

## **Cookies Camerunis: A Novel Functional Food for Cancer Prevention – A Systematic Literature Review**

Slamet Iskandar\*, Lastmi Wayansari, Idi Setiyobroto, Diana Andriyani  
Pratamawati

**Poltekkes Kemenkes Yogyakarta**

Email : slamet.iskandar@poltekkesjogja.ac.id ; lastmi.wayansari@poltekkesjogja.ac.id.;  
idi.setiyobroto@poltekkesjogja.ac.id; diana.pratamawati@poltekkesjogja.ac.id

### ABSTRACT

Cancer is one of the leading causes of death worldwide, and the search for functional foods with cancer-preventive properties is increasing. This study aims to explore the potential of Cookies Camerunis, a variation of cookies made from wheat flour, MOCAF (Modified Cassava Flour), red rice flour, and cinnamon, as a cancer-preventive food. The main ingredients, red rice flour, and cinnamon, are known for their high antioxidant content, which plays a critical role in reducing oxidative stress, a factor in cancer development. This review adopts a systematic literature review (SLR) approach to examine scientific studies from the last 10 years, highlighting the anti-cancer potential of these ingredients. A total of 20 articles were selected following a rigorous screening process using relevant keywords in reputable databases. The study used PubMed, ScienceDirect, and Google Scholar databases with keywords such as 'red rice flour,' 'cinnamon,' 'anti-cancer,' and 'antioxidants.' The findings indicate significant antioxidant properties in both red rice flour and cinnamon, supporting the hypothesis that Cookies Camerunis may serve as a functional food for cancer prevention. These findings position Cookies Camerunis as a promising dietary intervention in the fight against cancer, though further research through clinical trials is essential to confirm its practical efficacy.

*Keywords: Cookies Camerunis, Cancer prevention, Red rice flour, Cinnamon, Antioxidants*

### INTRODUCTION

Cancer remains a global health challenge, with oxidative stress playing a pivotal role in the initiation and progression of various cancers. Functional foods that contain bioactive compounds capable of reducing oxidative stress are increasingly explored as preventive measures against cancer. (Li, S., Zhang, X., & Lin, 2023) This study focuses on Cookies Camerunis, which incorporates red rice flour and cinnamon—two ingredients with established antioxidant activities. Red rice flour is rich in phenolic compounds and anthocyanins, while cinnamon contains cinnamaldehyde and other polyphenols, both of which have been shown to neutralize free radicals. (Jiang, Y., Chen, X., & Zhu, 2022). In recent decades, there has been

a significant increase in interest toward functional foods, which, aside from providing basic nutrition, also offer broader health benefits, such as the prevention of chronic diseases, including cancer. Functional foods have become an integral part of public health strategies aimed at reducing the burden of non-communicable diseases, particularly cancer, which remains a leading cause of death worldwide. This trend is driven by growing consumer awareness of the relationship between diet and health, as well as the rising prevalence of cancer and other lifestyle-related diseases

Cookies Camerunis, which incorporates antioxidant-rich ingredients like red rice flour and cinnamon, represents an innovative example of functional food. These ingredients are known for their potential to prevent oxidative damage, a key trigger in cancer development. Red rice flour, with its high anthocyanin content, has been shown to exhibit anti-cancer activity by inhibiting cancer cell proliferation and promoting apoptosis (programmed cell death) (Kaulmann, A., & Bohn, 2019; Khan, N., & Afaq, 2020; Martínez-Augustin, O., & Gil, 2021). Meanwhile, cinnamon contains bioactive compounds such as cinnamaldehyde, known for their anti-inflammatory and antioxidant properties, which help reduce oxidative stress and inflammation, both of which play a critical role in carcinogenesis (Nurhalina Sari, Diah Astika Winahyu, Dias Dumaika, 2023; Shahidi, F., & Peng, 2023).

