Sesameinfo.in
Global Knowledge hub

Compendium of Clinical Trials on Sesame Seed Consumption on Human Health and Wellness

Volume-1 | September, 2025

www.sesameinfo.in

EDITORIAL

Dear Readers,

It gives us immense pleasure to present this special publication, "Compendium of Clinical Trials on Sesame Seed Consumption on Human Health and Wellness-Vol-1," being released on the occasion of the World Sesame and Peanut Conference, 2025 in Istanbul, Turkey.

Over the last two decades, globally respected research institutions have undertaken numerous clinical trials and scientific studies to better understand the role of sesame seed consumption on human health and wellness. From cardiovascular protection and diabetes management to bone health and cognitive function, these studies have consistently demonstrated encouraging outcomes. Rich in bioactive lignans, antioxidants, and essential fatty acids, sesame stands out as more than just a food ingredient—it is increasingly recognized as a scientifically validated functional food that supports long-term well-being.

The objective of this compendium is to compile available research on sesame seed consumption. It is not exhaustive; rather, it seeks to encourage the collection of further studies and stimulate new research in the sesame field, contributing to a broader and deeper understanding of sesame's role in health and wellness.

This volume therefore brings together key clinical studies, providing a reliable reference for industry stakeholders, health professionals, researchers, and consumers.

We gratefully acknowledge the researchers, institutions, and contributors whose work forms the foundation of this publication, as well as the photographs and visual materials sourced from various platforms that have enriched its presentation.

A special word of gratitude to Ms Sindhu V H, Mr Venkatraman, and Mrs Radhika for bringing this book to life.

Please share your suggestions and feedback at swapna@eventellglobal.com, venkat@eventellglobal.com, or analyst@eventellglobal.com to help shape future volumes.

Together, let us continue to advance the message of health and wellness through sesame.

Warm regards,
Swapna B E, Vinayak Meharwade, G Srivatsava

DIRECTOR & CEO
G Srivatsava

DIRECTOR & COO
Vinayak Meharwade

VICE PRESIDENTS
Swapna B E
Abhinaya S

CONTENT TEAM
Venkatraman S
Sindhu Hosamani

DATA SUPPORT
Sanjay & Shivakumar

GRAPHIC DESIGNERS
Radhika K & Sathiyan

MARKETING TEAM
Ravi Bhandage
Prajakta Sardesai

WEB DEVELOPERS
Manivannan & Imayavaramban G

TEAM
N Srinivasa Moorthy
Prathik Tambre
Krishnendu Roy
Nikshep T A
Khushi Verma
Prathamesh
Srikantharaman LS
Chandrasekaran S
Gajendra, Sumalatha
Varun, Jaisheelan, Ramya

VIDEOGRAPHER
RA Jirali

PUBLISHING OFFICE
Eventell Global Advisory Pvt Ltd
Sesameinfo.in
#146, 1-2 Floor, Gopal Towers
Ramaiah Street, HAL Airport Road,
Kodihalli, Bangalore – 560008

Tel: +91-80-41535476
Email: swapna@eventellglobal.com
Mob: + 91 9342840609
Web: www.sesameinfo.in
www.eventellglobal.com

TABLE OF CONTENT

I. THE SESAME PLANT: AN ANCIENT AND RESILIENT CROP

The history of sesame cultivation is believed to be one of the oldest on Earth, with archaeological evidence of its use dating back over 5,000 years. The plant itself is a marvel of resilience and sustainability. It is exceptionally tolerant of drought and high temperatures, thriving in climatic conditions where many other crops would fail. Its deep taproot system, which can extend several feet into the soil, allows it to access water and nutrients from far below the surface, making it a crucial and low-resource crop for farmers in arid and semi-arid regions.

The plant grows to a height of up to two meters, producing beautiful, bell-shaped flowers that range in color from white to purple. After pollination, these flowers develop into capsules, or pods, containing up to 100 seeds. The moment the seeds reach maturity, the capsules burst open with a distinctive sound, a process known as dehiscence. This natural phenomenon is believed to be the origin of the famous phrase "Open Sesame!" from the ancient tale of Ali Baba and the Forty Thieves, referencing the treasure chamber that bursts open just like a sesame pod.

II. CLINICAL TRIALS AND SCIENTIFIC STUDIES

Sesame seeds and their oil have been celebrated for their remarkable health benefits due to their rich nutritional profile, including healthy fats, proteins, vitamins, and antioxidants. These seeds are known for their ability to improve cardiovascular health by lowering cholesterol levels, reducing blood pressure, and enhancing endothelial function. The antioxidants, such as lignans like sesamin and sesamol, play a crucial role in protecting the body from oxidative stress, which is a key factor in preventing chronic diseases like heart disease and cancer.

In addition to cardiovascular benefits, sesame seeds help in managing metabolic health, particularly for individuals with type 2 diabetes. They improve blood glucose control, enhance insulin sensitivity, and reduce inflammation. The seeds are also beneficial for skin health, reducing the risk of inflammatory conditions and promoting a healthy complexion. Sesame's high content of essential fatty acids and antioxidants makes it a powerful natural remedy for enhancing overall health, improving sleep quality in the elderly, and offering relief from conditions such as arthritis and menopausal symptoms.

I. CLINICAL TRIALS

A.CARDIOVASCULAR HEALTH

1. Sesame Oil Consumption Exerts a Beneficial Effect on Endothelial Function in Hypertensive Men

Author(S)
Karatzi Kalliopi, Stamatelopoulos Kimon, Lykka Maritta, Mantzouratou Pigi, Skalidi Sofia, Zakopoulos Nikolaos, Papamichael Christos, Sidossis S Labros

Authors Affiliation

- Laboratory of Nutrition and Clinical Dietetics, Department of Nutrition and Dietetics, Harokopio University, El.Venizelou 70, 17671, Athens, Greece.
- Vascular Laboratory, Department of Clinical Therapeutics, Alexandra University Hospital, Vasilissis Sofias 80. 11528, Athens, Greece.
- Department of Internal Medicine-Geriatrics, Sealy Center on Aging, Institute for Translational Sciences and Shriners Burns Institute, University of Texas Medical Branch at Galveston, Rebecca Sealy Hospital Bldg. 6.128, 77555-0177, Galveston Texas, USA

Abstract

Background

The aim of the study was to investigate the effects of sesame oil on endothelial function and to detect the underlying mechanisms, both in the postprandial state and after long-term consumption.

Design

We enrolled 30 hypertensive men in a two-phase study. In the first phase, 26 volunteers consumed 35 g of either sesame oil or control oil. Endothelial function, inflammatory activation and nitric oxide syntase (NOS) inhibition was assessed after a 12 hour fast and 2 hours after consumption of an oil-containing standardized meal. In the second phase, 30 volunteers consumed 35 g of sesame oil or control oil daily for 2 months and the above-mentioned parameters were assessed at baseline, 15, 30 and 60 days.

Methods

Endothelial function was estimated by endothelium-dependent FMD (flow-mediated dilatation) of the brachial artery.

