



Systematic Review

The Effect of Red Bean Extract (*Phaseolus vulgaris L. sp*) on Systemic Lupus Erythematosus (SLE) from Obstetrics and Gynecology Perspective: A Systematic Review

Mukhammad Nooryanto¹, Chynthea Paramitha Dewi^{1*}

Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Brawijaya/ dr. Saiful Anwar General Hospital, Malang, East Java, Indonesia

ARTICLE HISTORY

Received: 24 May 2025
Revised: 12 July 2025
Accepted: 17 October 2025

CORRESPONDING AUTHOR*

Chynthea Paramitha Dewi
chyntheapd@gmail.com
Department of Obstetrics and Gynecology,
Faculty of Medicine, Universitas Brawijaya/
dr. Saiful Anwar General Hospital, Malang,
East Java, Indonesia

KEYWORDS

Systemic Lupus Erythematosus (SLE);
Red Bean Extract; *Phaseolus vulgaris L.*;
Anti-Inflammatory; Antioxidant Effect



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>)

ABSTRACT

Introduction: Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune disease predominantly affecting women of reproductive age, with significant morbidity and mortality. Emerging evidence suggests that diet may modulate disease activity, and red bean (*Phaseolus vulgaris L.*), rich in bioactive compounds, exhibits potential anti-inflammatory and antioxidant effects.

Material and Methods: A systematic literature review was performed using MeSH terms and relevant keywords related to SLE and red bean extract (*Phaseolus vulgaris L.*), with searches conducted across PubMed, Scopus, ScienceDirect, ResearchGate, and Google Scholar for studies published between 2013 and November 2023, followed by structured title, abstract, and full-text screening based on predefined criteria.

Results: A total of 696 records were initially identified, of which 423 duplicates were removed. After title and abstract screening, 210 articles were assessed, and 21 full-text articles were reviewed. Eleven studies were excluded due to irrelevant outcomes, inappropriate study design, or language restrictions. Ten studies were included in the qualitative synthesis. The findings suggest that bioactive components of red beans may contribute to reduced inflammatory responses and improved clinical manifestations of SLE. Dietary interventions involving red bean consumption demonstrated potential benefits, particularly for women with SLE who are planning pregnancy.

Conclusion: Nutritional therapy may serve as an effective adjunct in the management of SLE, with red bean-based dietary interventions showing potential to reduce disease activity. Nonetheless, robust experimental and clinical studies are essential to validate their efficacy and inform evidence-based clinical recommendations.

Cite this as: Nooryanto M., Dewi CP. (2025) The Effect of Red Bean Extract (*Phaseolus vulgaris L. sp*) on Systemic Lupus Erythematosus (SLE) from Obstetrics and Gynecology Perspective: A Systematic Review. *Asian J Heal Res.* 4 (3): 85–91. doi: <https://doi.org/10.55561/ajhr.v4i3.254>

INTRODUCTION

Systemic Lupus Erythematosus (SLE) is a multifaceted autoimmune disease that presents numerous challenges for the individual affected, their family, and healthcare providers, characterized by a complex origin and a wide range of clinical symptoms. [1–5]. This autoimmune disease affects both of internal organs and skin, causing dysfunction of the patients numerous organs and systems, and has negative impact on the mental health condition, contributing to lowering their self-confidence. The complexity and diversity of

this extraordinary and difficult disorder led to the creation of 11 criteria, of which 4 must be met to officially diagnose SLE [6–9].

SLE can affect human in any aged, although mainly affects women in childbearing age with high mortality rate. The incidence rate in women diagnosed with SLE is higher than in men. Hormonal factors are recognized as a major risk factor for SLE in women [8,10]. The incidence of SLE varies globally, with North America experiencing the highest rate at 23.2 per 100,000 person-years [11–14]. Although the data of SLE in Indonesia is uncertain, based on data from the Hospital Information

System (SIRS), in 2016 there were 2.166 inpatient diagnosed with lupus, of which 550 patients died [8,10].

Seeing that the pathogenesis of SLE has not yet been explored, some studies start in modern times to analyze the impact of diet on the course or in triggering SLE. Food plays a crucial role not only because of its nutritional benefits but also due to its ability to alter and enhance the structure and function of gut microbiota [15–18]. For many years, the influence of nutrients on immune function has been highlighted by evidence linking the prevalence of certain diseases in developing regions or local nutrient shortages to the geoepidemiology of autoimmune diseases. Red beans (*Phaseolus vulgaris L sp*) are rich in human bioactive compounds such as polyphenols [19].