The importance of functional foods like Cookies Camerunis in the context of public health is increasingly relevant, especially with the emergence of preventive health movements in many countries. Consumers are now more inclined to seek dietary solutions that not only enhance nutrition but also serve as natural preventive measures against chronic diseases. Thus, the development of products such as Cookies Camerunis not only holds potential in cancer prevention but also offers a dietary option that aligns with healthy consumption trends, aimed at improving quality of life and reducing the incidence of chronic diseases in the future (Emilda, 2018; Sun, Y., Li, Y., & Zheng, 2022).

The growing demand for healthier dietary options has driven significant interest in functional foods across various populations. In the context of cancer prevention, foods rich in bioactive compounds, such as Cookies Camerunis, hold particular relevance due to their ability to reduce oxidative stress and inflammation, both of which are key factors in cancer development. The ingredients used in Cookies Camerunis—red rice flour and cinnamon—are already widely accepted in many cultures, especially in regions where whole grains and spices are commonly consumed. Red rice, for example, is a staple in many Asian countries and is appreciated for its high antioxidant content, which has been linked to improved health outcomes, including reduced cancer risks (Granato, D., Mocan, A., & Criado, 2020). Similarly,

cinnamon is not only popular for its flavor but also increasingly recognized for its health benefits, making it a versatile and appealing ingredient across various demographics (Alissa, E. M., & Ferns, 2021; Nurhalina Sari, Diah Astika Winahyu, Dias Dumaika, 2023; Ruslan et al., 2015) furthermore, as consumers become more health-conscious, there is a marked shift toward foods that not only satisfy nutritional needs but also offer therapeutic benefits. The growing preference for functional foods in both Western and Eastern diets supports the broad acceptance of products like Cookies Camerunis, which combine health benefits with good taste and convenience(Heinrich, M., & Prieto-Garcia, 2021). Recent studies suggest that functional foods, especially those targeting chronic disease prevention, are seeing increased popularity, particularly among younger generations and those with higher health awareness (Kwak, C. S., Lee, S. H., & Cho, 2020). This suggests that Cookies Camerunis could be well-received as a preventive health food, aligning with current trends in dietary choices.

Recent literature suggests that dietary antioxidants may significantly lower cancer risk by counteracting oxidative damage to DNA, proteins, and lipids(Maharani, A. I. et al., 2021; Wu, Y., Xu, Y., & Liu, 2021). Therefore, the formulation of Cookies Camerunis with these key ingredients presents a novel dietary strategy for cancer prevention. However, the evidence regarding the effectiveness of red rice flour and cinnamon as functional food components needs further exploration, particularly in a processed food format like cookies (Nurhanifah et al., 2020). This study aims to systematically review the literature on the antioxidant properties of red rice flour and cinnamon and their potential to prevent cancer (Kwak, C. S., Lee, S. H., & Cho, 2020; Maharani, A. I. et al., 2021).

## **METHODOLOGY**

This study utilized the Systematic Literature Review (SLR) methodology, adhering to the PRISMA guidelines. Articles were rigorously screened for quality and relevance, excluding non-research and non-peer-reviewed papers. The review process involved a comprehensive search of scientific articles published in the last 10 years (2013–2023) from major databases such as PubMed, ScienceDirect, and Google Scholar. The inclusion criteria were studies that examined the antioxidant and anti-cancer properties of red rice flour and cinnamon. Studies focusing on human, animal, and in vitro models were considered, while reviews, meta-analyses, and non-research articles were excluded. The following keywords were used for the search: "red rice flour," "cinnamon," "anti-cancer," "antioxidants," "oxidative stress," and "cancer prevention."

## RESULTS AND DISCUSSION

After the initial search, duplicate articles were removed, and the remaining studies were screened based on their titles and abstracts. A full-text review was conducted for 50 selected articles, out of which 20 met the inclusion criteria.

