food than those who had not (Figure 5). Of those who

answered yes, more respondents found this topic interesting than those who did not. Fourteen percent of the respondents had never heard of functional food and showed no interest in new dietary trends.

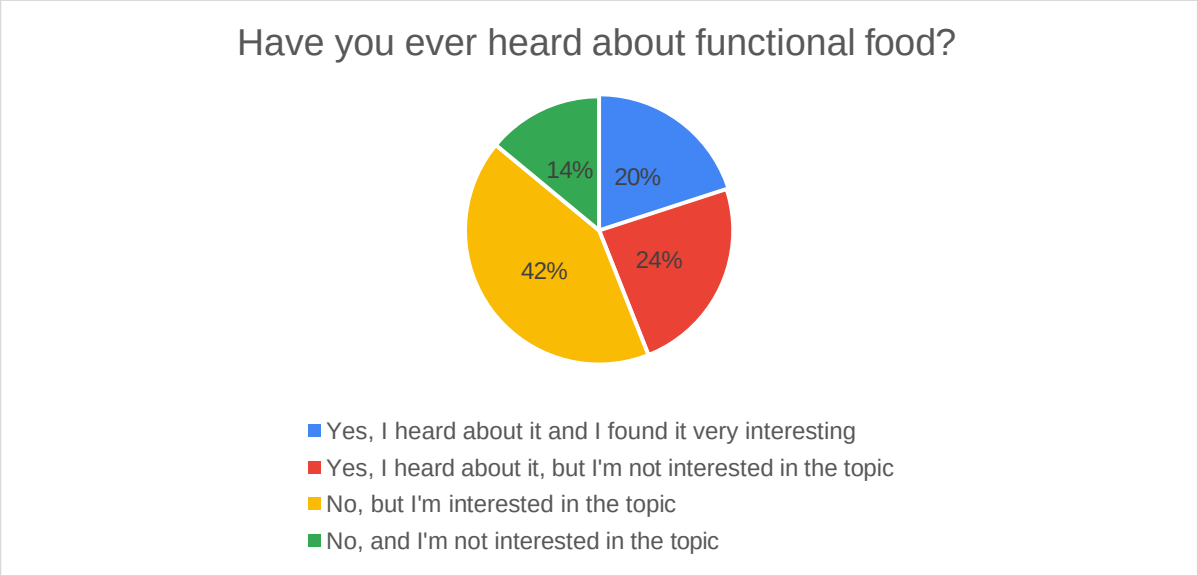

Figure 5. Answers to the question of whether respondents have already heard about functional food.

The highest proportion of respondents indicated that they are interested in the topic but have not yet heard of functional food, which suggests that education on the topic is needed in the examined control group. To explore the dietary habits of the control group, they were asked if they consumed any food that had any health-beneficial effects. Half of the respondents answered yes to this question. 42% of them have already planned to consume these foods, and only 8% of respondents have no interest in consuming health-beneficial foods. The most popular choices of respondents were ginger, fruits, herbal teas, chia seeds, and fermented food products. More than half of the respondents consume health-beneficial food products daily, 27% of them weekly, and 14% of them monthly. The volume of 54% daily consumption may be an exaggerated result, as respondents tend to choose answers that make them feel they have chosen the correct answer, in this case, to appear more health-conscious, even if the survey is anonymous.

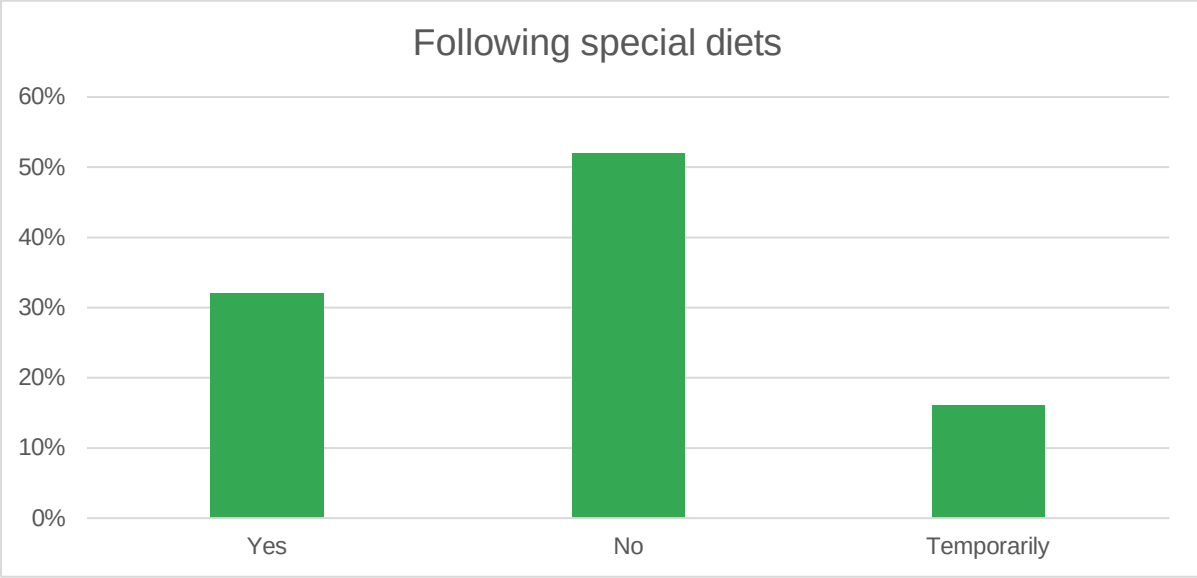

Figure 6. Shows the proportion of the following special diets.

The topic of special diets yields more realistic results. According to Figure 6, only 32% of respondents follow special diets, 52% do not, and 16% follow special diets temporarily. These results indicate that the proportion of respondents who follow special diets and those who do not are nearly equal. In contrast, many who answered '*yes*' only temporarily follow special diets. In most cases, temporary diets are followed for certain reasons, such as weight loss, muscle gain, detoxification, or religious reasons. The research does not focus on special diets. However, the demand for restaurants offering alternative food options for individuals following special diets is a valuable insight for the research. Most respondents follow a gluten- and lactose-free diet, as shown in Figure 7.