These beans are an outstanding source of plant-based protein and fiber, along with specific micronutrients, and they contain a wide array of bioactive compounds beneficial to the human diet [20–22]. Red beans have high total phenolics content and they express anti-inflammatory as well as antioxidant effects [23–25]. Some studies indicate that *Phaseolus vulgaris L* contains a diversity of phyto-chemicals which include flavonoids, polyphenols, and antioxidants to offer protective physiological effects in the body against myriad maladies such as cancer, heart disease, diabetes, autoimmune disease, and neurodegenerative disease [26–28].

MATERIAL AND METHODS

A comprehensive literature review has been conducted for this recent study. In addition to MeSH and keyword search phrases for SLE, the search strategy also used MeSH and keyword search terms associated with Read Bean Extract (*Phaseolus vulgaris L*). The database searched were Google Scholar from 2013 to November 2023, PubMed from 2013 to 2023,

Research.Gate from 2013 to November 2023, and ScienceDirect from 2013 to November 2023.

Every article and journal was downloaded, and for a thorough assessment, they were manually chosen at random based on their title and abstract. Journals and articles that focused on people and mice and were written in either English or Bahasa were considered. They were categorized as case-control, experimental, cohort, or longitudinal studies. Exclusion articles and journals if it is review journals, conference proceeding, abstracts or editorial, articles in press, and all journals not in English or Bahasa. Table 1 shows the data extraction that taken for the methodology section.

In addition to the five elements mentioned earlier, details such as the study duration, location, characteristics of both the intervention and control groups, the questionnaire used for measuring outcomes, and significant findings like the intervention's impact on psychological symptoms and any reported adverse events were gathered from each study.

RESULTS

Overview of Literature Searching

The PRISMA flowchart of the research selection procedure is shown in Fig. 1. From the queried database, we locate a total of 696 research studies sourced from PubMed, ResearchGate, ScienceDirect, and Google Scholar. Following the elimination of 423 duplicates, 210 publications remained suitable for review of titles and abstracts. According to the selection criteria, 189 studies were eliminated. Subsequently, 21 complete-text articles and documents were assessed for eligibility, and 11 records were omitted due to irrelevant outcomes, active control group designs, or being in languages other than English and Bahasa. Ultimately, 10 studies were incorporated into the qualitative synthesis.

Table 1. Data Extraction for Literature Methods

Data	Definition
Red Kidney Bean (<i>Phaseolus vulgaris L sp</i>)	Is known as one kind of bean that high in fiber (4%), protein (29,1%), unsaturated fatty acids, and vitamin E. More often this bean contain a large number of phytochemical compounds including phenolic, flavonoids, vitexin and isovitexin, which have a positive effect as anti-inflammatory and antioxidant [27].
Systemic Lupus Erythematosus (SLE)	Is a complex autoimmune disease with strong genetic predisposition, with a complex etiology and diverse clinical manifestations [1].
Study Design	All study which are cohort study or experimental study or case control study or longitudinal study
Subject	All journals with study in human, especially woman in productive age 20-50 years old, and/or studies on animals especially mice
Biochemical Method Used	None