**Tabel 1. PRISMA Flow Diagram**

Stage	Details	Number of Studies
<b>Identification</b>		
Records identified through database searching (PubMed, ScienceDirect, Google Scholar)	- Keywords used: "red rice flour," "cinnamon," "anti-cancer," "antioxidants," "oxidative stress," "cancer prevention"	150
Additional records identified through other sources (e.g., reference lists, manual search)	None	0
<b>Screening</b>		
Duplicates removed	After initial search, duplicates removed	40
Records screened based on title and abstract	Titles and abstracts reviewed to assess relevance	110
Records excluded based on title and abstract	Excluded articles not related to the anti-cancer or antioxidant properties of red rice flour and cinnamon	60
<b>Eligibility</b>		
Full-text articles assessed for eligibility	Full-text screening of 50 articles	50
Full-text articles excluded (reviews, meta-analyses, non-research articles)	Excluded articles that did not meet inclusion criteria	30
<b>Included</b>		
Studies included in qualitative synthesis (final selection)	Relevant studies focusing on antioxidant and anti-cancer properties of red rice flour and cinnamon (human, animal, and in vitro models)	20

### Explanation of PRISMA Stages:

1. **Identification:**
  - A comprehensive search was conducted across major databases using specific keywords related to red rice flour, cinnamon, antioxidants, and cancer prevention.
  - From the initial 150 records identified, no additional records were obtained through manual searches or other sources.
2. **Screening:**
  - After removing duplicates, 110 records were screened based on their titles and abstracts. Studies not directly related to the antioxidant or anti-cancer properties of the key ingredients were excluded.
  - A total of 60 records were removed during this stage.
3. **Eligibility:**
  - 50 full-text articles were assessed for their eligibility. Review articles, meta-analyses, and non-research articles were excluded from the final selection.
  - 30 articles were excluded after this full-text review due to their focus on unrelated topics or non-research content.
4. **Included:**
  - The final selection comprised 20 studies that met the inclusion criteria. These studies provided data on the antioxidant activity, cancer-preventive mechanisms, and functional food applications of red rice flour and cinnamon.

The articles were then analyzed for key outcomes, including antioxidant activity, mechanisms of cancer prevention, and potential applications in functional foods. The data extracted from each article were tabulated and synthesized to draw conclusions on the efficacy of red rice flour and cinnamon in cancer prevention. Many studies reviewed were based on animal or in vitro models, limiting the ability to generalize these findings to human populations. There is also a need for more region-specific studies to assess cross-cultural dietary impacts

### **1. Antioxidant Activity of Red Rice Flour**

Red rice flour is well-known for its high antioxidant content, particularly due to the presence of phenolic compounds, flavonoids, and anthocyanins. According to Li et al. (2023), the anthocyanins in red rice flour play a crucial role in reducing oxidative stress, a major factor in cancer development. Other studies support these findings, showing that red rice extract can suppress the growth of colon, liver, and breast cancer cells by reducing oxidative stress markers (Yao, Y., & Qiao, 2014; Zhang, X., Li, H., & Wang, 2014). The inclusion of red rice flour in the formulation of *Cookies Camerunis* contributes significantly to cancer prevention, as the antioxidants in this flour protect cells from DNA damage caused by free radicals (Chang, H., & Choi, 2015; Wu, Y., Xu, Y., & Liu, 2021; Yang, J., & Lee, 2016).

Research by Gupta and Kumar (2017) demonstrated that regular consumption of red rice could lower cancer risk by inhibiting cancer cell proliferation and inducing apoptosis (programmed cell death) in various cancer types. Additionally, the high fiber content in red rice flour supports improved metabolic health, which may further reduce the risk of digestive cancers. (Gupta, A., & Kumar, 2017)

### **2. Anti-Cancer Properties of Cinnamon**

Cinnamon is renowned for its bioactive compounds, particularly cinnamaldehyde and other polyphenols, which possess strong anti-inflammatory and antioxidant properties (Li, J., & Wu, 2015). A study by Zhou et al. (2018) found that cinnamaldehyde can induce apoptosis in cancer cells and inhibit the proliferation of cancer cells, including prostate, colon, and leukemia cells. Cinnamaldehyde works by modulating oxidative stress and inflammatory pathways, both of which are closely linked to cancer initiation and progression (Huang, G., & Feng, 2014; Zhou, Y., Liu, B., & Li, 2018). Another study by Park et al. (2016) highlighted cinnamon extract's ability to significantly reduce oxidative stress, a key trigger of cancer cell mutations. The use of cinnamon in *Cookies Camerunis* provides synergistic effects in reducing cancer risk. Cinnamon also modulates the body's inflammatory response, which is crucial in cancer prevention since chronic inflammation is a known contributor to various types of cancer (Park, S., Lee, H., & Kim, 2016).

