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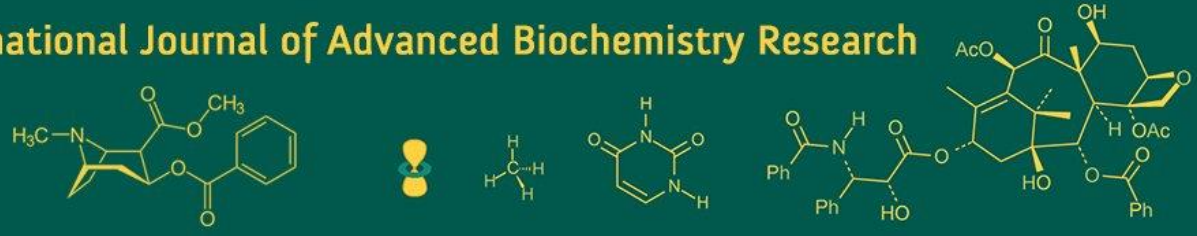

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Flavoured infused water: Nutritional value, health benefits, and consumer trends in functional beverages

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Abstract
Flavoured infused water has rapidly emerged as a popular functional beverage category that combines hydration with health benefits, sensory appeal, and clean-label convenience. This review explores the comprehensive development, nutritional composition, health impacts, consumer preferences, and sensory optimization of flavoured water formulations. Incorporating fruits, herbs, and spices into water not only enhances taste but also delivers essential minerals, antioxidants, vitamins, and in some cases, probiotics—supporting hydration, immune function, digestive health, and metabolic regulation. Studies have demonstrated improved hydration efficiency, antioxidant activity, and therapeutic potential, such as in gout management using pineapple-infused water. Consumer preferences are largely shaped by flavour, aroma, nutritional claims, and health consciousness, particularly among children and young adults. Sensory attributes such as infusion duration, ingredient synergy, and use of peels significantly influence both nutritional value and acceptance. The global market is witnessing rapid growth, driven by demand for natural, low-calorie, functional beverages, with a promising future in personalized and therapeutic hydration. This review highlights current trends, formulation strategies, and research-backed benefits, underscoring flavoured infused water's role in the evolving functional beverage landscape.

Keywords: Flavoured infused water, functional beverages, antioxidant activity, hydration efficiency, nutritional composition, sensory attributes, consumer preferences, therapeutic potential

1. Introduction
Water is fundamental to life, playing a central role in maintaining physiological balance, cellular homeostasis, and metabolic functions. From early evolutionary adaptations to modern-day health maintenance, the importance of adequate hydration is universally acknowledged. Human bodies consist of approximately 60-70% water by weight in adults and up to 75% in infants, underscoring water's indispensable role in sustaining life. (Armstrong and Johnson 2018, Popkin and Rosenberg 2010) [5, 18]. As water is an essential macronutrient that the human body cannot synthesize in sufficient amounts, its adequate intake is necessary to meet physiological needs.

Despite water being the healthiest hydration source, its bland taste can be a deterrent for many individuals, leading to insufficient consumption. To address this, the beverage industry has responded with a wide range of flavoured infused waters, also known as infused water or fruit-infused water, offering both hydration and sensory appeal. These beverages are created by infusing plain or functional water bases with fruits, herbs, spices, and sometimes functional bioactives, improving both taste and potential health benefits.(Barroso *et al.* 2014, Haitami *et al.* 2017) [6, 8]. Ingredients commonly used include lemon, orange, apple, berries, ginger, mint, cinnamon, and tropical fruits like pineapple, contributing not only flavour but also natural antioxidants and micronutrients Thiagarajah *et al.* (2019) [24]

Flavoured infused waters have grown in popularity as a healthier alternative to sugar-laden carbonated beverages, appealing especially to health-conscious consumers. Their market success can be attributed to attributes like low or zero calories, natural ingredients, and added functionality, such as antioxidant activity or electrolyte content. (Barroso *et al.* 2014, Pérez-Rodríguez *et al.* 2017) [6, 17]. Furthermore, the infusion of herbs and spices not only enhances organoleptic properties but also offers antimicrobial and functional properties, making them

a promising category within functional beverages Affno *et al.* (2024) [1]