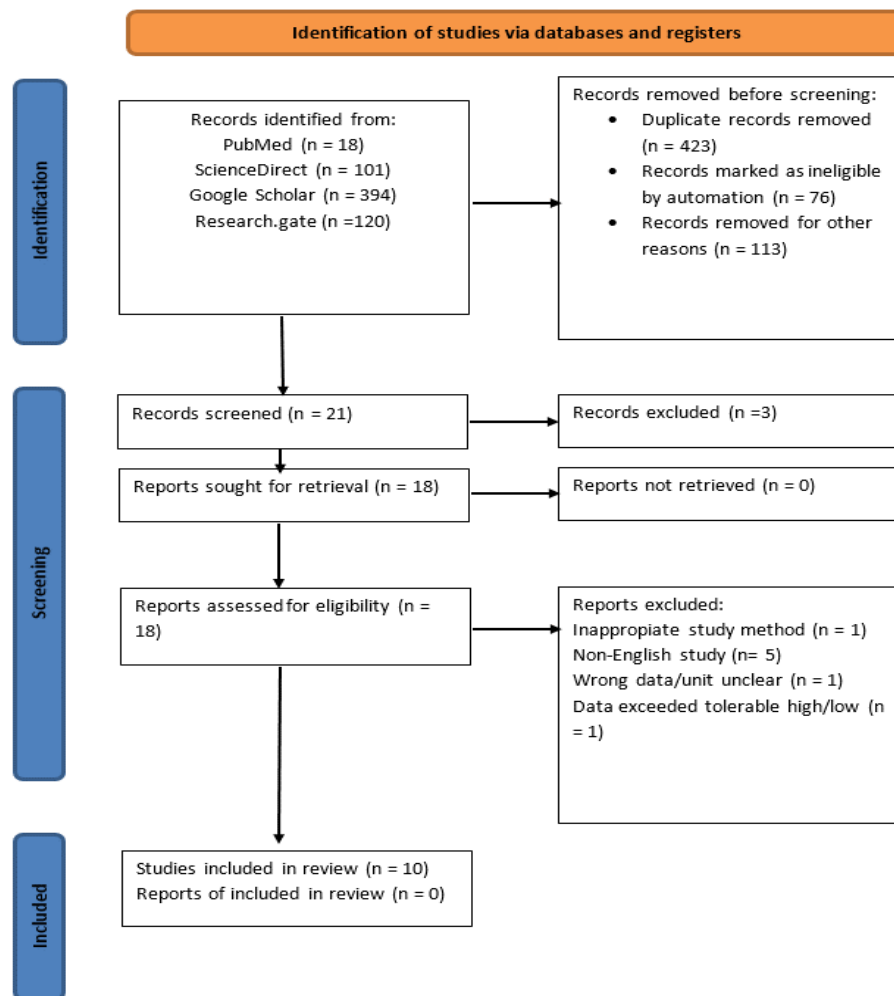


Fig 1. PRISMA Flowchart of the Literature Selection

Study Characteristics

The features of the 10 pertinent studies utilized for this qualitative analysis are outlined in Table 3. In this review, the overall count of participants in the studies included, both in the intervention and control groups, consisted of women diagnosed with SLE and mice that were administered red kidney bean extract. Most of these studies were conducted in Indonesia, China, USA, India, and Poland [4]. The 10 relevant studies that used in this present systematic review show the dietary supplement and nutrition or diet treatment for SLE, especially the effect of red kidney bean (*Phaseolus vulgaris L*) in SLE treatment.

In the systematic review of The Effect of Red Bean Extract (*Phaseolus vulgaris L. sp.*) on Systemic Lupus Erythematosus (SLE) from Obstetrics and Gynecology Perspective, ten primary publications with a total sample of people and mice are described in Table 4.

DISCUSSION

Multiple organ systems, including the skin, joints, kidneys, and brain, are affected by the chronic inflammatory and autoimmune disease known as SLE. The American College of Rheumatology's (ACR) standards are now used to identify SLE. According to the American College of Rheumatology, lupus is diagnosed in those who have four out of eleven symptoms. Through biological mechanisms (such as oxidative stress, changes in pro-inflammatory biomarkers, and modifications in immune signaling), both genetic and environmental factors contribute to the development of the disease. Variations in dietary intake may be one of the factors that contribute to the higher prevalence of SLE in women [29–32].

From the data previously obtained, for example, the effect of nutrients on immune function has long been known to have come from the observations that the

Table 3. Characteristic of Included Study

Country	Authors	Year	Study Design
China	Lou, Xiao Bing et al.	2013	Randomized control trial
Poland	Krasuska, Alexandra and Malgorzata Gorzel	2020	Case Study
Indonesia	Nooryanto Mukhamad et al	2023	Experimental Study
Indonesia	Novriadi, Albert et al	2023	Experimental Study
USA	Constantin, Maria –Magdalena et al	2018	Cohort Study
Indonesia	Permana, Adin Yan et al	2023	Experimental Study
Indonesia	H, Winarsih, Septiana AT, and Wulandari SP	2020	Experimental Study
India	Akash et al	2018	Experimental In-Vitro Study
China	Chu, Thomas et al	2020	Experimental In-Vitro Study
USA	Catro-Webb, Nalsy et al	2021	Population Study, Longitudinal Study

incidence of specific disease occurs at the time for developed countries or at the bottom of epidemics that might underlie the geoepidemiology of autoimmune disease [3,33,34]. According to a study on the incidence and prevalence of SLE worldwide, the greatest estimations of SLE incidence and prevalence are observed in North America. Africa, on the other hand, has the lowest incidence and prevalence rates, according to the same study; Ukraine reports 0.3 instances per 100,000 person-years [14,34,35]. According to a previous study, white women are the least likely to get SLE, and women are more likely than males of the same age or ethnicity to be afflicted. The same conclusion that black women had a greater incidence rate of SLE than white women is also shown by another study. This research also asserted that one of the issues was nutritional differences [3,28,29,36].