Results

Flow mediated dilatation (FMD) improved significantly both after acute (p=0.001) and long-term sesame oil consumption (p=0.015, p=0.005 and p=0.011 for 15, 30 and 60 days respectively). Intracellular adhesion molecule (ICAM) levels decreased significantly after only 60 days of daily sesame oil intake (p=0.014). By contrast, no changes were observed in the control group in either phase of the study.

Conclusions

This is the first study to show that sesame oil consumption exerts a beneficial effect on endothelial function and this effect is sustained with long-term daily use.

Keywords: blood pressure, sesame oil, FMD, endothelial function

To get the full article, please scan the QR code

2. Dietary Sesame Reduces Serum Cholesterol and Enhances Antioxidant Capacity in Hypercholesterolemia

Author(s)

Pey Rong Chen, Kuo Liong Chien, Ta Chen Su, Chee Jen Chang, Tsuei-Ling Liu, Hsiuching Cheng, Chingmin Tsai

Authors Affiliation

- Department of Nutrition and Food Sciences, Fu Jen University, Taipei 242, Taiwan
- Department of Dietetics, National Taiwan University Hospital and National Taiwan University, Taipei 100, Taiwan
- Department of Internal Medicine, National Taiwan University Hospital and National Taiwan University, Taipei 100, Taiwan
- Institute of Preventive Medicine, National Taiwan University Hospital and National Taiwan University, Taipei 100, Taiwan
- Department of Medical Research, National Taiwan University Hospital and National Taiwan University, Taipei 100, Taiwan
- Department of Nutrition and Health Science, College of Public Health and Nutrition, Taipei Medical University, Taipei 110, Taiwan
- Department of Bioscience Technology, Chung Yuang University, Chungli 320, Taiwan

Abstract

The purpose of the study was to investigate the effects of sesame on lowering serum lipids and enhancing antioxidant capacity in 21 hyperlipidaemic patients. Subjects were instructed to consume their regular diet for 2 weeks before starting the experimental diet. The experimental diet with 40 g roasted sesame was consumed for 4 weeks and the regular diet followed for another 4 weeks. Body weights and fasting blood were determined at weeks 0, 4, and 8. The results showed that the diet with sesame significantly decreased the levels of serum total cholesterol and low-density lipoprotein (LDL) cholesterol. The time for erythrocyte hemolysis and the lag phase of LDL oxidation were significantly increased by sesame ingestion. A diet containing sesame slightly reduced the levels of thiobarbituric acid–reactive substances in LDL. The beneficial effects of sesame disappeared when patients returned to their regular diets. Sesame in this study appeared to exert beneficial effects on serum lipids and to improve antioxidant capacity in hypercholesterolemic patients.

To get the full article, please scan the QR code

3. Effect Of Sesame Seed on Lipid Profile and Redox Status in Hyperlipidemic Patients

Author(S)

Beitollah Alipoor, Mahdieh Khadem Haghighian, Bina Eftekhar Sadat & Mohammad Asghari

Authors Affiliation

- Department of Community Nutrition, Faculty of Health and Nutrition, Tabriz University (Medical Sciences), Tabriz, Iran
- Physical Medicine and Rehabilitation, Faculty of Medicine, Tabriz University (Medical science), Tabriz, Iran
- Biostatistics, Faculty of Health and Nutrition. Tabriz University (Medical science), Tabriz,Iran

Abstract

Pre-clinical studies suggest that sesame and its lignans induce beneficial changes in risk factors related to cardiovascular disease. This study was designed to investigate the effects of sesame on reducing serum lipids and enhancing antioxidant capacity in 38 hyperlipidemic patients who were divided into two groups randomly. For all individuals along the 60 days of study period, the same drug treatments were considered. Intervention group patients were supposed to eat 40 g white sesame seeds daily, and instead of these calories, 240 kcal was removed from their diet. Anthropometric measurements including height, weight and body mass index (BMI) were measured. We assessed lipid profile and oxidative stress indicators such as glutathione peroxidase (GPX), superoxide dismutase (SOD) and thiobarbituric acid reactive substances (TBARS) before and after the intervention. Significant differences among and between the groups were determined by independent t-test and paired sample t-test using 13th version of statistical package for the social sciences. The results showed that the diet with sesame significantly decreased the levels of serum total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) and TC/HDL-C ratio. Lipid peroxidation

(TBARS) decreased while the activities of GPX and SOD were increased. There were no significant changes in anthropometric indexes such as weight and BMI after consumption of sesame. The results suggested that sesame seed supplementation decreased serum TC, LDL-C and lipid peroxidation, and increased antioxidant status in hyperlipidemic patients.

Keywords: hyperlipidemic patient, lipid profile, oxidative stress, sesame seed

Conclusion

Supplementation of sesame seeds has beneficial effects on the levels of TC, LDL-C, lipid peroxidation and antioxidants. These beneficial effects of sesame may contribute to a protective action to counter atherosclerosis in hypercholesterolemic patients.

To get the full article, please scan the QR code

4. Effect of Sesame Oil on Diuretics or ß-blockers in the Modulation of Blood Pressure, Anthropometry, Lipid Profile, and Redox Status

Author(s)

D Sankar , M Ramakrishna Rao , G Sambandam , KV Pugalendi

Abstract

The study was undertaken to investigate the effect of sesame oil in hypertensive patients who were on antihypertensive therapy either with diuretics (hydrochlorothiazide) or ß-blockers (atenolol). Thirty-two male and 18 female patients aged 35 to 60 years old were supplied sesame oil (Idhayam gingelly oil) and instructed to use it as the only edible oil for 45 days. Blood pressure, anthropometry, lipid profile, lipid peroxidation, and enzymic and non-enzymic antioxidants were measured at baseline and after 45 days of sesame oil substitution. Substitution of sesame oil brought down systolic and diastolic blood pressure to normal. The same patients were asked to withdraw sesame oil consumption for another 45 days, and the measurements were repeated at the end of withdrawal period. Withdrawal of sesame oil substitution brought back the initial blood pressure values. A significant reduction was noted in body weight and body mass index (BMI) upon sesame oil substitution. No significant alterations were observed in lipid profile except triglycerides. Plasma levels of sodium reduced while potassium elevated upon the substitution of sesame oil. Lipid peroxidation (thiobarbituric acid reactive substances [TBARS]) decreased while the activities of superoxide dismutase (SOD), catalase (CAT), and the levels of vitamin C, vitamin E, ß-carotene, and reduced glutathione (GSH) were increased. The results suggested that sesame oil as edible oil lowered blood pressure, decreased lipid peroxidation, and increased antioxidant status in hypertensive patients.