There has also been a rising interest in probiotic and plant-based flavoured water beverages, offering gut-health benefits without the drawbacks associated with dairy-based probiotic drinks. Fruit juices such as orange, apple, guava, and pineapple have been explored as cost-effective and lactose-free bases for such probiotic-infused drinks.(Refita 2021, Sultan 2022) [20, 22]

The shift in consumer demand toward natural, clean-label, and health-promoting drinks has propelled the global flavoured water market, which was valued at approximately USD 13.5 billion in 2022 and is projected to grow at a CAGR of 7% through 2028.Sabria and Suryani (2023) [21] In particular, regions like Asia-Pacific are witnessing rapid growth due to rising incomes and increasing health awareness.

This review aims to provide a comprehensive overview of formulation strategies, physicochemical stability, sensory attributes, and functional benefits of flavoured infused waters, along with insights into current trends, challenges, and future prospects in this dynamic beverage category.

2. Nutritional Benefits of Flavoured Water

The nutritional attributes of food and beverages significantly influence product development, particularly within the functional food and health beverage sectors. In the context of flavoured infused water, understanding the nutrient composition—such as vitamins, minerals, antioxidants, and dietary fibre—is vital not only for enhancing health benefits but also for meeting the increasing consumer demand for wellness-oriented products. These nutritional components also support targeted formulations catering to specific populations such as athletes, elderly, or individuals with metabolic conditions. Lubis *et al.*, 2024 [13] found that letting cocoa pod skin soak for 6 hours and adding 15% lemongrass extract made the healthiest and most appealing infused water.

Flavoured waters often exhibit enhanced mineral content due to the incorporation of fruits, herbs, and in some cases, functional additives, or preservatives. A study conducted in 2009 analysed the mineral composition of 39 samples of both natural and flavoured waters Using atomic absorption spectrophotometry, it was found that flavoured waters generally contained higher levels of macro-minerals such as calcium (Ca), magnesium (Mg), potassium (K), and sodium (Na), as well as micro-minerals like iron (Fe), copper (Cu), and zinc (Zn). For instance, calcium ranged from 0.2 to 213 mg/L, and potassium was found in concentrations as high as 246.9 mg/L. The elevation in mineral content was attributed to ingredients like potassium sorbate, sodium benzoate, calcium lactate, and citric acid. These additives, while primarily added for preservation or acidity regulation, incidentally contribute to the mineral profile of the beverage Barroso *et al.* (2009) [7].

In addition to minerals, antioxidants are another crucial component enhancing the nutritional value of flavoured waters. A study conducted in 2017 evaluated 32 commercial flavoured water samples in Spain, categorizing them based on their flavour sources—juices, extracts, and aromas. Their results demonstrated that samples containing tea extracts, herbs, or medicinal plants like aloe vera possessed the highest polyphenol content, ranging up to 218.7 mg GAE/L, and exhibited superior antioxidant activity. These compounds help neutralize free radicals and contribute to improved cellular health and reduced oxidative stress Pérez-Rodríguez *et al.* (2017) [17]

The potential for enhancing nutritional properties using agricultural by-products is also gaining attention. A study conducted in 2023 explored this through the development of tepache, a probiotic drink made from pineapple peels Sabria and Suryani (2023) [21]. Their study indicated that pineapple peels, due to their high carbohydrate content (17.53%) and the presence of bromelain, serve as a suitable substrate for lactic acid bacteria (LAB) fermentation. The G1F1 treatment (100 g palm sugar, 3-day fermentation) yielded a high glucose concentration (12.22%) and showcased optimal microbial activity, demonstrating the role of natural sugars and enzymes in supporting fermentation and enhancing functional attributes.

Similarly, infused water from cocoa fruit peel combined with citronella grass extract was investigated Pérez-Rodríguez *et al.* (2017) [17]. They found that increased soaking time (up to 6 hours) and higher extract concentrations significantly enhanced the nutritional profile of the beverage. The formulation yielded high vitamin C content (0.4361%) and antioxidant activity (107.4508 µg/mL). The antioxidant enhancement was attributed to the flavonoids and polyphenols present in citronella extract, while cocoa peel pectin hydrolysis led to mild acidification, further improving bioactive compound extraction.