Treatment for SLE depends on its severity and the organs involved. Besides the medication, a lot of studies nowadays explain that the nutritional therapy will be promising for anti-inflammatory and antioxidant effects in SLE. Several earlier studies indicate that red bean (*Phaseolus vulgaris* L) is not only an excellent source of plant-based protein, fiber, and various micronutrients essential for human nutrition, but it also possesses a wide range of bioactive compounds. Colored beans are rich in phenolic compounds, including flavonoids and phenolic acids, which diminish 180 minutes following the administration of red kidney bean extract. This result is better than if it were injected with the other anti-inflammation, such as diclofenac, and for sure, this result is better than if it were injected with a placebo [33,34,37].

Past studies show that ISO-1 in red kidney beans had a strong anti-inflammatory impact, possibly making it a good non-steroid treatment option down the road. [15,38]. Other studies say that red bean extract boosted HepG2 cell growth quite a bit after 24 hours. This likely indicates antioxidant activity or a T-2 hormetic effect,

suggesting that the red bean extract could alter the influence of oxidative stress on HepG2 cells [22,36,39].

Although some previous studies show positive improvement for anti-inflammatory and antioxidant effects of red kidney bean in SLE, A different study indicates that red kidney bean extract, which contains isoflavones, does not lead to a significant decrease in IL-6 and IL-10 levels. However, it does show positive effects on IL-1, enhances inhibin B levels, and boosts PCNA expression in mice with SLE [8,10,25,40].

According to all results of previous studies, red bean extract (*Phaseolus vulgaris* L) contains phenolic compounds, giving a positive effect in anti-inflammatory and antioxidant properties for Systemic Lupus Erythematosus. Studies reported that red bean extract in an adequate level injection will give giving antiradical that can be another solution for some diseases. From all studies that show this positive results in reducing SLE symptoms, red beans will be one of the safest solutions for women who are diagnosed with SLE and preparing to have a child. This option will be a good consideration, although it still needs a lot of improvement and studies in the future.

CONCLUSION

From the research above, we concluded that red bean extract (*Phaseolus vulgaris* L. sp) is a great source of nutrition and diet for body health, especially rich in bioactive compounds. Bioactive compounds such as phenolic compounds, such as flavonoids, phenolic acids, give a very promising result for anti-inflammatory and antioxidant effects in SLE. On the other hand, SLE is a long-lasting autoimmune and inflammatory condition that has the potential to impact various organ systems. and seems like without no clear treatment. The nutrition and dietary treatment were one of the choices that are being considered these days. From all studies that show these positive results in reducing SLE

Table 4. PICO Table Summary of Primary Articles Sources with Sample Size (n = 785 women and 125 mice model)

Author (Year)	Country	Sample	P	I	C	O
Lou, Xiao Bing et al. (2013)	China	100	Women aged 20-50 years old	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	Another Herbal Medicine AND/OR placebo	Obstetric and Gynecology Effect in Systemic Lupus Erythematosus (SLE)
Krasuska, Alexandra and Malgorzata Gorzel (2020)	Poland	25	Women aged 20-50 years old diagnosed with SLE	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	Placebo	Obstetric and Gynecology Effect in Systemic Lupus Erythematosus (SLE)
Nooryanto Mukhamad et al (2023)	Indonesia	25	Female SLE Mice Model	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	The age of the experimental animal, the sex of the experimental animal, and the food intake of the experimental animal	Level of IL-10 in SLE Model
Novriadi, Albert et al (2023)	Indonesia	25	Female SLE Mice Model	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	The age of the experimental animal, the sex of the experimental animal, and the food intake of the experimental animal	PCNA and IL-1 level in the serum of SLE Model
Constantin, Maria – Magdalena et al (2018)	USA	120	Women aged 20-50 years old diagnosed with SLE	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	Another Herbal Medicine AND/OR placebo	Obstetric and Gynecology Effect in Systemic Lupus Erythematosus (SLE)
Permana, Adin Yan et al (2023)	Indonesia	25	Female SLE Mice Model	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	The age of the experimental animal, the sex of the experimental animal, and the food intake of the experimental animal	IL-6 level in the serum of SLE Model
H, Winarsih, Septiana AT, and Wulandari SP (2020)	Indonesia	50	Mice (Animals) Model	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	The age of the experimental animal, the sex of the experimental animal, and the food intake of the experimental animal	Phenolic, Protein Content, and Anti-Inflammatory
Akash et al (2018)	India		Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>)	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract in Human Blood	Placebo in Human Blood	Antioxidant and Anti-Inflammatory Effect
Chu, Thomas et al. (2020)	China	100	Women aged 20-50 years old diagnosed with SLE	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	Placebo	Obstetric and Gynecology Effect in Systemic Lupus Erythematosus (SLE)
Catro-Webb, Nalsy et al (2021)	USA	440	Black Women in productive age	Red Kidney Bean (<i>Phaseolus vulgaris L. sp</i>) Extract	Placebo	Obstetric and Gynecology Effect in Systemic Lupus Erythematosus (SLE)