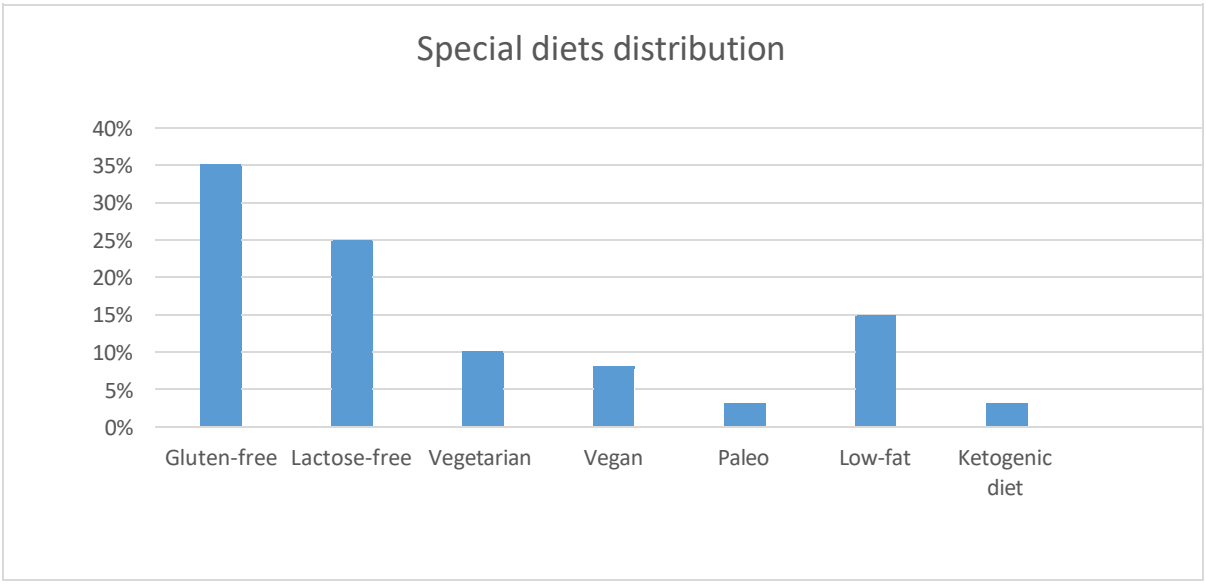

Figure 7. Shows the distribution of special diets respondents follow.

Twenty percent of the respondents follow a low-fat diet, which is an outstanding result considering Hungary's cultural heritage in nutrition and cuisine. Low-fat content food products

are an interesting topic in the hospitality industry, as fat content significantly influences the taste of the meals provided. Not every food product is compatible with low-fat preparation methods, such as deep-fried dishes. All in all, 39% of respondents follow a special diet that is not related to food allergies, for example, vegan and paleo. This result indicates that in the examined group, one-third of respondents follow a special diet by choice.

Almost the same number of respondents, 46%, answered '*yes*' to the question of whether their restaurant choices are influenced by the health-beneficial effects of the food they serve. This answer reinforces the results of the previous question about the chosen special diets respondents follow. This indicates that customers demand education on the meals offered by restaurants, including information on allergens, as well as the amounts of vitamins, fiber, and other health-influencing components of food products. However, customers following special diets might seek places that provide meals that fulfil their needs. From a managerial perspective, effective communication of the health-beneficial effects of meals could be a pull factor for health-conscious consumers.

The second part of the survey examined the openness and knowledge of respondents regarding medicinal plants. More than half of the respondents have already heard about the possibilities of using medicinal plants in culinary according to Figure 8. Half of them have already used medicinal plants for cooking purposes. Only 8% of respondents answered that they had never heard of medicinal plants as a raw material for cooking and were not interested in the associated opportunities, which suggests that the examined group is already interested in the topic or familiar with these methods.

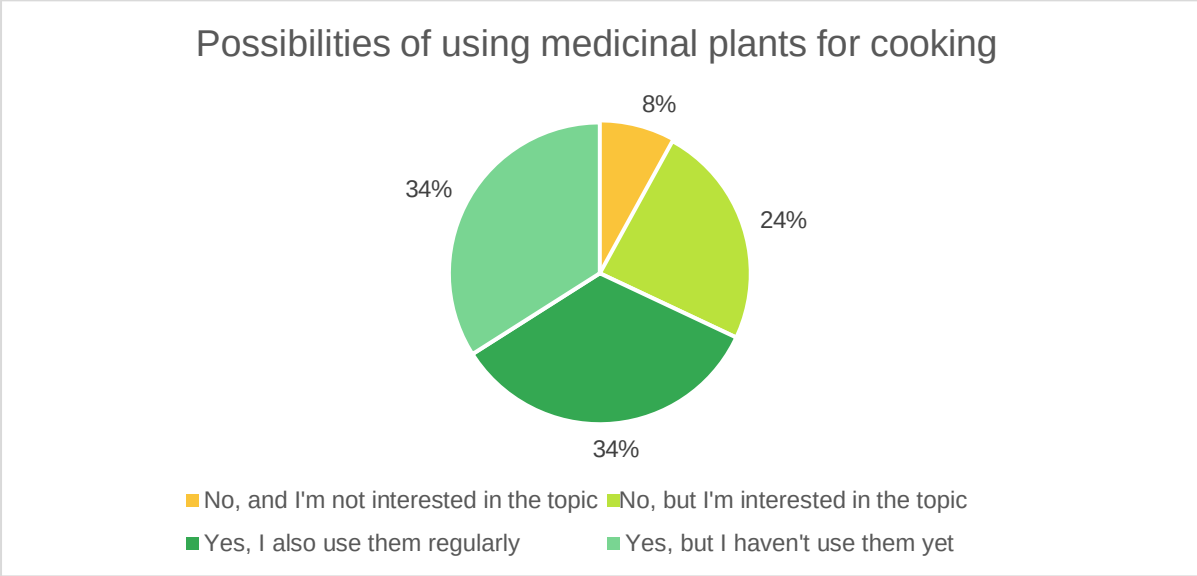

Figure 8. Answers to whether respondents would use medicinal plants for cooking purposes.

Respondents chose the ones they were more likely to consume from a list to better

understand their willingness to consume medicinal plants and which kinds are more favourable. According to Figure 9, the most popular ones were mint, lavender, and thyme, with more than

thirty votes. Sea buckthorn also achieved high scores, up to twenty-seven votes, which is an outstanding result as it is a less well-known medicinal plant.