Natural ingredients such as lemon, dates, cucumber, and watermelon have also been explored in flavoured water formulations. A study conducted in 2025 evaluated different extraction times (2-12 hours) for lemon-infused waters, revealing that a 4-hour extraction of lemon, Cui (Citrus microcarpa), and watermelon combination produced the highest vitamin C content (37.4 mg/100 g), antioxidant activity (21.63%), and total phenol content (0.0112%), with a palatable pH of 4.15 Handayani *et al.* (2025) [9]. These findings support the inclusion of citrus fruits and other fresh produce in infused water formulations to naturally boost functional and nutritional value.

Overall, the nutritional benefits of flavoured infused water go beyond basic hydration. Depending on the ingredients and processing methods used, these beverages can serve as a source of essential minerals, natural antioxidants, probiotics, and bioactive compounds, contributing to better immune function, digestive health, and oxidative stress reduction. Such properties make them a promising category in the growing landscape of functional beverages.

3. Health Benefits of Flavoured Water

Flavoured infused water, particularly those incorporating fruits, vegetables, and herbs, has emerged as a functional beverage offering not only hydration but also a range of physiological and therapeutic benefits. These beverages leverage naturally occurring bioactive compounds—including flavonoids, phenolic acids, vitamins, and enzymes—that are released during the infusion process and contribute to antioxidant, anti-inflammatory, and metabolic health effects.

One of the key functional roles of fruit-infused water is enhancing hydration, especially during physical activity. A study conducted in 2018 assessed the impact of fruit-infused water on hydration status in young adults during endurance exercise. While both plain and infused water resulted in similar reductions in body weight (~1%) post-exercise, only

the group consuming fruit-infused water (made with apple, banana, and lemon) exhibited a significantly lighter urine color, suggesting better hydration efficiency Ali *et al.* (2018) [2]. The presence of natural electrolytes and nutrients in the infused water likely aided in maintaining fluid balance and preventing early dehydration, highlighting its potential as a more effective and enjoyable hydration aid than plain water.

Beyond hydration, flavoured water is recognized for its antioxidant potential. The infusion of plant-based materials releases phytochemicals that scavenge free radicals, helping to mitigate oxidative stress. A study conducted in 2019 emphasized that antioxidants from infused beverages can reduce the risk of chronic diseases such as cardiovascular disorders, diabetes, and obesity, due to their anti-inflammatory and anti-diabetic effects. As these beverages are typically made without synthetic additives, they offer a clean-label, low-calorie alternative to conventional soft drinks and commercial energy beverages. Thiagarajah *et al.* (2019) [24].

A study conducted in 2021 a comparative study on Fuji apple and Valencia orange-infused water, showing that both fruit varieties significantly enhanced the total phenolic content (TPC) and antioxidant activity, particularly when peels were included during infusion Ariyawansa and Ramanathan (2021) [4]. The presence of flavonoids and polyphenols in fruit peels contributed to higher free radical scavenging activity, and longer infusion durations were correlated with increased antioxidant extraction. These findings reinforce the value of infused water as a natural protective beverage against oxidative stress and related health conditions.

Flavoured water has also demonstrated behavioural health benefits, especially in promoting healthy beverage choices among children. A study conducted in 2022 was an intervention study among parents of preschool-aged children to assess the acceptability and impact of introducing fruit-infused water (FIW) in the household Quelly *et al.* (2022) [19]. The results revealed a reduction in sugar-sweetened beverage (SSB) intake and overall calorie consumption among children. Additionally, parents reported feeling more informed and confident in offering healthier drink options, suggesting that FIW can serve as a practical public health strategy for reducing obesity risk early in life.

Emerging research has also identified the therapeutic potential of flavoured water in managing specific conditions. For instance, pineapple-infused water, particularly using the cayenne variety, has shown uric acid-lowering properties beneficial in managing gout arthritis. A study conducted in 2024 attributed this effect to the synergistic action of vitamin C, flavonoids, and the enzyme bromelain Kadafi and Nelyanti (2024) [10]. Vitamin C enhances uric acid excretion through the kidneys, flavonoids inhibit xanthine oxidase activity involved in uric acid formation, and bromelain provides anti-inflammatory support, reducing joint swelling. The study observed a significant decline in uric acid levels post-consumption, positioning pineapple-infused water as a promising non-pharmacological approach for gout management.