To get the full article, please scan the QR code

5. Antihypertensive Effects of Sesamin in Humans

Author(S)

Takashi Miyawaki , Hideshi Aono, Yoshiko Toyoda-Ono, Hirofumi Maeda, Yoshinobu Kiso, Kenji Moriyama

Authors affiliation

- NTT West Kansai Health Administration Center, 604, Bano-cho, Nakagyo-ku, Kyoto 604-8172, Japan.
- NTT West Kyoto Hospital, Kyoto 601–8441, Japan
- Institute for Health Care Science, Suntory Ltd., Mishima-gun, Osaka 618–8503, Japan
- School of Pharmaceutical Sciences, Mukogawa Women's University, Nishinomiya, Hyogo 663–8179, Japan

Abstract

Sesamin, one of the lignans contained in sesame, has been considered to have medicinal effects. It has been reported that sesamin suppressed the development of hypertension in rats. In this study, using a double-blind, cross-over, placebo-controlled trial, we investigated the effect of 4-wk administration of sesamin on blood pressure (BP) in mildly hypertensive humans. Twenty-five middle-aged subjects with mild hypertension were divided into

two groups, matched by age and body mass index. Twelve subjects were allocated to 4-wk intake of capsules with 60 mg sesamin per day and 13 subjects to 4-wk intake of a placebo (period 1). After a 4-wk washout period, the subjects received the alternative administration for 4 wk (period 2). BP decreased with statistical significance with the administration of sesamin (systolic: 137.6+/-2.2 to 134.1+/-1.7 mmHg, p=0.044, diastolic: 87.7+/-1.3 to 85.8+/-1.0 mmHg, p=0.045), but little changed with the placebo (systolic: 135.0+/-1.8 to 135.1+/-1.7 mmHg, diastolic: 85.9+/-1.2 to 86.6+/-1.2 mmHg). In conclusion, 4-wk administration of 60 mg sesamin significantly decreased BP by an average of 3.5 mmHg systolic BP and 1.9 mmHg diastolic BP. These results suggest that sesamin has an antihypertensive effect in humans. Epidemiological studies suggested that a 2-3 mmHg decrease in BP reduces the rate of cardiovascular diseases; therefore, it is considered that BP reduction achieved by sesamin may be meaningful to prevent cardiovascular diseases.

Conclusion

In conclusion, 4-week administration of 60 mg sesamin significantly decreased blood pressure by an average of 3.5 mmHg systolic and 1.9 mmHg diastolic. These results suggest that sesamin has an antihypertensive effect in humans. Epidemiological studies indicate that a 2–3 mmHg reduction in blood pressure can lower cardiovascular disease risk; therefore, the BP reduction achieved by sesamin may be meaningful in preventing cardiovascular diseases.

To get the full article, please scan the QR code

6. Antihypertensive and Antioxidant Effects of Dietary Black Sesame Meal in Pre-Hypertensive Humans

Author(S)

Jatuporn Wichitsranoi Natthida Weerapreeyakul, Patcharee Boonsiri, Chatri Settasatian, Nongnuch Settasatian, Nantarat Komanasin, Suchart Sirijaichingkul, Yaovalak Teerajetgul, Nuchanart Rangkadilok, Naruemon Leelayuwat

Authors Affiliation

Faculty of Physical Therapy, Mahidol University, Thailand.

Abstract

Background

It has been known that hypertension is an independent risk factor for cardiovascular disease (CVD). CVD is the major cause of morbidity and mortality in developed and developing countries. Elevation of blood pressure (BP) increases the adverse effect for cardiovascular outcomes. Prevention of increased BP plays a crucial role in a reduction of those outcomes, leading to a decrease in mortality. Therefore, the purpose of this study was to investigate the effects of dietary black sesame meal on BP and oxidative stress in individuals with prehypertension.

Methods

Twenty-two women and eight men (aged 49.8 ± 6.6 years) with prehypertension were randomly divided into two groups, 15 subjects per group. They ingested 2.52 g black sesame meal capsules or placebo capsules each day for 4 weeks. Blood samples were obtained after overnight fasting for measurement of plasma lipid, malondialdehyde (MDA) and vitamin E levels. Anthropometry, body composition and BP were measured before and after 4-week administration of black sesame meal or a placebo.

Results

The results showed that 4-week administration of black sesame meal significantly decreased systolic BP (129.3 ± 6.8 vs. 121.0 ± 9.0 mmHg, $P < 0.05$) and MDA level (1.8 ± 0.6 vs. 1.2 ± 0.6 µmol/L, $P < 0.05$), and increased vitamin E level (29.4 ± 6.0 vs. 38.2 ± 7.8 µmol/L, $P < 0.01$). In the black sesame meal group, the change in SBP tended to be positively related to the change in MDA ($R = 0.50$, $P = 0.05$), while the change in DBP was negatively related to the change in vitamin E ($R = -0.55$, $P < 0.05$). There were no correlations between changes in BP and oxidative stress in the control group.

Conclusions
These results suggest the possible antihypertensive effects of black sesame meal on improving antioxidant status and decreasing oxidant stress. These data may imply a beneficial effect of black sesame meal on prevention of CVD.

To get the full article, please scan the QR code

7. Effect of Sesamin Supplementation on Cardiovascular Risk Factors in Women with Rheumatoid Arthritis

Author(S)
B Helli, K Mowla, M Mohammadshahi, M T Jalali

Affiliations
- Department of Nutrition, Nutrition and Metabolic Diseases Research Center.
- Department of Rheumatology, School of Medicine.
- Department of Nutrition, Hyperlipidemia Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, IRAN.

Abstract
Objective
Rheumatoid arthritis (RA) is an inflammatory disease with increased mortality from cardiovascular disease (CVD). Oxidative stress has a critical role in the pathogenesis of RA and CVD. Sesamin, the main lignin constituent of sesame, has several antioxidant and anti-inflammatory effects. This study aimed to investigate the effects of sesamin supplementation on anthropometric indices, lipid profile, blood pressure, and oxidative stress markers in women with RA.

Methods
In this randomized, double-blind, placebo-controlled clinical trial, 44 patients with RA were randomly divided into 2 groups (intervention and control). Patients consumed 200 mg/day sesamin supplement and placebo in the intervention and control groups, respectively, for 6 weeks (spring 2014). At baseline and at the end of the study, anthropometric indices and blood pressure were assessed. Serum concentrations of lipid profile, malondialdehyde (MDA), and total antioxidant capacity (TAC) were also determined.

Results
At the end of study, sesamin supplementation significantly decreased serum levels of MDA ($p = 0.018$) and increased TAC and high-density lipoprotein cholesterol (HDL-C) levels in patients with RA ($p = 0.020$ and $p = 0.007$, respectively). In the sesamin group, the mean of weight, body mass index, waist-to-hip ratio, body fat, systolic blood pressure, and the concentration of other lipid profiles (triglycerides, total cholesterol, and low-density lipoprotein cholesterol [LDL-C]) were also significantly decreased at the end of study compared to baseline values ($p < 0.05$). However, the difference between the 2 groups was not statistically significant in this regard ($p > 0.05$).

Conclusion
Sesamin exhibited a protective effect on cardiovascular risk factors in patients with RA. However, further investigation is suggested.

Keywords
cardiovascular disease; oxidative stress; rheumatoid arthritis; sesame.