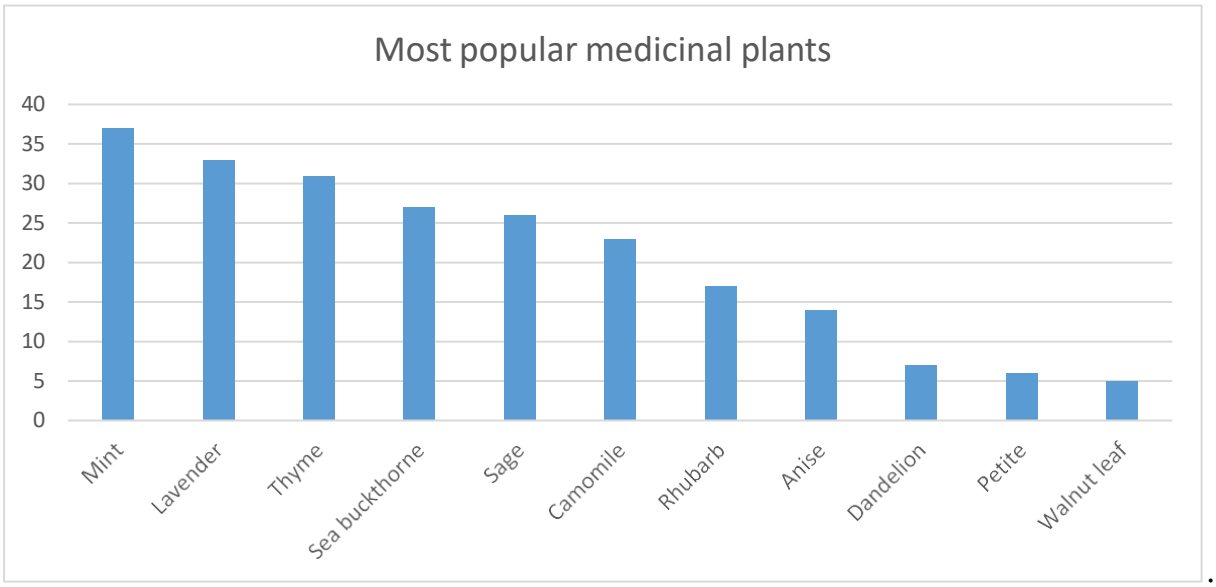

Figure 9. Shows the most popular choices of respondents in medicinal plants.

The last three questions assessed respondents' knowledge of medicinal plants' health-beneficial effects. Respondents paired medicinal plants with different health benefits, such as anti-inflammatory, blood pressure-reducing, and digestion-enhancing. Most respondents chose the correct option for the first question, as chamomile and sea buckthorn are highly inflammatory. The second question about blood pressure-reducing medicinal plants was more controversial, and each answer received almost the same number of votes. Most votes were for sage, which was not the correct answer. For the last question about digestion-enhancing medicinal plants, most respondents chose the correct answers, but the distribution of the votes was slightly similar to the previous question. All in all, the quiz in the last part highlighted the need for better education on medicinal plants in the examined group.

4.3. Conclusions

According to the FAO definition from 2001, functional food refers to those that provide health benefits beyond essential nutrition, demonstrating specific health or medical benefits, including the prevention and treatment of disease (FAO,2001). However, this definition has had multiple controversies in the last two decades. Promoting and marketing dietary supplements and food products that have special, added properties is challenging as the regulatory system varies between countries regarding these food products. Although the demand for healthy food products continuously grows, new dietary trends are spreading. Hospitality businesses should consider how they can target new markets and influence the health consciousness of customers. The research aimed to answer questions regarding the role of functional food and medicinal plants in a healthy diet and hospitality.

The exploration of different approaches to functional food research resulted in a better understanding. Professionals expanded the FAO definition to create a functional food definition that better describes these food products and differentiates them more effectively from other dietary supplements and superfoods. New definitions suggest that functional foods are novel, formulated food products containing biologically active compounds such as nutrients, biochemicals, dietary fibres, or probiotics to provide clinically proven and documented health benefits. Functional foods are not pharmaceutical medicines the consumption aims to prevent and treat chronic diseases naturally (Temple, 2022; Martirosyan et al., 2021).

The research highlighted a few functional food components, such as dietary fibres, kefir, açaí, and walnuts. These raw materials can create attractive food products for health-conscious customers. For a better understanding of the customers' perspective, in the questionnaire, respondents consuming health-beneficial food products were asked to give examples, such as fermented products, kefir, walnuts, fruits and vegetables, nuts and medicinal herbs, which they listed. These results reinforce that the food products in the research have a great opportunity for application in hospitality.

Dietary fibres have a positive effect on digestion, their most common sources are cereals, fruits, vegetables, and nuts. According to the results of the questionnaire, they are consumed by a high proportion of respondents. They are a great source of nutrients and contribute to a balanced diet as they reduce the time of intestinal transit, glycaemic level, and cholesterol, which helps to prevent diabetes and cardiovascular diseases (Dhingra et al., 2011). For formulating functional food, oat hulls and waste parts of fruits have great potential as they contribute to the final product's flavour. Furthermore, the use of food waste parts to formulate new products could be beneficial for the environment, too. The pressing method results in high

amounts of leftovers during the processing of fruits and herbs to produce juices and oils. Fifteen million tons of by-products are left from citrus products yearly, which is an important problem

for producing countries. All of these by-products are novel sources of dietary fibres. The appropriate processing methods can be added to bakery products to enhance their dietary fibre content. In the case of hospitality businesses, reusing plant waste from juices and smoothies in bakery products can be a new way to contribute to sustainability and enrich the existing food products with health-beneficial components.

Acai is an excellent example of how an exotic, less well-known food product can become widely accepted by being introduced as a functional food component. Açaí has been known for a long time as a health-beneficial fruit in the local communities of the Amazonian Forest, where the palm is native. As the definition states, functional foods are formulated food products. Açaí yoghurts, drinks, and ice creams are functional food products. The example of açaí highlighted that customers tend to accept new ingredients in food products they already know and consume regularly. This phenomenon highlights the role of functional food in promoting healthy diets and lifestyles. Açaí also has excellent potential as a natural food preservative regarding its antioxidant properties.

Medicinal plants are a branching topic, as the study of ethnobotany and the use of plants for curing illnesses dates back to ancient times. The approaches and popularity of different medicinal plants vary by culture, as other territories have different environments. However, in Western cultures, alternative medical approaches are gaining interest again. Education is essential on this topic, too. Literature has proven that medical students are interested in the topic, and the proper knowledge on alternative medical approaches from both the patients' and the medical workers' side is a key to building trust and consuming these products safely. The questionnaire has also proven that respondents are interested in the topic, as 24% of those who haven't heard about medicinal plants in culinary are interested.

The research highlighted some of the medicinal plants, both from the Hungarian and the worldwide scope.