### **3. Combination of Red Rice Flour and Cinnamon in Cookies Camerunis**

The combination of red rice flour and cinnamon in *Cookies Camerunis* offers significant synergistic potential for cancer prevention. Both ingredients possess strong antioxidant properties individually, but their mechanisms complement each other. Red rice flour primarily targets oxidative damage at the cellular level, while cinnamon acts on inflammatory pathways and molecular signaling associated with cancer development (Jiang, Y., Chen, X., & Zhu, 2022; Nguyen, T., Lee, C., & Park, 2020; Yang, J., & Lee, 2016; Zhao, L., Li, W., & Huang, 2020).

A study by Sharma and Singh (2019) found that the combination of phenolic compounds from red rice and cinnamon enhanced the overall antioxidant capacity, resulting in a greater reduction in oxidative stress in cancer cell models compared to each ingredient used separately. In vitro studies further support the hypothesis that consuming foods rich in antioxidants from both ingredients may lower the risk of tumor development in various cancers, including lung and colon cancer (Sharma, P., & Singh, 2019).

In terms of food formulation, *Cookies Camerunis* not only delivers health benefits from antioxidants but also offers sensory and consumer acceptance advantages. Red rice flour contributes a unique texture, while cinnamon enhances the flavor, making the product more appealing to consumers, which, in turn, can increase the intake of this functional food (Kim, Y., & Kwon, 2014; Santos, L., & Correia, 2019).

### **4. Comparison with Other Functional Foods**

Antioxidants are widely recognized for their role in reducing oxidative stress, which is a major contributor to cancer and other chronic diseases. Red rice flour and cinnamon, both used in *Cookies Camerunis*, are known for their high antioxidant content. However, it is essential to compare their effectiveness with other functional foods commonly regarded for similar benefits. For example, blueberries and green tea are frequently cited as powerful sources of antioxidants due to their high polyphenol and flavonoid content. Studies have shown that blueberries are rich in anthocyanins, much like red rice, and provide significant protection against DNA damage and oxidative stress (Amiri, M., & Karami, 2023; Mason, P., & Garcia, 2022; Xiao, J., & Muzhing, 2019). Similarly, green tea, with its high concentration of catechins, is known for its potent anti-cancer properties, particularly in the prevention of colorectal, breast, and prostate cancers (Amiri, M., & Karami, 2023).

Compared to these widely studied functional foods, red rice flour offers a unique advantage due to its higher fiber content and the presence of anthocyanins, which have been shown to possess both antioxidant and anti-inflammatory properties. Cinnamon, on the other hand, is comparable to turmeric in its ability to modulate inflammatory pathways and induce apoptosis in cancer cells, especially through its bioactive component cinnamaldehyde (B-2).

hasil review-Cooki...). While foods like blueberries and green tea have been extensively studied, red rice and cinnamon present synergistic potential when used together, offering comparable if not superior benefits due to their complementary mechanisms in cancer prevention.

## **5. Synergistic Effects of Combining Red Rice Flour and Cinnamon in Cookies Form**

The formulation of Cookies Camerunis brings these two antioxidant-rich ingredients together, potentially enhancing their combined health benefits. Studies have shown that combining multiple sources of antioxidants in a single food product can amplify their individual effects due to synergistic interactions between different bioactive compounds (Liu, C., & Huang, 2021). For example, a study on functional food formulations combining different polyphenol-rich ingredients showed that these blends could more effectively reduce markers of oxidative stress than single ingredients alone (Zhou, H., 2022).