To get the full article, please scan the QR code

8. Tahini Consumption Affects Blood Pressure and Endothelial Function in Healthy Males

Author(S)

Eleni-Konstantina I Sakketou, Georgios K Baxevanis, Nikolaos K Tentolouris, George D Konstantonis, Vaios T Karathanos, Georgios A Fragkiadakis, Panagiotis T Kanello

Affiliations

- Laboratory of Dietetics & Human Body Composition, Department of Nutrition and Dietetics Sciences, School of Health Sciences, Hellenic Mediterranean University, Siteia, Greece.
- Diabetes Center, First Department of Propaedeutic Internal Medicine, Medical School, National and Kapodistrian University of Athens, Laiko General Hospital, Athens, Greece.
- Department of Nutrition and Dietetics, School of Heath Sciences and Education, Harokopio University, Kallithea, Athens, Greece.
- Laboratory of Dietetics & Human Body Composition, Department of Nutrition and Dietetics Sciences, School of Health Sciences, Hellenic Mediterranean University, Siteia, Greece.
- Department of Nutrition and Dietetics, School of Heath Sciences and Education, Harokopio University, Kallithea, Athens, Greece.

Abstract

Sesame (Sesamum indicum L.) is rich in polyunsaturated fatty acids, proteins, vitamin E, and lignans. Recent studies have highlighted the antioxidant, antihypertensive, hypolipidemic, and appetite-control properties of sesame seeds and sesame oil. However, there is a gap in the literature regarding the effect of tahini (sesame paste) consumption on human health. Thus, the aim is to investigate the postprandial effect of tahini consumption on blood pressure, endothelial function, and arterial stiffness. Twenty healthy men with mean age of 28 y and mean BMI of 25.81 kg/m2 were included. After a 12-h fast, baseline blood was collected, participants consumed 50 g of tahini, and blood collection was repeated 4 h postprandially. Assessment of blood pressure, pulse rate, hemodynamic parameters, and endothelial function was performed at baseline and at the end of the trial. Blood samples were used for the quantification of intercellular cell-adhesion molecule-1, vascular cell-adhesion molecule-1, and E-selectin levels at baseline and 4 h postprandially. A statistically significant decrease in diastolic blood pressure ($p = 0.010$) and pulse rate ($p = 0.002$) were observed 4 h after tahini consumption. Significant increases in serum triglycerides ($p < 0.001$) and flow-mediated dilatation were observed ($p = 0.022$) 4 h postprandially. No changes were observed in other indices measured at the end of the intervention compared with baseline. This is the first study to report that tahini consumption can lower blood pressure and pulse rate and improve endothelial function, suggesting a healthy snack in place of others with a less desirable lipid profile.

To get the full article, please scan the QR code

SUMMARY

Studies have shown that consuming sesame products can positively impact cardiovascular health in several ways. Sesame oil and sesamin, a lignin in sesame, have been found to lower both systolic and diastolic blood pressure in hypertensive and pre-hypertensive individuals. The consumption of sesame seeds, sesame oil, and sesamin has also been shown to reduce serum levels of total cholesterol (TC) and low-density lipoprotein (LDL) cholesterol. Furthermore, these products can improve the body's antioxidant capacity by decreasing lipid peroxidation and increasing the activity of antioxidant enzymes like superoxide dismutase (SOD) and glutathione peroxidase (GPX). Finally, both sesame oil and tahini (sesame paste) consumption can improve endothelial function, which is crucial for healthy blood vessels.

B. METABOLIC HEALTH AND DIABETES

1. White Sesame Seed Oil Mitigates Blood Glucose Level, Reduces Oxidative Stress, and Improves Biomarkers of Hepatic and Renal Function in Participants with Type 2 Diabetes Mellitus

Author(s)
Farhan Aslam, Sanaullah Iqbal ORCID Icon, Muhammad Nasir &Aftab Ahmad Anjum

Abstract

Objectives

The study was designed to investigate the impact of white sesame seed oil (WSSO) consumption on fasting blood glucose (GLU), insulin (INS), glycosylated hemoglobin (HbA1c), and hepatic antioxidant enzymes. A secondary aim was to check the influence on serum biochemistry, hepatic, cardiac, and renal functions.

Methods

Forty-six participants with type 2 diabetes were recruited and randomly divided into two equal groups: diabetic control (DCON) and diabetic sesame oil (DSO). At baseline and 30, 60, and 90 days, blood samples were drawn and analyzed. Two-way repeated-measures analysis of variance was used to evaluate the difference between groups and across time.

Results

In both groups, GLU, INS, and HbA1c were not significantly different at baseline (mean 187.07 ± 5.63 mg/dl, mean 12.12 ± 1.03 µU/ml, and mean 7.55 ± 0.37%, respectively). At 90 days, GLU was significantly ($p < 0.05$) decreased in DSO (137.83 ± 3.16 mg/dl) when compared with DCON (218.13 ± 5.92 mg/dl), while INS was significantly increased in DSO (23.13 ± 1.15 µU/ml) as compared to DCON (7.93 ± 0.38 µU/ml). At 90 days, HbA1c was significantly lower ($p < 0.05$) in DSO as compared to DCON. Thiobarbituric acid reactive substances were significantly lower ($p < 0.05$) in DSO (1.08 ± 0.05 [MDA] nmol/ml) as compared to DCON (2.26 ± 0.07 [MDA] nmol/ml). In DSO, activities of hepatic antioxidant enzymes (superoxide dismutase, catalase, and glutathione peroxidase) increased while in DCON these activities decreased significantly ($p < 0.05$) across the time period. Biomarkers of liver, cardiac, and renal functions improved significantly in DSO as compared to DCON.

Conclusion

WSSO as a functional food may play an important role in GLU regulation and against deleterious effects of diabetes in humans with type 2 diabetes.

To get the full article, please scan the QR code

2. Sesame Oil Exhibits Synergistic Effect with Anti-Diabetic Medication in Patients with Type 2 Diabetes Mellitus

Author(s)
Devarajan Sankar a, Amanat Ali b, Ganapathy Sambandam c, Ramakrishna Rao d

Summary

Background & aims

Recently, studies have reported that sesame oil lowered blood pressure and improved antioxidant status in hypertensive and diabetic-hypertensive patients. The aim of this study was to evaluate the effectiveness of sesame oil with anti-diabetic (glibenclamide) medication as combination therapy in mild-to moderate diabetic patients.

Methods

This open label study included sixty type 2 diabetes mellitus patients divided into 3 groups, receiving sesame oil (n = 18), 5 mg/day (single dose) of glibenclamide (n = 20), or their combination (n = 22). The patients were

supplied with sesame oil [BNB Sesame oilTM] except glibenclamide group, and instructed to use approximately 35 g of oil/day/person for cooking, or salad preparation for 60 days. 12 h-fasting venous blood samples were collected at baseline (0 day) and after 60 days of the experiment for various biochemical analysis.