Spirulina is one of the medicinal plants that has gained popularity lately as a functional food component or a dietary supplement, too. It is marketed in different forms such as capsules, chocolate, biscuits, and pasta. The successful marketing of spirulina in various forms is a promising approach for other medicinal plants, as customers tend to be more open to health-beneficial food products with a familiar taste and texture. The experiment on the spirulina added chocolate milk by Rasia et al. has proven that statement, as from the different samples with different concentrations of spirulina, the most popular was the one with the most similarities with the original regarding colour, taste, smell and texture. The experiment also suggested a

new approach, so-called nanoencapsulation, which has great potential for preserving both the

beneficial properties of the raw material and the properties of the base product that customers accept.

Lavender is one of the most popular and well-marketed medicinal plants. Respondents for the thesis questionnaire chose lavender as the second most consumed medicinal plant from the provided list. It is used in various forms, such as essential oil and cosmetological products, but its role in culinary preparation is also vital for food colouring and seasoning. Lavender, similar to other essential oil raw materials, has the potential to be used for functional food production as the by-products own the health beneficial properties and the flavour of lavender is widely accepted by customers. Elderberry, similarly to lavender, is a highly popular medicinal plant. It has a high potential as juice, wine or jam from the hospitality point of view. In the case of existing well-known food products, the audience's education is the key point. Less health-conscious customers might not know the product's benefits, which could influence their choice later. The questionnaire also proved that even 68% of respondents are familiar with medicinal plant usage, the quiz part showed that most respondents don't know their exact health benefits. On the other hand, knowing that healthy food products are not necessarily exotic and could be delicious would grow the trust for trying new, less accustomed options.

All in all, the research based on the literature highlighted that medicinal plants' most considerable potential as functional foods lies in using the waste part of the processing. Education is also significant on the topic for growing trust in new food products.

The research also examined the contribution of functional foods and medicinal plants to the tourism and hospitality industry. This part of the research focused on Hungary and reviewed the potential of these food products regarding factors such as cultural heritage and environmental opportunities. According to Törőcsik & Csapó, health is one of the most significant tourism trends, including connecting with nature and seeking traditional knowledge and treatment, which proves that functional food and medicinal plants in the tourism and hospitality industry have opportunities in the future. It is proven that customers are getting more influenced by the nutritional value of a restaurant's menu items in the literature and thesis research. This phenomenon suggests that in the future, restaurants should consider expanding their offer with healthier options to fulfil the demand of health-conscious customers. According to the questionnaire results, 46% of respondents were influenced by the restaurant's menu items' health-beneficial effect, which suggests that restaurants should shift their offer to healthier options to reach those customers.

Wild food consumption has a tradition in Europe, especially in the continent's forestry

areas. Restaurants that serve wild food fulfil the demand for connection with nature, as those food products are collected or hunted. Restaurants with this profile are mainly located in natura

environments, where raw materials are easily accessible. However, overall wild food consumption declined in recent years, suggesting future improvement. Wild food consumption also contributes to the tourism industry, as hunting trips and mushroom and plant collection day trips provide recreational activities for tourists. In Hungary, it could also be an excellent approach for rural tourism development.

From the marketing point of view, the most significant challenge is consumers' scepticism about new food products. For a successful market expansion, there should be synergy between customers' demand, marketers, and scientists. Customers' awareness is key to successfully incorporating functional food and medicinal plants in hospitality. Labelling is a significant factor. According to research, customers tend to accept food products labelled as "wellness" rather than those described scientifically only. This phenomenon highlights the lack of education, but labelling can efficiently bring customers closer to these kinds of food products without scientific knowledge of them, as the demand already exists. However, as the research earlier highlighted, the labelling of functional food products is a controversial topic without a unified description of these food products. Communication is also key in building trust and increasing customers' awareness of these products. For restaurants, seasonal menu offers could be a great option to let customers try new products and decide which items stay on the menu based on the product's popularity.

According to the Hungarian Tourism Agency, there are significant differences between the capital, Budapest, and the countryside regarding new market trends for Hungarian hospitality businesses. Restaurants provide fewer options for special dietary needs. However, incorporating medicinal plants into the menu has a greater potential in rural hospitality businesses, as raw material supply is more accessible in the countryside than in the capital. The Hungarian government support rural development. From the tourism and hospitality point of view, the latest development strategy of the Hungarian Tourism Agency places a great emphasis on the opportunities of rural areas for recreational and health tourism. Support from the government for local small and medium enterprises and farmers could enhance the widespread use of medicinal plants and the awareness of these products.

The Lavender House in Tihany is a great example of raising awareness for medicinal plants. Visitors can learn about the history of lavender cultivation at Tihany, the processing methods and opportunities for using lavender. Food festivals also have high potential for introducing medicinal plants and related food products to future customers. For example, shallots gained significant popularity since the first shallot festival was organised ten years ago. Food festivals provide opportunities for farmers and small and medium enterprises to introduce

themselves, raise awareness about their products and educate visitors about the health benefits of the promoted food products.

Concerning Hungary, wine production has a long history and is also influenced by changing trends in nutrition. Organic wines have gained popularity lately, and new production methods have entered the industry. The research of Bene, 2019 on orange wine and its opportunities for the future highlights that, with latest technologies, producers can create novel beverages, which fit into the definition of functional food, as it states that a product can be considered functional food if its formulated with bioactive compounds to enhance its health beneficial properties. Orange wines are fermented on orange peel, which results in a wine richer in phenolic compounds than regular ones, strengthening the health-promoting properties of wines. For Hungarian wine makers, organic wines can be a niche market, to reach new customers who seek innovative, unique and healthier wines. From the marketing point of view, "organic" labelling contributes to the success of these products, as behind organic products, there is a strict regulatory system, and the word is more familiar to consumers. As mentioned earlier, labelling and trust in alternative food products and production methods are key to marketing.

The challenges of rural hospitality businesses are highlighted as the interviewed restaurant manager's business is located in the countryside. From the managerial point of view, the higher prices for alternative ingredients (vegan, gluten- or lactose-free) are higher than regular ones, negatively influencing cost efficiency. However, fulfilling the demand from special-dietary guests is a significant challenge. The questionnaire proved that there is a need to renew traditional Hungarian cuisine, as a low-fat diet was the third most frequently chosen special dietary option. Incorporating functional food and healthy options into the menu is challenging, especially for restaurants operating with traditional, Hungarian cuisine. Medicinal plants have a greater potential for restaurants with this profile. The professional interview highlighted that the best approach to expand the menu with healthier options cost-efficiently is seasonal offers, introducing new ingredients to guests and testing whether they like it or not. This testing takes a longer time than changing a menu completely. However, this way, restaurants will not lose guests by renewing the menu and shifting to a healthier profile. Conserving the traditional, Hungarian-style cuisine and following new trends, such as health consciousness and special dietary habits, is a significant challenge for restaurants, as some herbs and their flavours wouldn't be the same in low-fat meals. According to the professional interview, when introducing a new raw material as a seasonal offer component, it is crucial to create various meals to reach a broad audience, such as meat-based meals, vegetarian options and desserts.