symptoms, red beans will be one of the safest solutions for women who are diagnosed with SLE and preparing to have a child.

ACKNOWLEDGMENT

We thank all the authors of the articles reviewed in this article.

CONFLICT OF INTEREST

No conflict of interest relevant to this study.

REFERENCES

- Agmon-Levin, N., Theodor, E. & Shoenfeld, Y. Diet and lupus, *Isr Med Assoc J*, 2012; 14(3), p. 137–142.
- Arriens, C. et al. Dietary factors and systemic lupus erythematosus, *Frontiers in Immunology*, 2015; 6, p. 608.
- Brown, A.C. Nutrition and autoimmune disease: reviewing the evidence for an anti-inflammatory diet, *Nutrients*, 2021; 13(9), p. 3154.
- Castro-Webb, N. et al. Dietary patterns and macronutrients and the risk of systemic lupus erythematosus, *American Journal of Clinical Nutrition*, 2021; 114, p. 1486–1494.
- Luo, B.X. et al. The expression of microRNA-146a promoter is altered by a functional variant', *PLoS Genetics*, 2013, available at: <https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1002128>
- Patavino, T. & Brady, D.M. Natural medicine and nutritional therapy as alternative treatment in SLE, *Alternative Medicine Review*, 2013; 6(5).
- Aparicio-Soto, M., Sanchez-Hidalgo, M. & Alarcón-de-la-Lastra, C. An update on diet and nutritional factors in systemic lupus erythematosus management', *Nutrition Research Reviews*, 2017; 30, p. 118–137.
- Krasuska, A. & Gorzel, M. Alleviation of erythematous changes in systemic lupus erythematosus with flavonoids – case study, *Archives of Physiotherapy and Global Research*, 2020; 24(2), p. 7–16.
- Nooryanto, M. et al. Impact of red bean extract on IL-10 levels in SLE mice', *Asian Journal of Health Research*, 2023; 2(2), p. 29–35.
- Tang, X. et al. The role of flavonoids in immune regulation and autoimmune diseases, *Frontiers in Immunology*, 2021; 12, p. 759.
- Novriadi, A. et al. Red bean extract and its impact on IL-1, Inhibin B, and PCNA expression in SLE mice, *Asian Journal of Health Research*, 2023; 2(2), p. 38–42.
- Alarcón-Riquelme, M.E. Role of genetics in SLE pathogenesis, *Nature Reviews Rheumatology*, 2017; 13(8), p. 507–517.
- Li, Z. et al. Oxidative stress and its role in the pathogenesis of systemic lupus erythematosus, *Journal of Clinical Medicine*, 2019; 8(6), p. 810.
- Navarra, S.V. et al. Efficacy and safety of belimumab in active SLE, *The Lancet*, 2011; 377(9767), p. 721–731.
- Rees, F. et al. Global incidence and prevalence of SLE', *Rheumatology*, 56(11), 2017; p. 1945–1961.
- Constantin, M.M. et al. Dietary factors' importance and effect on systemic lupus erythematosus (SLE), *Publication Spandis*, 2018; p. 1085–1090.
- Fragoso, Y.D. & Brooks, J.B. Nutritional strategies in chronic autoimmune disease, *Nutrition Journal*, 2015; 14, p. 35.
- Gil, Á. & Ortega, R.M. Effect of micronutrients on immune function, *Proceedings of the Nutrition Society*, 2019; 78(4), p. 345–359.
- Jung, J.Y. et al. The role of vitamin D in autoimmune diseases, *Journal of Korean Medical Science*, 2017; 32(7), p. 1138–1146.
- Nuchnoi, P. et al. Natural compounds with anti-inflammatory properties, *Phytomedicine*, 2020; 67, p. 153157.
- De Luca, C. & Valacchi, G. Surface lipids as multifunctional mediators in skin health and disease, *Clinical Dermatology*, 2010; 28(4), p. 432–438.
- Hsieh, C.C. & Lin, B.F. Dietary factors regulate cytokines in murine models of systemic lupus erythematosus, *Autoimmunity Reviews*, 2013; 11(1), p. 22–27.
- Martínez-Alonso, C. et al. Effect of red bean phenolic extract on T-2 toxin-induced cytotoxicity, *Foods*, 2022; 11(7), p. 1033.
- Gualtierotti, R. et al. Modulation of immune response with nutraceuticals, *Autoimmunity Reviews*, 2017; 16(9), p. 918–924.
- Jia, X. et al. Polyunsaturated fatty acids and autoimmune diseases: focus on systemic lupus erythematosus, *Frontiers in Immunology*, 2021; 12, p. 669.
- Permana, A.Y. et al. Effects of red bean extract on IL-6 and AMH levels in SLE mice, *Asian Journal of Health Research*, 2023; 1(3), p. 11–16.
- Costenbader, K.H. & Karlson, E.W. Antioxidants and systemic lupus erythematosus: a review', *Lupus*, 2006; 15(11), p. 778–783.
- Filippini, M. et al. Clinical effects of omega-3 polyunsaturated fatty acids in autoimmune diseases, *Journal of Autoimmunity*, 2017; 77, p. 12–23.
- Kimothi, S. & Dhaliwal, Y.S. Nutritional and health-promoting characteristics of kidney beans (*Phaseolus vulgaris* L.), *International Journal of Current Microbiology and Applied Sciences*, 2020; 9(5), p. 1201–1209.
- Castro-Webb, N., Palmer, J.R., Wise, L.A. & Rosenberg, L. Dietary patterns, macronutrients and the risk of systemic lupus erythematosus: the Black