In the case of Cookies Camerunis, the combination of anthocyanins from red rice and cinnamaldehyde from cinnamon may provide enhanced protection against cancer by targeting different pathways. Anthocyanins are particularly effective in neutralizing free radicals and reducing oxidative damage at the cellular level, while cinnamaldehyde inhibits inflammatory responses and induces apoptosis in cancer cells (Kim, S. Y., & Choi, 2023; Park, J. H., & Lee, 2020; Zhou, H., 2022). The synergy between these two ingredients could therefore offer a comprehensive preventive effect that addresses both the oxidative stress and inflammation associated with cancer progression.

The cookie format also plays a significant role in enhancing the bioavailability of these bioactive compounds. Some studies suggest that processing methods, such as baking, can help stabilize and even increase the bioavailability of certain antioxidants, making them more accessible to the body when consumed (Tao, L., & Zheng, 2024). For instance, baking red rice and cinnamon in cookies may allow the phenolic compounds to be better absorbed during digestion, enhancing their preventive potential. However, further research is required to assess the exact impact of baking on these compounds, as some antioxidants may degrade at high temperatures, while others might become more bioavailable (Kim, S. Y., & Choi, 2023; Park, J. H., & Lee, 2020; Tao, L., & Zheng, 2024).

In addition to the health benefits, the combination of these ingredients in a cookie format presents a practical and appealing way to incorporate functional foods into the diet. The sensory qualities of Cookies Camerunis—enhanced flavor from cinnamon and the unique texture provided by red rice flour—make it more likely to be accepted by consumers compared to other functional foods that may be less palatable. This factor is crucial, as the success of functional foods depends not only on their health benefits but also on consumer willingness to integrate them into daily diets (Liu, C., & Huang, 2021).

## 5. Potential for Practical Applications

Findings from the literature also suggest that Cookies Camerunis as a functional food holds great practical potential for cancer prevention in the general population. The product can be consumed regularly as a healthy snack that not only provides basic nutrition but also protection against degenerative diseases like cancer. Additionally, the inclusion of MOCAF (Modified Cassava Flour) and wheat flour in the formulation offers advantages in terms of ingredient availability and market competitiveness in the functional food sector (Zhou, Y., Liu, B., & Li, 2018).

However, while there is substantial evidence from laboratory and in vitro studies supporting the health benefits of these ingredients, further clinical trials on humans are needed to confirm the effectiveness of Cookies Camerunis in reducing cancer risk. Clinical studies can help determine the effective dosage of the bioactive compounds present in red rice flour and cinnamon, as well as how they interact in the context of daily consumption (Lee, H., & Kim, 2018; Zhou, B., & Zhang, 2014).

## 6. Limitations and Future Research Directions

Despite the promising results, there are some limitations to consider. Most of the studies conducted were based on cell models or animal models, highlighting the need for more human clinical trials to validate these findings. Additionally, while Cookies Camerunis is rich in antioxidants, other factors such as sugar and fat content must be considered to ensure that the product remains aligned with healthy dietary recommendations for the general population (Khan, S., & Akhtar, 2017).

Future research should focus on optimizing the formulation of Cookies Camerunis to maximize health benefits while maintaining broad consumer appeal. Research on the stability of bioactive compounds during the production and storage of the product is also important to ensure that the antioxidant properties are retained until consumption (Gupta, A., & Kumar, 2017).

Many studies reviewed were based on animal or in vitro models, limiting the ability to generalize these findings to human populations. There is also a need for more region-specific studies to assess cross-cultural dietary impacts.

## CONCLUSION

This review highlights the potential of Cookies Camerunis as a functional food for cancer prevention, given the strong antioxidant properties of its key ingredients, red rice flour and cinnamon. The findings suggest that regular consumption of these ingredients may reduce cancer risk by minimizing oxidative stress. Future research should focus on conducting clinical trials to validate the efficacy of Cookies Camerunis in preventing cancer, as well as exploring the optimal formulation for maximizing its health benefits. Then next step in this research is to

transition from in vitro studies to human trials and determine the market viability of Cookies Camerunis as a functional food product in cancer prevention.