Results

As compared with sesame oil and glibenclamide alone, combination therapy showed an improved anti-hyperglycemic effect with 36% reduction of glucose ($P < 0.001$ vs before treatment, $P < 0.01$ vs sesame oil monotherapy, $P < 0.05$ vs glibenclamide monotherapy) and 43% reduction of HbA1c ($P < 0.001$ vs before treatment, $P < 0.01$ vs sesame oil monotherapy, $P < 0.05$ vs glibenclamide monotherapy) at the end point. Significant reductions in the plasma TC, LDL-C and TG levels were noted in sesame oil (20%, 33.8% and 14% respectively vs before treatment) or combination therapies (22%, 38% and 15% respectively vs before treatment). Plasma HDL-C was significantly improved in sesame oil (15.7% vs before treatment) or combination therapies (17% before treatment). Significant ($P < 0.001$) improvement was observed in the activities of enzymatic and non-enzymatic antioxidants in patients treated with sesame oil and its combination with glibenclamide.

Conclusions

Sesame oil exhibited synergistic effect with glibenclamide and can provide a safe and effective option for the drug combination that may be very useful in clinical practice for the effective improvement of hyperglycemia.

To get the full article, please scan the QR code

3. A Sesame Seeds-Based Breakfast Could Attenuate Sub-Clinical Inflammation in Type 2 Diabetic Patients: A Randomized Controlled Trial

Author(S)

Zahra Bahadoran, Parvin Mirmiran, Somayeh Hosseinpour-Niazi, Fereidoun Azizi

Abstract

Background and aim

The aim of this study was to investigate the effects of Tahini, a traditional functional food made from ground un-hulled sesame seeds, on glucose homeostasis parameters and serum high-sensitive reactive protein (hsCRP) in diabetic patients.

Methods

This randomized clinical trial included 41 patients with type 2 diabetes, who were randomly assigned to one of two groups: Group A (Tahini 30 g/d, n=21) and group B (control, n=20). After an initial 2-week washout period, patients in group A, replaced a part of their usual breakfast with 2 tbsp (~28 g) Tahini, while group B patients continued the usual breakfast meal for 6 weeks. Insulin and hs-CRP levels were measured, and insulin sensitivity index and homeostasis model assessment of insulin resistance index (HOMA-IR) at were calculated baseline and 6 weeks intervention.

Results

After 6-weeks, there was a significant 21.1% decrease in serum hs-CRP levels in group A. Slight but non-significant decrease in fasting serum glucose, serum insulin, insulin sensitivity index and HOMA-IR was observed during Tahini supplementation.

Conclusion

Replacing a part of regular diet with Tahini as a functional food could attenuate sub-clinical inflammation in type 2 diabetic patients.

To get the full article, please scan the QR code

4. Ardeh (Sesamum Indicum) Could Improve Serum Triglycerides and Atherogenic Lipid Parameters in Type 2 Diabetic Patients: A Randomized Clinical Trial

Author(S)
Parvin Mirmiran, Zahra Bahadoran, Mahdieh Golzarand, Asadolah Rajab, Fereidoun Azizi*

Abstract

Background
Data suggest that sesame seeds have properties beneficial to modulating lipid disorders and decreasing cardiovascular disease (CVD) risk factors. The aim of this study was to investigate the effects of Ardeh, paste of ground unhulled sesame seeds, on lipid profiles and atherogenic lipid parameters.

Methods
This randomized clinical trial included 41 patients with type 2 diabetes, who were randomly assigned to one of the two groups: group A (Ardeh 28 g/d, n = 21) and group B (control, n = 20). After an initial two-week washout period, the patients in group A, replaced a part of their usual breakfast with two tablespoon (tbsp) (~ 28 g) Ardeh, while group B patients continued the usual breakfast meal for six weeks; energy content of both breakfast meals was maintained in the same range. Anthropometric measures, blood pressure, serum levels of total cholesterol (TC), triglycerides (TG), LDL-C, HDL-C, and atherogenic index of plasma (AIP; log TG/HDL-C), TC/HDL-C ratio, and LDL/HDL-C ratio were determined at baseline and six weeks later.

Results
After six weeks, there were significant decreases in serum TG (15.3 mg/dL) and AIP (39 %) in group A. Moreover, slight decreases in serum TC, LDL-C, and other atherogenic lipid parameters and a mild increase in HDL-C also were observed during Ardeh supplementation. Anthropometric measures and blood pressure were unchanged during the study period in both groups.

To get the full article, please scan the QR code

5. The Effect of Sesame Seeds on Fast Blood Sugar, Haemoglobin A1C, Liver Enzymes and Lipid Profile in Patients with Type 2 Diabetes: A Randomized Clinical Trial

Author(S)
Athena Sadat Ghoreishi, Gelayol Chatrnour, Mehdi Mahmoodi

Authors Affiliation:
- Department of Clinical Biochemistry, Faculty of Para-Medicine, Jiroft University of Medical Sciences, Jiroft, Iran
- Independent Researcher, New Jersey, United States of America
- Department of Clinical Biochemistry, Afzalipoor Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran

Background
Diabetes is one of the most common diseases typically seen in modern societies.

Objectives
This research aimed to study the impact of consuming sesame seeds on some biochemical factors in type 2 diabetic patients.

Material and methods
This clinical trial was carried out on 60 patients diagnosed with type 2 diabetes who were assigned into the experimental (n = 30) and control groups (n = 30). The experimental group received 60 g sesame seeds per day for two months, while the control group did not receive any treatment. The demographic characteristics of patients were collected by a questionnaire-based survey method. The fasting blood sugar of patients was collected at the beginning and end of the clinical trial, and the biochemical factors were measured. For data analysis, the independent two-sample t-Test and paired t-Test were conducted using SPSS software version 20, and the level of significance was set at $p < 0.05$.

Results
In this study, the mean age of the experimental group was 52.48 ± 5.72 years old, while the average age of the control group was 56.00 ± 6.11 years old. The results showed that the serum levels of fasting blood glucose, HbA1C, cholesterol, triglycerides, low-density lipoprotein (LDL),

alanine transaminase (ALT) and alkaline phosphatase (ALP) were significantly ($p < 0.05$) decreased in the experimental group compared to the control group.

Conclusions

Regarding the harmless effects of sesame seeds, it seems that complementary therapy would be useful for the treatment and prevention of diabetes..

To get the full article, please scan the QR code

SUMMARY

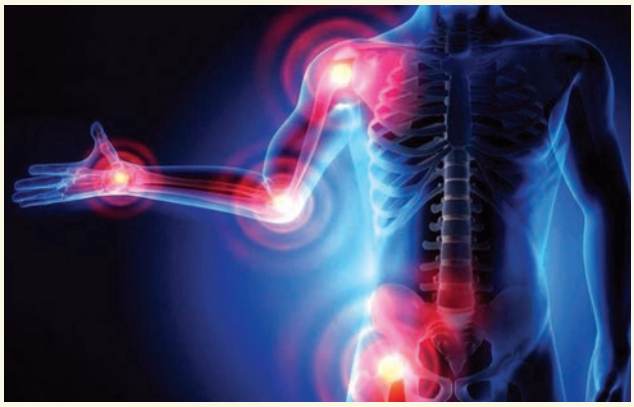
Multiple studies indicate that sesame, in its various forms, offers beneficial effects for managing type 2 diabetes. The consumption of white sesame seed oil and sesame seeds has been shown to significantly decrease fasting blood glucose and HbA1c, while also increasing insulin levels. Sesame products also improve lipid profiles, reducing total cholesterol, LDL cholesterol, and triglycerides, while increasing HDL cholesterol. Additionally, they help combat oxidative stress by reducing lipid peroxidation and boosting antioxidant enzymes. Tahini, a sesame paste, has been specifically noted to attenuate sub-clinical inflammation in diabetic patients. One study also found that sesame oil can have a synergistic effect when combined with anti-diabetic medication.