The results of the questionnaire show a demand for new food products that promote a

healthy lifestyle. From a special diet point of view, high proportions of respondents follow special diets, reinforcing the demand for alternative offers from hospitality businesses. Both

functional food and medicinal plants have great potential, as respondents found the topic interesting. However, the questionnaire quiz part also proved the need for further education, as many respondents chose incorrect answers to the questions.

The research investigated the criteria that need to be fulfilled to consider food a functional food and examined the existing literature on the topic. Numerous new studies regarding functional food have verified the interest in alternative food and the opportunities for the industry. The topic of alternative, health-beneficial food products and dietary supplements is a branching industry. For functional food, a more precise regulatory system would enhance the proper labelling and education of the target audience. The professional interview and literature reinforce the new dietary trends influencing hospitality businesses. The questionnaire proved the demand from the audience for functional food, special dietary and medicinal plants in hospitality, and the more frequent appearance of those food products on restaurants' menus would reach a wider audience. Medicinal plant usage in culinary has various health-beneficial effects based on the plant species. However, further education of professionals and the audience is recommended as well. It has great hospitality potential, as it is easily sourced locally in rural areas, contributing to a sustainable supply of raw materials. For the Hungarian tourism industry, medicinal plants have great potential. Venues such as food festivals, wild food collection day trips, and visitor centres, besides raising awareness for medicinal plants, attract tourists to rural areas, contributing to the local economy and rural development.

5. Summary

The research consisted of a literature review, a professional interview and a questionnaire to assess customers' demand for functional food and medicinal plants in hospitality after exploring the current research results. The professional interview highlighted a growing demand for special dietary needs, such as vegan, lactose—and gluten-free menu items. However, the price of ingredients for those menu items is higher, negatively influencing cost efficiency. The interview also highlighted that buffet catering makes it harder to educate guests about the composition of the meals; thus, for the education of customers, other restaurant concepts might fit better, which include a detailed menu card. Traditional Hungarian cuisine is highly popular, and the demand and trends in restaurants providing this kind of dish have not changed in the last five to ten years. Changing the recipes for healthier meals is a great challenge, as customers expect the well-known flavours, and changing the composition of the food to lower fat content influences the food's flavour and texture. However, the questionnaire results suggest a renewal of traditional Hungarian cuisine as a low-fat diet is gaining popularity among younger generations. Plant-based meals have great potential as the cooking method includes less fat and serves the demand for vegetarian and vegan dietary habits. Seasonal offers are great for expanding the menu with healthier alternative items. They can also give valuable insights about which new menu items should be added to the permanent menu offer based on which ones were the most popular. This method contributes to composing a new, healthier menu more efficiently. However, it takes a longer period than changing the whole menu completely. Concerning the seasonal offers, seasonality should be a consideration in menu planning, as it determines the raw materials for the seasonal offers and contributes to sustainability. However, weather highly influences seasonal products, making managerial planning harder.

The questionnaire provided valuable insights into customers' dietary habits and interests. The following factors can be determined for the examined control group, which was young adults studying at university or filling entry-level jobs. Respondents are mostly interested in functional food, as 62% of respondents chose the answer option, indicating they are interested. More than half of the respondents have heard about functional food, but surprisingly, not all were interested. Almost 1/3 of the respondents follow special dietary habits. These potential customers demand restaurant menu items that fulfil their special dietary needs. Another interesting result was that 39% of respondents follow a special diet unrelated to food allergies. The most popular of those was a low-fat diet, which is a promising result in relation to a healthy diet.

The research on medicinal plant usage also indicated promising results. 64% of respondents are familiar with these methods, and an additional 24% who haven’t heard about

medicinal plants in culinary are interested in the topic, which indicates a great potential to make restaurant’s menu offers more diverse by including medicinal plants in menu items. Customers’ interest in different medicinal plants was also assessed, highlighting that mint, lavender, and thyme were the first three most popular medicinal plants; they can be considered widespread culinary herbs. Surprisingly, sea buckthorn was the fourth most popular choice of respondents, highlighting that less traditional products can also reach a broad audience. The quiz part of the questionnaire highlighted the possibility of error regarding respondents' awareness of the health benefits of medicinal plants. The quiz, which consisted of three questions, showed that further education on the topic of audition is necessary. The control group’s age and education level could also influence that result, as typically older generations have greater knowledge of medicinal plants' health influence and diseases, such as high blood pressure and digestive diseases, mainly affecting elderly people rather than young adults.

The research highlighted the demand for restaurants to adjust to new dietary trends while preserving the well-known, traditional flavours. This phenomenon is a great challenge for the hospitality industry. However, customers' openness helps shift restaurants’ offerings to health-promoting options. Education is a key for customers and restaurant operators to renew the offerings successfully. Marketing communication and labelling could support education in a high proportion.. Medicinal plants, besides supporting the creation of health-beneficial menu items, have a high potential for rural areas from the hospitality and tourism industry as well.

According to the FAO definition from 2001, functional food refers to those that provide health benefits beyond essential nutrition, demonstrating specific health or medical benefits, including the prevention and treatment of disease. However, since 2001, there have been multiple discussions about the complexity of healthy dietary supplements, which influenced the concept of functional food. A healthy diet is composed of different elements of nutrition. In a balanced diet, individuals must consider which type of nutrient to consume and their effect on the human body. Medicinal plants have various beneficial effects on health, and they can be added to the processing of conventional food to create functional food. Their most common use is as a beverage, mainly in tea or syrup, but as the plants are consumable, they could be used for seasoning or raw material for dishes such as sauces, jams, and soups. The questionnaire provided valuable insights into customers' dietary habits and interests. The following factors can be determined for the examined control group, which was young adults studying at university or filling entry-level jobs. Respondents are mostly interested in functional food, as 62% of respondents chose the answer option, indicating they are interested. More than half of the respondents have heard about functional food, but surprisingly, not all were interested. Almost 1/3 of the respondents follow special dietary habits. These potential customers demand restaurant menu items that fulfil their special dietary needs. Another interesting result was that 39% of respondents follow a special diet unrelated to food allergies. The most popular of those was a low-fat diet, which is a promising result in relation to a healthy diet. The professional interview highlighted a growing demand for special dietary needs, such as vegan, lactose—and gluten-free menu items. However, the price of ingredients for those menu items is higher, negatively influencing cost efficiency. The interview also highlighted that buffet catering makes it harder to educate guests about the composition of the meals; thus, for the education of customers, other restaurant concepts might fit better, which include a detailed menu card.