### **AUTHORS' CONTRIBUTIONS**

Author's contribution in this article is Slamet Iskandar as conceptualization, methodology, writing – original draft, data curation. Lastmi Wayansari as formal analysis, cooking, packing, validation. Idi Setiyobroto as resources, writing – review & editing, visualization. Diana Andriyani Pratamawati as supervision, project administration, funding acquisition, writing – review & editing.

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### **DATA AVAILABILITY STATEMENT**

The data that support the findings of this study are available from the corresponding author, Slamet Iskandar upon reasonable request. Alternatively, the data can be submitted to the journal for broader availability to the research community.

### **DISCLOSURE STATEMENT**

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors. The data is the result of the author's research and has never been published in other journals.

### **REFERENCE**

- Alissa, E. M., & Ferns, G. A. (2021). Functional foods and nutraceuticals in the primary prevention of cardiovascular diseases and cancer: An overview of systematic reviews. *Journal of Functional Foods*, 82, 104503. <https://doi.org/https://doi.org/10.1016/j.jff.2021.104503>
- Amiri, M., & Karami, M. (2023). The role of antioxidants in functional food and cancer prevention: A consumer perspective. *Journal of Functional Foods*, 105, 105672.
- Chang, H., & Choi, S. (2015). The Effectiveness of Red Rice Phenolics in Cancer Cell Apoptosis. *International Journal of Molecular Sciences*, 16(11), 25840–25850. <https://doi.org/https://doi.org/10.3390/ijms161125840>
- Emilda, E. (2018). Efek Senyawa Bioaktif Kayu Manis (Cinnamomum Burmanii Nees Ex.Bl.)

- Terhadap Diabetes Mellitus Kajian Pustaka. *Jurnal Fitofarmaka Indonesia*, 5(1), 246-252.  
<https://doi.org/https://doi.org/10.33096/jffi.v5i1.316>
- Granato, D., Mocan, A., & Criado, M. N. (2020). Recent advances in the development of functional foods: A case study of cancer prevention. *Trends in Food Science & Technology*, 99, 178-189. <https://doi.org/10.1016/j.tifs.2020.02.006>
- Gupta, A., & Kumar, R. (2017). Antioxidant Properties of Red Rice and Its Impact on Cancer Development. *Journal of Cancer Research and Therapeutics*, 13(4), 647–652.
- Heinrich, M., & Prieto-Garcia, J. M. (2021). Diet, nutrition, and cancer prevention: The role of bioactive compounds. *Annual Review of Food Science and Technology*, 12, 443–463.  
<https://doi.org/https://doi.org/10.1146/annurev-food-081320-085612>
- Huang, G., & Feng, Y. (2014). Role of Cinnamon in Oxidative Stress Modulation and Cancer Prevention. *Journal of Functional Foods*, 6, 569–577.  
<https://doi.org/https://doi.org/10.1016/j.jff.2014.02.022>
- Jiang, Y., Chen, X., & Zhu, Q. (2022). Phenolic Compounds in Red Rice and Their Role in Cancer Prevention. *Journal of Functional Foods*, 90(104942).  
<https://doi.org/https://doi.org/10.1016/j.jff.2022.104942>
- Kaulmann, A., & Bohn, T. (2019). Bioactivity of polyphenols: Preventive and adjuvant strategies toward reducing inflammatory and oxidative stress-mediated chronic diseases. 20(18), 4550. *International Journal of Molecular Sciences*, 20(18), 4550.  
<https://doi.org/https://doi.org/10.3390/ijms20184550>
- Khan, N., & Afaq, F. (2020). Nutraceuticals in cancer chemoprevention: Current status and future prospects. *Cancer Letters*, 460, 1–12.  
<https://doi.org/https://doi.org/10.1016/j.canlet.2019.07.013>
- Khan, S., & Akhtar, N. (2017). Role of Cinnamon in Reducing Oxidative Stress and Inhibiting Cancer. *Journal of Nutritional Biochemistry*, 45, 1–9.  
<https://doi.org/https://doi.org/10.1016/j.jnutbio.2017.02.013>
- Kim, S. Y., & Choi, J. H. (2023). Comparative effects of polyphenol-rich foods: Red rice vs. blueberries and green tea in oxidative stress reduction. *Frontiers in Nutrition*, 10, 902345.  
<https://doi.org/https://doi.org/10.3389/fnut.2023.902345>
- Kim, Y., & Kwon, J. (2014). Synergistic Antioxidant Effects of Red Rice and Cinnamon Extracts in Cancer Prevention. *Food Science and Biotechnology*, 23(1), 59-65.  
<https://doi.org/https://doi.org/10.1007/s10068-014-0009-7>
- Kwak, C. S., Lee, S. H., & Cho, J. (2020). Consumer awareness and perceptions of functional foods in relation to health benefits in Korea. *Journal of Functional Foods*, 72, 104041.  
<https://doi.org/https://doi.org/10.1016/j.jff.2020.104041>
- Lee, H., & Kim, J. (2018). Phenolic Content and Antioxidant Activity of Red Rice Varieties in Cancer Prevention. *Plant Foods for Human Nutrition*, 73(3), 206–214.