In summary, flavoured infused waters not only support hydration but also deliver a spectrum of health benefits ranging from antioxidant and anti-inflammatory effects to disease prevention and metabolic regulation. Their versatility, palatability, and functional advantages make them an ideal component of a health-conscious lifestyle across diverse age groups and physiological needs.

4. Chronological Development of Functional Beverages

4.1 Historical Emergence

Flavoured infused water emerged as a response to growing health concerns over sugary beverages. Initially, simple fruit-infused waters gained popularity for their refreshing taste and minimal caloric content. Over time, the category evolved to include functional ingredients like vitamins, minerals, and adaptogens, reflecting a shift toward wellness-oriented hydration Panou and Karabagias (2025) [16].

4.2 Market Evolution and Functional Positioning

The functional beverage sector has expanded rapidly, with flavoured water positioned as a low-calorie, nutrient-enhanced alternative. Its appeal lies in combining hydration with targeted health benefits such as immunity support, digestive wellness, and cognitive enhancement Kaur *et al.*, (2024) [11].

4.3 Nutritional Composition

Modern infused waters often contain purified water enriched with micronutrients (e.g., vitamin C, magnesium), antioxidants (e.g., polyphenols), and plant-based extracts. These additions aim to enhance physiological functions while maintaining clean-label standards Nazhand *et al.*, (2020) [14].

4.4 Functional Additives and Bioactivity

Ingredients like ginger, turmeric, hibiscus, and ashwagandha are increasingly used for their anti-inflammatory, adaptogenic, and digestive properties. Their inclusion aligns with consumer demand for beverages that offer both taste and therapeutic value Panou and Karabagias (2025) [16].

4.5 Health Benefits and Scientific Validation

Functional infused waters have shown potential in improving hydration status, reducing oxidative stress, and supporting gut microbiota when fortified with prebiotics or probiotics. Studies suggest that beverages containing L-theanine, magnesium, or vitamin D3 may also aid in relaxation and sleep quality (Nazhand *et al.* 2020; Nazhand *et al.* 2022) [14, 15].

4.6 Consumer Preferences and Sensory Trends

Flavour profiles such as lemon, berry, and tropical blends dominate consumer preferences. Sensory expectations include refreshing taste, low sweetness, and minimal bitterness. These preferences are shaped by demographic factors such as age, health status, and education level (An, Du, & Wang, 2022) [3].

4.7 Packaging and Sustainability

Eco-conscious consumers are driving demand for sustainable packaging solutions like aluminium bottles and biodegradable materials. This trend is particularly strong among Gen Z and millennials, who associate environmental responsibility with brand credibility Kaur *et al.*, (2024) [11].

4.8 Regulatory and Labelling Considerations

Compliance with FSSAI and international standards is essential for functional water products. Accurate labelling of nutrient content and health claims is critical to avoid

misleading consumers and ensure product integrity Panou and Karabagias (2025) [16].

4.9 Market Dynamics and Growth Projections

The global functional water market is projected to grow at a CAGR of 7.75% through 2032, driven by innovation in formulation and rising health awareness. Strategic collaborations and product diversification are key drivers of market expansion Kaur *et al.*, (2024) [11].

4.10 Future Outlook

Emerging trends include personalized hydration, cognitive support blends, and collagen-infused waters. With increasing scientific validation and consumer education, flavoured infused water is expected to remain a cornerstone of functional beverage innovation Nazhand *et al.*, (2022) [15].

5. Consumer Preference for Flavoured Water

Consumer interest in flavoured and infused water has increased significantly, driven by a combination of health awareness, sensory appeal, and a shift away from sugar-sweetened beverages. As modern consumers demand beverages that offer both hydration and added functional benefits, understanding their preferences is essential for optimizing product development and marketing strategies.