Traditional Hungarian cuisine is highly popular, and the demand and trends in restaurants providing this kind of dish have not changed in the last five to ten years. Changing the recipes for healthier meals is a great challenge, as customers expect the well-known flavours, and changing the composition of the food to lower fat content influences the food's flavour and texture. However, the questionnaire results suggest a renewal of traditional Hungarian cuisine as a low-fat diet is gaining popularity among younger generations. Plant-based meals have great potential as the cooking method includes less fat and serves the demand for vegetarian and vegan dietary habits. Seasonal offers are great for expanding the menu with healthier alternative items. They can also give valuable insights about which new menu items should be added to the permanent menu offer based on which ones were the most popular. This method contributes to composing a new, healthier menu more efficiently. However, it takes a longer period than

changing the whole menu completely. Concerning the seasonal offers, seasonality should be a consideration in menu planning, as it determines the raw materials for the seasonal offers and contributes to sustainability.

The research highlighted the demand for restaurants to adjust to new dietary trends while preserving the well-known, traditional flavours. This phenomenon is a great challenge for the hospitality industry. However, customers' openness helps shift restaurants' offerings to health-promoting options. Education is a key for customers and restaurant operators to renew the offerings successfully. Marketing communication and labelling could support education in a high proportion.. Medicinal plants, besides helping the creation of health-beneficial menu items, have a high potential for rural areas from the hospitality and tourism industry as well.

6. Bibliography

1. Adefegha, S. A. & Oboh, G. & Oluokun, O. O., 2022. Food bioactives: the food image behind the curtain of health promotion and prevention against several degenerative diseases. *Studies in Natural Products Chemistry*, [e-journal] 72(11), pp. 391-421. https://doi.org/10.1016/B978-0-12-823944-5.00012-0.
2. Ajila, C.M. & Aalami M. & Leelavathi, K. & Rao, P.U.J.S., 2010. Mango peel powder: A potential source of antioxidant and dietary fiber in macaroni preparations. *Innovative Food Science and Emerging Technologies*, [e-journal] 11(1), pp. 219- 224. https://doi.org/10.1016/j.ifset.2009.10.004.
3. Andrade, M.A. & Barbosa, C.H. & Shah, M.A. & Ahmad, N. & Vilarinho, F. & Khwaldia, K. & Silva, A.S. & Ramos, F. Citrus By-Products: Valuable Source of Bioactive Compounds for Food Applications. *Antioxidants*, [e-journal] *12*(1), p. 38. https://doi.org/10.3390/antiox12010038
4. Bellucci, E. & Santos, J. & Carvalho, L. & Borgonovi, T. & Lorenzo, J. & Silva-Barretto, A., 2022. Açaí extract powder as natural antioxidant on pork patties during the refrigerated storage. *Meat Science*, [e-journal] 184, 108667. https://doi.org/10.1016/j.meatsci.2021.108667.
5. Beulah, N. J. & Umanandhini, D., 2024. Medicinal plant species detection by comparison review. *Journal of the Saudi Society of Agricultural Sciences*, [e-journal] 2024 https://doi.org/10.1016/j.jssas.2024.09.005
6. Bene, Zs., 2018. A qvevri borkészitési eljárás és a narancsborok létjogosultsága a gasztronómiai újdonságok körében. In. Dankó, L., ed., 2018. *Narancsbor. Fejezetek a gasztronómiai újdonságok témaköréből.* Bodrogkeresztúr: Tokajbor-Bene Pincészet, Szőlőbirtok és Borkereskedelmi Kft. pp. 9-17.
7. Bene, Zs. & Papp, A. & Piskóti, I., 2019. A Narancsborok pozicionálási lehetőségei a hazai borfogyasztói szegmensekben. In: Veres, Z. & Sasné, G. A. & Liska, F., ed., 2019. *Ismerjük a vevőt? A vásárlás pszichológiája - Az Egyesület a Marketing Oktatásért és Kutatásért XXV. Országos Konferenciájának előadásai*. Veszprém: Pannon Egyetem. pp. 412–422.
8. Bhattarai, N. & Karki, M., 2004. MEDICINAL, FOOD AND AROMATIC PLANTS | Medicinal and Aromatic Plants: Ethnobotany and Conservation Status. In: Evans, J. & Youngquist, A. J., ed., 2004. *Encyclopedia of Forest Sciences.* London: Academic Press. pp. 523-532.
9. Birwal, P. & Gautre, D. & Gunjal, M. & Rasane, P. & Singh, J. & Azad, M. S., 2025. Development of a lemongrass-based kefir beverage and evaluation of its quality of life. *South African Journal of Botany*, [e-journal] 176, pp. 37-48. https://doi.org/10.1016/j.sajb.2024.11.010.
10. Codex Alimentarius Commission, 2024. *Report of the 47th session of the Codex Alimentarius Commission.* [e-book] Geneva: Food and Agriculture Organization of the United Nations & World Health Organization. Available at: https://www.fao.org/fao-who-codexalimentarius/sh-proxy/ru/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-701-47%252FCRDs%252FCRD02%252Fcac47_crd02x.pdf [Access date: 14.12.2024.]
11. Cortina A. R. & Carrión M. H., 2025. Amazonian fruits in Colombia: Exploring bioactive compounds and their promising role in functional food innovation. *Journal of Food Composition and Analysis*, [e-journal] 137(A), 106878. https://doi.org/10.1016/j.jfca.2024.106878.
12. Dénes, A. 2018. Vadon termő tápláléknövények, „vad" erjesztésű növényi ételek és italok, mint a magyar népi konyha bio- és gasztrokulturális örökségei. Jó gyakorlat és lehetőségek a vendéglátásban. In: Csapo, J. & Gerdesics, V. & Törőcsik, M., ed., 2018. *Generációk a turizmusban: I. Nemzetközi Turizmusmarketing Konferencia: Tanulmánykötet*. Pécs: Pécsi Tudományegyetem Közgazdaságtudományi Kar (PTE KTK). pp. 403-411.
13. Dhingra, D. & Michael, M. & Rajput, H. & Patil, R., 2012. Dietary fibre in foods: a review. *Journal of Food Science and Technology*, [e-journal] 49(3), pp. 255–266. https://doi.org/10.1007/s13197-011-0365-5
14. Drača, N. & Aladić, K. & Banožić, M. & Šubarić, D. & Jokić, S. & Nemet, I., 2025. Chamomile waste: A comprehensive insight on phytochemical and safety profile, extraction techniques and potential application. *Biocatalysis and Agricultural Biotechnology*, [e-journal] 63, 103468. https://doi.org/10.1016/j.bcab.2024.103468
15. Enri, S. R. & Falla, N. M. & Demasi, S. & Bianchi, D. M. & Squadrone, S. & Lombardi, G. & Scariot, V., 2024. Exploring the potential of wild leafy vegetables widespread in European Alps as functional food. *Journal of Agriculture and Food Research*, [e-journal] 18, 101368. https://doi.org/10.1016/j.jafr.2024.101368.
16. Erfurth, P., 2018. Phytotherapy and naturopathy in the training of doctors and pharmacists. *Zeitschrift fur Phytotherapie* [e- journal] 39(3), pp. 105-111. http://doi.org/10.1055/a-0590-9783
17. Filannino, P. & Cagno, R. D. & Gobbetti, M., 2018. Metabolic and functional paths of lactic acid bacteria in plant foods: get out of the labyrinth. *Current Opinion in Biotechnology*, [e-journal] 49, pp. 64-72. https://doi.org/10.1016/j.copbio.2017.07.016.
18. Food and Agriculture Organization of the United Nations & World Health Organization, 2003. *Standard for fermented milks CXS 243-2003*. Rome: Food and Agriculture Organization of the United Nations & World Health Organization
19. Givens, D.I., 2020. MILK Symposium review: The importance of milk and dairy foods in the diets of infants, adolescents, pregnant women, adults, and the elderly. *Journal of Dairy Science*, [e-journal] 103(11), pp. 9681–9699. https://doi.org/10.3168/jds.2020-18296.