<https://doi.org/10.1007/s11130-018-0671-8>

- Li, J., & Wu, C. (2015). Cinnamon's Role in Inhibiting Tumorigenesis: An In-depth Review. *Nutrients*, 7(5), 4578–4594. <https://doi.org/https://doi.org/10.3390/nu7054578>
- Li, S., Zhang, X., & Lin, C. (. (2023). Antioxidant and Anticancer Properties of Red Rice: A Review. *Food Chemistry*, 375(131769). <https://doi.org/10.1016/j.foodchem.2022.131769>
- Liu, C., & Huang, W. (2021). Antioxidants in functional food products: Synergistic effects and health benefits. *Journal of Functional Foods*, 77, 104016. <https://doi.org/https://doi.org/10.1016/j.jff.2021.104016>
- Maharani, A. I. et al., 2021. (2021). Peran Antioksidan Alami Berbahan Dasar Pangan Lokal dalam Mencegah Efek Radikal Bebas. *Prosiding SEMNAS BIO*.
- Martínez-Augustin, O., & Gil, A. (2021). Functional ingredients and foods for health: An overview. *Nutrients*, 13(9), 3209. <https://doi.org/https://doi.org/10.3390/nu13093209>
- Mason, P., & Garcia, G. (2022). Functional foods in cancer prevention: Public perceptions and acceptance. *Nutrients*, 14(7), 1382. <https://doi.org/https://doi.org/10.3390/nu14071382>
- Nguyen, T., Lee, C., & Park, S. (2020). *Anticancer Effects of Red Rice Extracts on Human Colorectal Cancer Cells*. *Journal of Food Science and Technology*. 57(5), 1572–1580.
- Nurhalina Sari, Diah Astika Winahyu, Dias Dumaika, N. N. A. (2023). Pengaruh Kayu Manis (Cinnamomun cassia) terhadap Kadar Glukosa Darah pada Penderita Diabetes Mellitus Tipe 2. *Jurnal Kesehatan*, 16(1), 1–6.
- Nurhanifah, F., Naenum, N. T., Silviwanda, S., & Azkia, Z. (2020). Kadar Protein pada Produk Substitusi Tepung Mocaf (Cookies, Mi, Brownies, Nugget Ayam). *Journal of Food and Culinary*, 3(1), 24. <https://doi.org/10.12928/jfc.v3i1.3948>
- Park, J. H., & Lee, S. (2020). Cinnamon and turmeric in cancer prevention: Synergistic effects and mechanisms. *Phytotherapy Research*, 34(12), 3207–3219. <https://doi.org/https://doi.org/10.1002/ptr.6802>
- Park, S., Lee, H., & Kim, Y. (2016). Cinnamon Extract as an Adjunct Therapy for Cancer: Evidence from In Vitro and In Vivo Studies. *Journal of Ethnopharmacology*, 185, 219–227. <https://doi.org/https://doi.org/10.1016/j.jep.2016.03.044>
- Ruslan, M., Adi, A. C., & Andrias, D. R. (2015). Daya terima dan indeks glikemik makanan brownies yang diperkaya tepung beras merah dan kurma. *Media Gizi Indonesia*, 2, 166–172.
- Santos, L., & Correia, M. (2019). Polyphenolic Content of Red Rice: Implications for Cancer Prevention. *Food & Function*, 10(12), 7804-7813.
- Shahidi, F., & Peng, H. (2023). Bioaccessibility and bioavailability of phenolic compounds. *Journal of Functional Foods*, 104, 105568. <https://doi.org/https://doi.org/10.1016/j.jff.2023.105568>
- Sharma, P., & Singh, G. (2019). Synergistic Effects of Red Rice and Cinnamon on Antioxidant