From a nutritional and safety perspective, mineral content in flavoured water is a growing area of interest. A study conducted in 2009 analysed various commercial flavoured water samples and found them to contain higher levels of key macro-minerals such as potassium and sodium, along with trace elements like iron and copper, compared to natural water Barroso *et al.* (2009) [7]. These findings underscore the need for transparent labelling and consumer education, particularly as consumers increasingly seek beverages that support functional hydration and overall wellness.

Taste, aroma, and visual appeal play a pivotal role in consumer acceptance of infused water. A study conducted in 2019 carried out a sensory evaluation of different infused water formulations containing lemon, strawberry, and mint Surati *et al.* (2019) [23]. Their results showed that the combination of 5 lemon slices, 3 strawberries, and 5 mint leaves (Sample B) was most preferred for its balanced flavour, fresh aroma, and appealing colour. This study highlights the importance of ingredient synergy not only for nutritional enhancement but also for meeting consumer expectations related to refreshment and enjoyment.

A study conducted in 2022 further investigated consumer expectations for flavoured water and reported that individuals prefer it to be refreshing, thirst-quenching, mildly sweet, and naturally flavoured—especially with familiar fruits such as lemon, berry, and lime An *et al.* (2022) [3]. Functional attributes like the presence of vitamins, minerals, and antioxidants were also valued. Interestingly, consumer preferences were influenced by demographic factors such as age, education level, and self-perceived health status, suggesting the importance of consumer segmentation for successful product positioning.

Flavoured infused water has also gained traction as a healthier beverage alternative for children, particularly as a means of reducing sugar-sweetened beverage (SSB) intake. A study conducted in 2022 involved an intervention study targeting parents of preschool-aged children and found that with access to education, recipes, and preparation tools, parents were not only able to prepare fruit-infused water at home but also reported greater confidence and willingness to offer it to their children Quelly *et al.* (2022) [19]. This intervention resulted in a measurable decrease in SSB consumption and improved hydration habits, demonstrating the feasibility of promoting FIW as a family-friendly, health-conscious choice.

In the post-pandemic era, consumer interest has increasingly shifted toward beverages that support natural immunity and overall well-being. A study conducted in 2023 noted that community-based education programs significantly enhanced consumer knowledge and practical skills in preparing infused water Kurniawan *et al.* (2023) [12]. Participants appreciated its simplicity, affordability, and immune-boosting potential—especially due to its lack of added sugars or synthetic ingredients. This trend reflects a broader move toward DIY, natural health beverages, particularly among populations seeking clean-label alternatives to processed drinks.

In summary, consumer preferences for flavoured water are shaped by a blend of sensory, nutritional, and functional expectations. The beverage's versatility, ease of preparation, and alignment with modern health values position it as a highly accepted and growing segment in the functional beverage market.

6. Sensory Perception and Quality Enhancement Techniques

Sensory perception is a crucial determinant of consumer acceptance in flavoured and infused water products. Attributes such as taste, aroma, colour, mouthfeel, and freshness directly influence consumer preferences and repeat purchases. Simultaneously, enhancing the functional and nutritional value without compromising sensory quality is key to successful product development. Research has shown that both ingredient composition and processing techniques, such as infusion time and fermentation, significantly affect the overall sensory and quality profile of these beverages.

In a detailed investigation on detox water, it was reported that total phenolic content (TPC) and total flavonoid content (TFC) increased significantly with longer soaking durations Ariyawansa and Ramanathan (2021) [4]. For a 25:75 apple: orange ratio, TPC rose from 74.72 µg GAE/ml at 0.5 hour to 189.03 µg GAE/ml at 8 hours, while TFC increased from 14.52 µg QE/ml to 32.14 µg QE/ml. Similar trends were noted in 50:50 and 75:25 combinations. These findings highlight how infusion duration directly influences antioxidant potential, which in turn affects perceived freshness, mouthfeel, and health appeal. Moreover, the use of fruit peels and different ratios also contributed to varied sensory intensities, adding complexity to flavour perception.

In a related context, a 2024 study examined a therapeutic formulation of pineapple-infused water for managing uric acid in gout patients Kadafi and Nelyanti (2024) [10]. While the clinical objective was to assess functional outcomes, the formulation emphasized ease of preparation, palatability, and pleasant sensory attributes, including mild tartness and natural sweetness. This reinforces the dual role of fruit-derived bioactives—like bromelain and vitamin C—not only in promoting health but also in enhancing consumer satisfaction through flavour, aroma, and mouthfeel.