Did You Know?

A natural preservative. Sesame oil contains a potent antioxidant called sesamol, which helps prevent it from going rancid. This is why sesame oil has a long shelf life and was historically used to preserve other foods.

A currency of ancient times. In ancient Mesopotamia, sesame was so highly valued that it was used as a form of currency. It was also a highly prized oil crop in Babylon and Assyria over 4,000 years ago.

C. ANTIOXIDANT AND ANTI-INFLAMMATORY PROPERTIES



1. Sesame Lignans and Vitamin E Supplementation Improve Subjective Statuses and Anti-Oxidative Capacity in Healthy Humans with Feelings of Daily Fatigue

Author(S)
Daisuke Takemoto, Yoko Yasutake, Namino Tomimori, Yoshiko Ono, Hiroshi Shibata, Junichi Hayashi

Authors Affiliation
- Institute for Health Care Science, Suntory Wellness Ltd., Osaka, Japan
- Department of General Medicine, Kyorin University School of Medicine, Tokyo, Japan

Abstract
Sesamin has anti-oxidative functions in vivo. Fatigue is caused in part by oxidative stress. We evaluated whether sesame lignans (sesamin/episesamin = 1/1, 10 mg) with vitamin E (55 mg of α-tocopherol) (SVE) could improve subjective statuses and anti-oxidative capacity in humans using questionnaires on fatigue, sleep and physical appearance, as well as low-density lipoprotein oxidation lag time. A placebo-controlled, double-blind, parallel-group study was conducted with subjects experiencing daily fatigue. After a run-in period, subjects were administered oral SVE or a placebo (P) for 8 weeks. A questionnaire regarding fatigue, sleep and physical appearance was conducted at 0, 4, and 8 weeks. Plasma low-density lipoprotein oxidation lag time was measured as an indicator of anti-oxidative capacity. The per-protocol analysis revealed significant improvements in fatigue status at 4 and 8 weeks compared to 0 weeks in both groups ($p < 0.01$), and sleep and physical appearance at 8 weeks compared to 0 weeks only in the SVE group ($p < 0.01$). There were no significant differences observed between the groups. According to the 72-subject subgroup analysis (aged 40 and over), the sleep and physical appearance significantly improved compared to the P group ($p < 0.05$), and fatigue status showed a tendency for improvement compared to the P group. Anti-oxidative capacity in the SVE group significantly increased compared to the P group ($p < 0.01$). No adverse events relating to SVE supplementation were confirmed. These results suggest SVE supplementation could safely alleviate daily fatigue and oxidative stress.

Keywords
daily fatigue, oxidative stress, sesamin, vitamin E

Conclusion
Supplements containing sesame lignans (sesamin/episesamin = 1/1) and VE have been ingested for more than 20 years in Japan for the purpose of health maintenance and we confirmed the safety for the 5-fold doses of supplementation in a human study (Tomimori et al., 2013). In the present study we confirmed that no adverse events relating to SVE supplementation were observed. For the first time, we demonstrated that the supplementation of sesame lignans (sesamin/episesamin = 1/1) with VE could significantly improve subjective fatigue-related status and anti-oxidative capacity particularly in middle-aged and elderly people experiencing feelings of daily fatigue. These results suggest that sesame lignans with VE supplementation is safe and useful for alleviating daily fatigue and oxidative stress.

To get the full article, please scan the QR code

2. Effects of Ayurvedic Oil-Dripping Treatment with Sesame Oil vs. with Warm Water on Sleep: A Randomized Single-Blinded Crossover Pilot Study

Author(S)

Akiko Tokinobu, Takashi Yorifuji, Toshihide Tsuda, Hiroyuki Doi

Authors Affiliation

- Department of Epidemiology, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Kita-ku, Okayama, Japan.
- Department of Human Ecology, Okayama University Graduate School of Environmental and Life Science, Kita-ku, Okayama, Japan.

Abstract

Objectives

Ayurvedic oil-dripping treatment (Shirodhara) is often used for treating sleep problems. However, few properly designed studies have been conducted, and the quantitative effect of Shirodhara is unclear. This study sought to quantitatively evaluate the effect of sesame oil Shirodhara (SOS) against warm water Shirodhara (WWS) on improving sleep quality and quality of life (QOL) among persons reporting sleep problems.

Methods

This randomized, single-blinded, crossover study recruited 20 participants. Each participant received seven 30-minute sessions within 2 weeks with either liquid. The washout period was at least 2 months. The Shirodhara procedure was conducted by a robotic oil-drip system. The outcomes were assessed by the Pittsburgh Sleep Quality Index (PSQI) for sleep quality, Epworth Sleepiness Scale (ESS) for daytime sleepiness, World Health Organization Quality of Life 26 (WHO-QOL26) for QOL, and a sleep monitor instrument for objective sleep measures. Changes between baseline and follow-up periods were compared between the two types of Shirodhara. Analysis was performed with generalized estimating equations.

Results

Of 20 participants, 15 completed the study. SOS improved sleep quality, as measured by PSQI. The SOS score was 1.83 points lower (95% confidence interval [CI], −3.37 to −0.30) at 2-week follow-up and 1.73 points lower (95% CI, −3.84 to 0.38) than WWS at 6-week follow-up. Although marginally significant, SOS also improved QOL by 0.22 points at 2-week follow-up and 0.19 points at 6-week follow-up compared with WWS. After SOS, no beneficial effects were observed on daytime sleepiness or objective sleep measures.

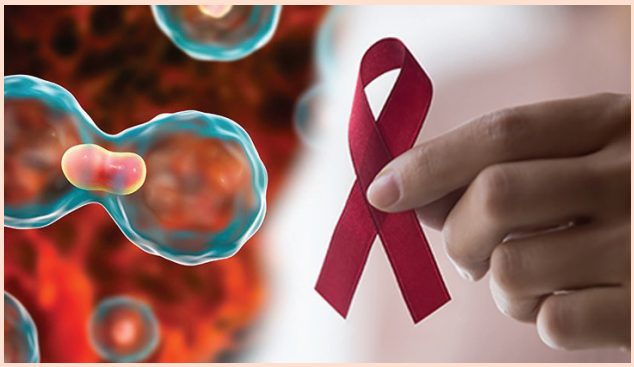
Conclusions

This pilot study demonstrated that SOS may be a safe potential treatment to improve sleep quality and QOL in persons with sleep problems.