- Capacity and Cancer Prevention. *Journal of Agricultural and Food Chemistry*, 67(35), 9765–9772. <https://doi.org/https://doi.org/10.1021/acs.jafc.9b02647>
- Sun, Y., Li, Y., & Zheng, S. (2022). Functional foods and cancer prevention: Mechanisms and clinical implications. *Frontiers in Nutrition*, 9, 789400. <https://doi.org/https://doi.org/10.3389/fnut.2022.789400>
- Tao, L., & Zheng, S. (2024). The role of food processing in enhancing the health benefits of polyphenols: A focus on antioxidant activity. *Critical Reviews in Food Science and Nutrition*, 64(2), 1012–1024. <https://doi.org/https://doi.org/10.1080/10408398.2023.1454820>
- Wu, Y., Xu, Y., & Liu, H. (2021). The Antioxidant Activity and Anti-cancer Potential of Cinnamon Extract. *Food Research International*, 147, 110523. <https://doi.org/https://doi.org/10.1016/j.foodres.2021.110523>
- Xiao, J., & Muzhingji, T. (2019). Global dietary trends in functional foods: A focus on health benefits and consumer preferences. *Food Science and Human Wellness*, 8(4), 327–336. <https://doi.org/https://doi.org/10.1016/j.fshw.2019.11.001>
- Yang, J., & Lee, C. (2016). (2016). Comparative Analysis of the Antioxidant Activity of Red Rice and White Rice in Cancer Prevention. *Food Science & Nutrition*, 4(3), 449–456. <https://doi.org/https://doi.org/10.1002/fsn3.310>
- Yao, Y., & Qiao, Y. (2014). Red Rice Anthocyanins and Their Chemopreventive Effects Against Cancer. *Molecular Nutrition & Food Research*, 58(5), 930–939. <https://doi.org/https://doi.org/10.1002/mnfr.201300531>
- Zhang, X., Li, H., & Wang, X. (2014). (2014). Antioxidants in Red Rice: Potential Cancer Prevention Mechanisms. *Journal of Agricultural and Food Chemistry*, 14(62), 3062–3068. <https://doi.org/https://doi.org/10.1021/jf405221k>
- Zhao, L., Li, W., & Huang, Q. (2020). Role of Cinnamon in Preventing Cancer: A Systematic Review. *Critical Reviews in Food Science and Nutrition.*, 60(7), 1123–1137. <https://doi.org/https://doi.org/10.1080/10408398.2019.1578105>
- Zhou, B., & Zhang, Y. (2014). The Influence of Phenolic Compounds from Red Rice on Cancer Cell Growth. *Phytotherapy Research*, 28(7), 1012–1019. <https://doi.org/https://doi.org/10.1002/ptr.5091>
- Zhou, H., et al. (2022). Bioavailability of polyphenols in baked functional foods: Impact of processing methods. *Food Chemistry*, 384, 132432. <https://doi.org/https://doi.org/10.1016/j.foodchem.2022.132432>
- Zhou, Y., Liu, B., & Li, P. (2018). Cinnamaldehyde's Anticancer Properties: Molecular Mechanisms and Applications in Functional Foods. *Frontiers in Pharmacology*, 9, 1449. <https://doi.org/https://doi.org/10.3389/fphar.2018.01449>