20. Habib, M. A. B. & Parvin, M. & Huntington, T. C. & Hasan, M. R., 2008. *A review on culture, production and use of spirulina as food for humans and feeds for domestic animals and fish*. [e-book] Rome: Food And

Agriculture Organization of The United Nations. Available at: https://www.fao.org/4/i0424e/i0424e00.pdf [Access date: 05.02.2025.]
21. Ihász, F., 2018. *Egészségnevelés.* Budapest: Akadémiai Kiadó.
22. Kajjari, S. & Joshi, R. S. & Hugar, S. M. & Gokhale, N. & Meharwade, P. & Uppin, C., 2022. The Effects of Lavender Essential Oil and its Clinical Implications in Dentistry: A Review. *International Journal of Clinical Pediatric Dentistry*, [e-journal] 15(3), pp. 385–388. https://doi.org/10.5005/jp-journals-10005-2378
23. Kiss, G. & Boldog, V., 2021. *Dísznövénytermesztés és gyógynövény-felvásárlás 2020. év.* Budapest: Agrárközgazdasági Intézet Nonprofit Kft.
24. Központi Statisztikai Hivatal, 2019. *Táplálkozás, tápláltság, 2019* Available at: https://www.ksh.hu/docs/hun/xftp/idoszaki/elef/taplalkozas_2019/ [Access date: 25.12.2024.]
25. Központi Statisztikai Hivatal, 2019. *Tehetünk az egészségünkért* Available at: https://www.ksh.hu/docs/hun/xftp/idoszaki/elef/te_2019/index.html#tovbbiadatokinformcik [Access date: 25.12.2024.]
26. Krenn, L. & Burkart, M., 2024. The attitude of medical students concerning herbal medicinal products/ phytopharmaceuticals/phytotherapy in different regions of Europe. *Phytomedicine Plus,* [e- journal] 4(2), 100525. https://doi.org/10.1016/j.phyplu.2024.100525.
27. Magyar Turisztikai Ügynökség, 2023. *Turizmus 2.0* [e-book] Budapest: Magyar Turisztikai Ügynökség. Available at: https://mtu.gov.hu/dokumentumok/NTS2030_Turizmus2.0-Strategia.pdf?v=0.159 [Access date: 13.02.2025.]
28. Maksimović, V. & Maksimović, J. D., 2017. Chapter 4 - Composition, Nutritional, and Therapeutic Values of Fruit and Berry Wines. In: Kosseva, M. R. & Joshi, V.K. & Panesar, P.S., ed., *Science and Technology of Fruit Wine Production*. s.l.: Academic Press. pp. 172-226. https://doi.org/10.1016/B978-0-12-800850-8.00004-1.
29. Martirosyan, D. & Kanya, H. & Nadalet, C., 2021. Can functional foods reduce the risk of disease? Advancement of functional food definition and steps to create functional food products. *Functional Foods in Health and Disease,* [e-journal] 11(5), pp. 213-221. https://www.doi.org/10.31989/ffhd.v11i5.788
30. Nassar, A.G. & AbdEl-Hamied, A.A. & El-Naggar, E.A., 2008. Effect of Citrus by-Products Flour Incorporation on Chemical, Rheological and Organolepic Characteristics of Biscuits. *World Journal of Agricultural Sciences,* [e-journal] 4(5), pp. 612-616. Available at: https://idosi.org/wjas/wjas4(5)/14.pdf [Access date: 16.12.2024.]
31. Nemzeti Agrárgazdasági Kamara & Gyógynövény Szövetség és Terméktanács, 2023. *Komoly potenciál van a gyógynövény ágazatban,* [press release] Available at: https://www.nak.hu/sajto/sajtokozlemenyek/105824-komoly-potencial-van-a-gyogynovenyagazatban [Access date: 03.02.2025]
32. Pászk N., 2021. *Multidiszciplináris tudományok,* [e- journal]11(2), pp. 341-344. https://doi.org/10.35925/j.multi.2021.2.45
33. Puligundla, P., Obulam, V.S.R., Oh, S.E., Mok, C., 2014. Biotechnological potentialities and valorization of mango peel waste: a review. *Sains Malays,* [e-journal] 43, 1901–1906. https://doi.org/10.17576/jsm-2014-4312-12.
34. Raffay, Z., 2023. Nemzetközi trendek a vendéglátásban, a vendéglátás jövője. *TERINNO Területfejlesztés és Innováció,* [e-journal] 16(2), pp. 3-22. https://doi.org/10.15170/terinno.2023.16.02.01
35. Rasia, T. A. & Vaz, B. S. & Costa, J. A. V. & Morais, M. G., 2024. Nanoencapsulation of Spirulina sp. LEB 18 microalgae biomass using electrospray technique and application in chocolate milk. *Food and Bioproducts Processing,* [e-journal] 148, pp. 491-506. https://doi.org/10.1016/j.fbp.2024.10.002
36. *Regulation (EU) 2018/848 of the European Parliament and of the council of 30 May 2018.* Accessible at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R0848 [Date of access: 24. 04. 2025.]
37. Rodrigues, E. F. & Vendruscolo, L. P. & Bonfante, K. & Reinehr, C. O. & Colla, E. & Colla, L. M., 2020. Phycocyanin as substitute for texture ingredients in ice creams. *British Food Journal,* [e-journal] *122*(2), pp. 693–707. https://doi.org/10.1108/BFJ-07-2019-0553
38. Rózsa, É., 2023. A tihanyi levendula, mint Veszprém vármegye értéke. *Tihanyi Visszhang,* 18(162), p. 8.
39. Salmerón-Manzano, E. & Garrido-Cardenas, J. A. & Manzano-Agugliaro, F., 2020. Worldwide Research Trends on Medicinal Plants. *International Journal of Environmental Research and Public Health,* [e-journal] *17*(10), 3376. https://doi.org/10.3390/ijerph17103376
40. Sarmento, E. & Loureiro, S. & Martins, R., 2018. Foodservice tendencies and tourists' lifestyle: new trends in tourism. *Revista Turismo & Desenvolvimento* 27(28) pp. 2265-2277.
41. Schulp, C.J.E. & Thuiller, W. & Verburg, P.H., 2014. Wild food in Europe: A synthesis of knowledge and data of terrestrial wild food as an ecosystem service. *Ecological Economics,* [e-journal] 105, pp. 292-305. https://doi.org/10.1016/j.ecolecon.2014.06.018.
42. Sharma, M & Sharma M. & Sahu, S. C. & Sharma, D. & Sharma M., 2024. Walnuts as functional food and nutraceutical: A bibliometric study of research trends on nutritional potential, phytochemistry and its health benefits. *Food and Humanity*, [e-journal] 3, 100387. https://doi.org/10.1016/j.foohum.2024.100387
43. Sharma, R. & Rana, A., 2024. Algal Elixirs: Unraveling the multifaceted impact of Spirulina in human health. *Food Bioscience,* [e-journal] 62, 105365. https://doi.org/10.1016/j.fbio.2024.105365.
44. Silveira J. & Rosa A. & Morais M. & Victoria F. & Costa J., 2023. An integrative review of Açaí (Euterpe