Another study conducted in 2025 assessed lemon cui (*Citrus microcarpa*) infused with other ingredients like watermelon,

cucumber, and dates under different extraction durations Handayani *et al.* (2025) [9]. The combination of lemon cui and watermelon infused for 4 hours yielded the highest levels of vitamin C, antioxidant activity, and total phenols, along with an optimal pH that was most acceptable in sensory evaluation. The findings confirm that ingredient synergy and optimized infusion time can significantly enhance both the nutritional and sensory appeal, making the final beverage refreshing and functionally potent.

Overall, sensory enhancement techniques such as optimizing infusion time, selecting bioactive-rich ingredients, and employing controlled fermentation play a vital role in developing flavoured waters that are both nutritionally beneficial and organoleptically pleasing. As consumer interest shifts toward natural, health-promoting beverages, these quality optimization strategies are essential for market competitiveness and consumer retention.

7. Summary and Conclusion

Flavoured infused water has rapidly evolved into a preferred health-oriented beverage category due to its ability to combine hydration with nutritional, functional, and sensory benefits. This comprehensive review explored key dimensions of flavoured water including its formulation strategies, nutritional profile, health-promoting effects, consumer preferences, and quality enhancement techniques.

Water, being essential to human survival and physiological functioning, has been reimagined through the infusion of fruits, herbs, and botanicals, not only to enhance palatability but also to boost its micronutrient and antioxidant content. Studies have consistently reported that flavoured waters contain elevated levels of essential minerals (such as potassium, sodium, and magnesium), polyphenols, flavonoids, and vitamin C, which contribute significantly to the body's antioxidant defence and immune function.

Functionally, fruit-and herb-infused waters have demonstrated health benefits ranging from improved hydration during exercise, to reduction in oxidative stress, better uric acid management, and potential anti-diabetic and anti-inflammatory effects. These outcomes are further enhanced when bioactive-rich ingredients are used and infusion parameters (like duration and temperature) are optimized.

The consumer acceptance of these beverages hinges heavily on flavour, aroma, appearance, and health perception. Research shows that a growing number of consumers, including parents and children, are inclined to replace sugar-sweetened beverages with infused water, especially when made available with proper education and preparation resources. Post-pandemic health awareness has further catalysed a shift toward natural, functional, and DIY beverage options.

In terms of sensory optimization and quality, variables such as ingredient combinations, fermentation duration, soaking time, and sugar types play a pivotal role. These parameters not only elevate the beverage's organoleptic appeal but also its antioxidant activity and shelf stability, making them more viable for commercialization.

In conclusion, flavoured infused water represents a promising intersection between functionality and sensory appeal, offering an accessible, health-promoting alternative to conventional soft drinks. With increasing demand for clean-label, low-calorie, and nutrient-rich beverages, there lies ample opportunity for innovation in formulation, functional ingredient incorporation, and consumer education. Future research should continue to explore novel bioactive sources, preservation methods, and sustainable production models to further enhance the commercial and therapeutic potential of flavoured water.