SUMMARY

A study on sesame lignans and vitamin E supplementation showed that it can alleviate feelings of daily fatigue and improve subjective statuses related to sleep and physical appearance, especially in middle-aged and elderly individuals. The study also confirmed that this supplementation can safely increase anti-oxidative capacity and reduce oxidative stress, which is a contributing factor to fatigue. In a separate study, an Ayurvedic oil-dripping treatment (Shirodhara) using sesame oil demonstrated that it may be a safe and potential treatment to improve sleep quality and quality of life in individuals with sleep problems. This effect was more significant than a similar treatment using warm water.

D. PRECLINICAL STUDIES – ANTI-CANCER MECHANISMS



1. Sesamol Induces Mitochondrial Apoptosis Pathway in HCT116 Human Colon Cancer Cells Via Pro-Oxidant Effect

Author(S)
Munthipha Khamphio, Sahapat Barusrux, Natthida Weerapreeyakul

Abstract

Aims

Sesamol lignan is a phenolic compound found in sesame seeds. We investigated the effect of different concentrations of sesamol on oxidative stress in colorectal carcinoma cells (HCT116).

Main methods

Antioxidation in vitro was determined from elimination of the DPPH radical, ferric reducing-antioxidant power (FRAP), O2radical dot−, and peroxyl radical scavenging activity. Intracellular O2radical dot−, H2O2 and GSH levels were determined by DHE, DCFH-DA, and CMF-DA assay, respectively. Cell viability was detected by neutral red assay. Cell cycle proportion and mode of apoptotic HCT116 cells death was analyzed by flow cytometry. Apoptosis in sesamol-treated HCT116 cells was confirmed by morphological changes in the nuclei using DAPI staining and changes in mitochondrial membrane potential using the DiOC6(3) assay.

Key findings

Sesamol at both low (0.05 and 0.25 mM) and high (0.5, 2, 5, and 10 mM) concentrations concurrently reduced FRAP reagent and scavenged DPPHradical dot, and O2radical dot−. Sesamol at low concentrations scavenged ROOradical dot, but ROOradical dot-scavenging was decreased at higher concentrations. Sesamol suppressed cell viability via disruption of cell cycle progression at high concentrations (0.5, 1, 2, and 5 mM), thereby causing S-phase arrest and inducing apoptosis—through the production of intracellular O2radical dot−, mitochondrial dysfunction, and DNA fragmentation.

Significance

High concentrations of sesamol induced the mitochondrial apoptosis pathway in human colon cancer HCT116 cells via a pro-oxidant effect.

To get the full article, please scan the QR code

2. Sesamin Acts as Anti-leukemic Compound Interacting with Novel Phosphoprotein Targets and Inducing Apoptosis in Leukemic Cells

Author(S)
Pattharin Wannapruk, Kamolchanok Deesrisak, Sittiruk Roytrakul, Dalina Tanyong

Authors Affiliation

- Department of Clinical Microscopy, Faculty of Medical Technology, Mahidol University, Thailand.
- National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency (NSTDA), Thailand.

Abstract

Leukemia is one of the high-incidence cancers that is characterized by an abnormal production of immature white blood cells. Subject to many reports on the side effects of conventional chemotherapy, herbs and natural compounds have been studied as an alternative medicine. In this study, sesamin, a lignan in sesame seed with pharmaceutical functions including anti-cancer, was chosen and treated with MOLT-4 and NB4 leukemic cell lines in various concentrations for 24 and 48 hours. The effect of sesamin on cell inhibition and expression levels

of apoptotic genes in leukemic cell lines were investigated by MTT assay and real-time PCR, respectively. Moreover, apoptotic proteins were studied by mass spectrometry and bioinformatics tools to investigate the relation between sesame and targeted proteins. Results showed that sesamin increased cell inhibition in both cell lines in dose- and time-dependent manner. Levels of caspase-3, -7, -8, and -9 gene expressions significantly increased, while BCL-2 decreased drastically in sesamin-treated cells. From bioinformatics study, PARP4, IPPK and caspase family proteins were found to be involved in sesamin that induced apoptosis in leukemic cells. Besides, doxorubicin, a chemotherapeutic drug, also shared the same protein targets as sesamin in apoptosis pathway. Sesamin demonstrates its potential to enhance cell inhibition and promotes cell apoptosis in both MOLT-4 and NB4 leukemic cell lines. This study will benefit the development of sesamin as an effective anti-leukemia drug in the future.

Conclusion

In conclusion, sesamin possesses an ability to enhance cell inhibition and promotes cell apoptosis in both MOLT-4 and NB4 leukemic cell lines in dose- and time-dependent manner with no significant decrease of the cell viability in normal PBMCs. The induction and execution of apoptosis process demonstrated that sesamin treatment in MOLT-4 and NB4 were involved in caspase-dependent apoptosis signaling pathway. This study reports on the effect of sesamin playing a role in apoptosis pathway through BCL-2, caspase family proteins, PARP4, and IPPK in MOLT-4 and NB4 leukemic cell. Additionally, sesamin was found to share the same target proteins with doxorubicin, which suggests potential use of sesamin in reducing the side effects or synergizing the cytotoxic effect of doxorubicin in leukemic patients. In the future, sesamin could be possibly developed as an alternative drug for leukemia treatment. However, further investigation on in vivo study or clinical samples is required.

To get the full article, please scan the QR code

3. Sesamin Induces Cell Cycle Arrest and Apoptosis through the Inhibition of Signal Transducer and Activator of Transcription 3 Signalling in Human Hepatocellular Carcinoma Cell Line HepG2

Author(S)

Pengyi Deng, Chen Wang, Liulin Chen, Cheng Wang, Yuhan Du, Xu Yan, Mingjie Chen,
Guangxiao Yang, and Guangyuan He

Authors Affiliation

- The Genetic Engineering International Cooperation Base of Chinese Ministry of Science and Technology,
- Key Laboratory of Molecular Biophysics of Chinese Ministry of Education, College of Life Science and Technology,
- Huazhong University of Science & Technology (HUST); Wuhan 430074, P.R. China.

Abstact

Sesamin, one of the most abundant lignans in sesame seeds, has been shown to exhibit various pharma-cological effects. The aim of this study was to elucidate whether sesamin promotes cell cycle arrest and in-duces apoptosis in HepG2 cells and further to explore the underly ing molecular mechanisms. Here, we found that sesamin inhibited HepG2 cell growth by inducing G2/M phase arrest and apoptosis. Furthermore, sesa-min suppressed the constitutive and interleukin (IL)- 6-induced signal transducer and activator of transcrip-tion 3 (STAT3) signalling pathway in HepG2 cells, leading to regulate the downstream genes, including p53, p21, cyclin proteins and the Bcl-2 protein family. Our studies showed that STAT3 signalling played a key role in sesamin-induced G2/M phase arrest and apoptosis in HepG2 cells. These findings provided a molecu-lar basis for understanding of the effects of sesamin in hepatocellular carcinoma tumour cell proliferation. Therefore, sesamin may thus be a potential chemotherapy drug for liver cancer.