oleracea and Euterpe precatoria): Traditional uses, phytochemical composition, market trends, and emerging applications. *Food Research International*, [e-journal] 173(1), 113304. https://doi.org/10.1016/j.foodres.2023.113304.

45. Smith, T. & Lang, C. & Craft, E., 2024. US Sales of Herbal Supplements Increase 4.4% in 2023. *The Journal of the American Botanical Council*, 141, pp. 54-68.
46. Srivastava, J. K. & Shankar, E. & Gupta, S., 2010. Chamomile: A herbal medicine of the past with bright future. *Molecular Medicine Reports,* [e-journal] 3(6), pp. 895-901. https://doi.org/10.3892/mmr.2010.377
47. Soutelino, M. A. M. & Rocha, R. S. & Mársico, E. T. & Esmerino, E. A. & Oliveira Silva, A. C. O., 2025. Innovative approaches to kefir production, challenges, and current remarks. *Current Opinion in Food Science,* [e-journal] 61, https://doi.org/10.1016/j.cofs.2024.101252.
48. Szakály, Z. & Kiss, M. & Jasák, H., 2014. Funkcionális élelmiszerek, fogyasztói attitűdök és személyre szabott táplálkozás. *Táplálkozásmarketing,* [e-journal] 1(1-2) pp. 3-17. https://doi.org/10.20494/TM/1/1-2/1
49. Temple, N. J., 2022. A rational definition for functional foods: A perspective. *Frontier in Nutrition,* [e-journal] 9, 957516. https://doi.org/10.3389/fnut.2022.957516
50. Terzić, M. & Majkić, T. & Beara, I. & Zengin, G. & Miljić, U. & Đurović, S. Mollica, A. & Radojković, M., 2022. Elderberry (Sambucus nigra L.) wine as a novel potential functional food product. *Food Bioscience,* [e-journal] 50(A), 102047. https://doi.org/10.1016/j.fbio.2022.102047.
51. Tihany Község Önkormányzata & Völgyzugoly Műhely Kft., 2013. *Tihany Településfejlesztési Koncepció Jövőkép, Fejlesztési Célok.* [e-book] Tihany: Tihany Község Önkormányzata. Available at: https://www.tihany.hu/docs/rendeletek/koncepcio/Tihany_koncepcio.pdf [Access date: 26.03.2025.]
52. Törőcsik, M., 2016. A fogyasztói magatartás új tendenciái. *Vezetéstudomány,* [e-journal] 47, pp. 19-25. https://doi.org/10.14267/VEZTUD.2016.04.04
53. Törőcsik, M. & Csapó J., 2018. Fogyasztói trendek hatása a turizmusra. In: Csapó, J. & Gerdesics, V. & Törőcsik, M., ed., 2018. *Generációk a turizmusban: I. Nemzetközi Turizmusmarketing Konferencia: Tanulmánykötet*. Pécs: Pécsi Tudományegyetem Közgazdaságtudományi Kar (PTE KTK). pp. 8-22.
54. Vasileva, I. & Denkova, R. & Chochkov, R. & Teneva, D. & Denkova, Z. & Dessev, T. & Denev, P. & Slavov, A., 2018. Effect of lavender (Lavandula angustifolia) and melissa (Melissa Officinalis) waste on quality and shelf life of bread. *Food Chemistry* [e-journal] 253, pp. 13-21. https://doi.org/10.1016/j.foodchem.2018.01.131.
55. Vicensutto, G. M. & de Castro, R. J. S., 2020. Development of a novel probiotic milk product with enhanced antioxidant properties using mango peel as a fermentation substrate. *Biocatalysis and Agricultural Biotechnology*, [e-journal] 24, 101564. https://doi.org/10.1016/j.bcab.2020.101564.
56. Zaid, A. & Hughes, H. G. & Porceddu, E. & Nicholas, F., 2001. *Glossary of Biotechnology for Food and Agriculture - A Revised and Augmented Edition of the Glossary of Biotechnology and Genetic Engineering* [e-book] Rome: Food and Agriculture Organization of the United Nations. Available at: https://www.fao.org/4/y2775e/y2775e00.htm [Date of access: 14.12.2024.]