- Women's Health Study, American Journal of Clinical Nutrition, 2021; 114, p. 1486–1494.
31. Tsokos, G.C., Lo, M.S., Reis, P.C. & Sullivan, K.E. New insights into the immunopathogenesis of systemic lupus erythematosus, Nature Reviews Rheumatology, 2016; 12(12), pp. 716–730.
 32. Venegas-Pont, M. et al. Inflammation and immunity in SLE, American Journal of Physiology–Renal Physiology, 2010; 299(3), pp. F485–F499.
 33. Wu, T. et al. Metabolic disturbances in systemic lupus erythematosus, Nature Reviews Rheumatology, 2016; 12(2), pp. 99–110.
 34. Akash, M. et al. (n.d.) Antioxidant and Anti-Inflammatory Effects of Phaseolus Vulgaris L. Seeds Ethanol Extract: An In-Vitro Study. International Research Journal of Pharmacy, 2018; 9(8).
 35. Alberti, A. & Bolognini, L. Plant-derived antioxidants and immune modulation, Phytotherapy Research, 2020; 34(8), p. 1809–1821.
 36. Kementerian Kesehatan RI. Situasi Lupus di Indonesia. Pusat Data dan Informasi Kementerian Kesehatan RI. 2017
 37. Tedeschi, S.K. et al. Dietary patterns and risk of SLE in women, Lupus, 2020; 29(1), p. 67–73.
 38. H, Wulandari S.P., Winarsih & Septiana A.T. Red kidney bean (*Phaseolus vulgaris* L.) sprout milk's sensory qualities, phenolic content, protein content, and anti-inflammatory qualities, Food Research, 2020; 4(6), p. 1921–1928.
 39. Chu, T. et al. Contact dermatitis caused by 2,4-dinitrochlorobenzene is suppressed by an isoflavone extract from soybean cake, Journal of Ethnopharmacology, 2020; 263.
 40. Oomah, B.D., Ward, S. & Balasubramanian, P. Dehulling and physical characteristics of Canadian dry bean', Food Research International, 2010; 43(5), p. 1410–1415.
 41. Brazaitytė, A., Venskutonis, R., & Gruzdienė, D. *Novel insights into Phaseolus vulgaris L. sprouts: Phytochemical analysis and antioxidant and anti-inflammatory properties. Journal of Functional Foods*, 2024, XX, 101928.