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9. References

1. Affno Z, Basri AM, Nore BF. Formulation of naturally flavoured mineral water with *Curcuma longa*. ASEAN Journal on Science and Technology for Development. 2024;40:1-8.
2. Ali MA, Rahayu S, Indardi N, Anggita GM, Soraya F, Rustadi T, *et al.* Usage of fruit-infused water for prevention of dehydration due to endurance exercise. Jurnal Kesehatan Masyarakat. 2018;13:417-422.
3. An U, Du X, Wang W. Consumer expectation of flavoured water function, sensory quality, and sugar reduction, and the impact of demographic variables and woman consumer segment. Foods. 2022;11:1434-1445.
4. Ariyawansa GP, Ramanathan R. Antioxidative potential and phytochemical content of detox water. Advanced Journal of Graduate Research. 2021;10:41-50.
5. Armstrong LE, Johnson EC. Water intake, water balance, and the elusive daily water requirement. Nutrients. 2018;10:1928-1938.
6. Barroso MF, Plácido A, Correia-Sá L, Domingues VF, Oliveira MBPP, Delerue-Matos C. Total antioxidant capacity of flavoured waters. Academic Press. 2014;215-224.
7. Barroso MF, Silva A, Ramos S, Oliva-Teles MT, Delerue-Matos C, Sales MGF, *et al.* Flavoured versus natural waters: macromineral (Ca, Mg, K, Na) and micromineral (Fe, Cu, Zn) contents. Food Chemistry. 2009;116:580-589.
8. Haitami H, Ulfa A, Muntaha A. Kadar vitamin C jeruk sunkist peras dan infused water. Medical Laboratory Technology Journal. 2017;3:22-26.
9. Handayani T, Paneo Y, Nurhayati N. Chemical characteristics of lemon cui (*Citrus microcarpa*) infused water with various combinations of food materials and extraction time. International Conference on Religion, Science and Education. 2025;4:1303-1308.
10. Kadafi A, Nelyanti DA. Effect of infused water pineapple cayenne (*Ananas comosus* L. Merr) on reducing uric acid levels in patients with gout arthritis. Jurnal Citra Keperawatan. 2024;12:6-13.
11. Kaur R, Shekhar S, Prasad K. Functional beverages: Recent trends and prospects as potential meal replacers. Food Materials Research. 2024;4:e006. https://doi.org/10.48130/fmr-0023-0041
12. Kurniawan K, Marfu'ah N, Al Hasanah F, Rabbaniyah MA, Sawitri SB. Use of infused water healthy drinks as body resistance with PKK managers of Bangak Sine Village Sragen. Jurnal Abdimas Kesehatan. 2023;1:10-15.
13. Lubis MM, Nurminah M, Lubis LM. Effect of soaking time of cocoa fruit peel and addition of citronella grass extract on quality characteristics of infused water. IOP Conference Series: Earth and Environmental Science. 2024;1352:012034.

14. Nazhand A, Souto EB, Lucarini M, Souto SB, Durazzo A, Santini A. Ready to use therapeutical beverages: Focus on functional beverages containing probiotics, prebiotics and synbiotics. Beverages. 2020;6(2):26. https://doi.org/10.3390/beverages6020026
15. Nazhand A, Souto EB, Lucarini M, Souto SB, Durazzo A, Santini A. Functional beverages: Composition, properties, and beneficial effects on human health. Beverages. 2022;11(2):40.
16. Panou A, Karabagias IK. Composition, properties, and beneficial effects of functional beverages on human health. Beverages. 2025;11(2):40.
17. Pérez-Rodríguez ML, López-Froilán R, Casado Á. Antioxidant capacity of commercial flavored waters. Advances in Food Science and Engineering. 2017;1:9-17.
18. Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. Nutrition Reviews. 2010;66:439-458.
19. Quelly SB, Eckhoff DO, Luzincourt G, Garcia J, Smith S. Feasibility of parents promoting fruit-infused water to reduce preschool children's sugar-sweetened beverage consumption. Nutrition and Health. 2022;28:291-296.
20. Refita K. Ketersediaan produk pangan mengandung kultur di situs belanja daring dan pengetahuan serta persepsi tentang probiotik pada mahasiswa di Jabodetabek. IPB Press. 2021. p. 1-82.
21. Sabira QAN, Suryani T. Glucose levels and organoleptic quality probiotic tepache of pineapple peel on variation of sugar and fermentation duration. International Conference on Biology Education, Natural Science, and Technology. 2023;1:348-355.
22. Sultan RA. Karakteristik minuman probiotik kombinasi sari buah nenas dan pepaya. Jurnal Pendidikan Teknologi Pertanian. 2022;8:37-46.
23. Surati S, Widiyanto SD, Qomariyah N, Wikandari RJ. Levels of minerals, vitamin and power received in drink infused water with diversification. Jurnal Riset Kesehatan. 2019;8:11-16.
24. Thiagarajah K, Ong MK, Teh LK, Lye HS. Plants infused water as preferred healthy drinks. In: Woodhead Publishing. 2019. p. 367-402.