Key words

sesamin; signal transducer and activator of transcription 3; HepG2 cell; cell cycle; apoptosis

Conclusion

In conclusion, we have provided evidence that sesamin has the ability to suppress the STAT3 signalling pathway

in HepG2 cells, leading to the decrease of cell prolifera-tion through G2/M phase arrest and inducing apoptotic. The results in this study also provide evidence for sesamin as a potential STAT3 inhibitor and therapeutic compound for the treatment of hepatocellular carcinoma

To get the full article, please scan the QR code

SUMMARY

Sesamol, a phenolic compound found in sesame seeds, has been shown to induce apoptosis in HCT116 human colon cancer cells through a pro-oxidant effect. At high concentrations, it leads to cell cycle arrest and DNA fragmentation. Sesamin, another lignan in sesame, demonstrates potential anti-leukemic properties. In studies with MOLT-4 and NB4 leukemic cell lines, sesamin enhanced cell inhibition and promoted cell apoptosis in a dose- and time-dependent manner. It was also found to share some of the same protein targets as doxorubicin, a common chemotherapy drug, suggesting its potential use in combination therapy to reduce side effects or synergize with the drug. Additionally, sesamin has been shown to inhibit the growth of human hepatocellular carcinoma cells (HepG2) by inducing G2/M phase arrest and apoptosis through the suppression of the STAT3 signaling pathway. These findings provide a molecular basis for sesamin's potential as a therapeutic compound for liver cancer.

SESAME
Fact Files

Experimental projects in Africa have studied sesame oil as a potential biodiesel source.

The sesame genome was first sequenced in 2014, helping scientists develop high-yield, stress-tolerant varieties.

Unhulled sesame seeds contain nearly twice as much calcium as milk (per gram) — making them a mineral powerhouse.

E. DERMATOLOGY & SKIN HEALTH APPLICATIONS

1. Clinical And Instrumental Study of the Efficacy of a New Sebum Control Cream

Author(S)
Hristo Dobrev

Authors Affiliation
Department of Dermatology, Medical University, Plovdiv, Bulgaria.

Abstract

Background

Some botanical compounds are considered useful to reduce sebum production. Aim To evaluate the efficacy of a sebum control cream containing polyphenol-rich extract from saw palmetto, sesame seeds, and argan oil in subjects with oily facial skin.

Methods

The study was carried out during the winter months (January and February). A total of 20 healthy volunteers (9 male and 11 female, aged 17-50 years, 16 with oily skin and 4 with combined skin) were studied. The test product was applied twice daily to the face for a period of 4 weeks. A clinical assessment and instrumental measurements were done before and after the treatment period. Casual sebum level on the forehead and both cheeks was determined with a photometric device (Sebumeter). The quantity of sebum on the midforehead was determined using sebum collector foils (Sebufix), which were then evaluated with skin camera Visioscope and software SELS (Surface Evaluation of the Living Skin). A subjective evaluation questionnaire regarding the cosmetic characteristics, tolerance, and efficacy of the product was filled out by the volunteers at the end of study.

Results

The product was very well accepted by all the volunteers. A visible sebum-regulating efficacy was reported in 95% of them. After 4 weeks of treatment, the clinical assessment scores decreased by 33%. There was a significant reduction in the casual sebum level by 20% and area covered with oily spots by 42%. The number of active sebaceous glands remained unaltered.

Conclusion

These results objectively and quantitatively show the efficacy of the sebum control cream tested to reduce the greasiness and improve the appearance of oily facial skin.

To get the full article, please scan the QR code

2. Efficacy of sesame oil versus placebo in the management of acute radiation-induced dermatitis in breast cancer patients: A double-blind randomized clinical trial

Author(S)
Dariush Moslemi , Sepehr Ramezany, Ali Akbar Moghadamnia , Saba Ebrahimian

Abstract

Aim

Considering the anti-inflammatory and positive effects of sesame oil in treating skin diseases, the present research aimed to study its therapeutic effects on acute radiotherapy dermatitis in such patients.

Methods

Forty women with breast cancer during radiotherapy (for 5 weeks) were randomly grouped into two categories: sesame oil (20 patients) and placebo (20 patients). After each radiotherapy session, they were asked to use 3cc of the ointment on the treating field and continue the treatment until the end. They were examined weekly according to the staging criteria of the radiation therapy oncology group.

Results

No significant difference was observed in the first 3 weeks. In the fourth week, dermatitis grade 0 was 35%, grade 1 was 65%, and grade 2 was 0% in the intervention (case) group, while in the control group, they were 10%, 75%, and 15%, respectively. This difference was statistically significant ($p = 0.046$). Also, in the fifth week in the case group, dermatitis grade 0 was 25%, grade 1 was 70%, and grade 2 was 5%, while in the control group, they were 0%, 80%, and 20%, respectively. This difference was also statistically significant ($p = 0.032$).

Conclusion

Based on the findings, sesame oil, as a cheap and available herbal treatment, may be utilized in treating acute dermatitis caused by radiotherapy. However, an investigation with a larger sample size in several centers should be conducted to examine sesame oil effects in treating acute radio dermatitis more comprehensively.

Keywords

acute radiation dermatitis; breast cancer; sesame oil.

To get the full article, please scan the QR code

SUMMARY

A clinical study from Bulgaria showed that a cream containing sesame seed extract, saw palmetto, and argan oil reduced facial oiliness, lowering sebum levels by 20% and oily spots by 42% over four weeks, with high user satisfaction. In another randomized trial, sesame oil significantly decreased the severity of radiation-induced dermatitis in breast cancer patients during weeks four and five of radiotherapy compared to placebo. Both studies highlight sesame's potential as an effective, safe, and affordable ingredient for skin health and supportive care.

SESAME - TITBITS

In ancient Egypt, sesame seeds were buried with pharaohs as symbols of immortality and protection.

In Japan, roasted sesame sprinkled on sushi is not just for flavor- it's also a symbol of luck and prosperity.

In Sudanese weddings, sesame seeds are sometimes showered on the bride as a sign of fertility and prosperity.

F. ELDERLY WELL-BEING

1. Effect of Black Sesame Seeds (Sesamum indicum L.) Consumption on Sleep Quality among Thai Elderly

Author(S)
Saifon Saisum, Chatrapa Hudthagosol, Suwat Srisorrachatr

Authors Affiliation
- Department of Nutrition, Faculty of Public Health, Mahidol University
- Siam Technology College

Abstract
Insomnia remains one of the most common sleep disorders encountered among the elderly. and overall prevalence of insomnia symptoms ranges from 30–48%. In Thailand, the prevalence of insomnia among the elderly has been reported at 46.3%. Currently studies, black sesame seed can be a source of micronutrient (These nutrients include minerals and vitamins) that may impact important nerve–signaling chemicals or neurotransmitters of sleep regulation, including serotonin, NDMA, glutamate, and melatonin secretion. The present study aimed to investigate the effects of black sesame seeds consumption on sleep quality among Thai elderly. The study was performed as a randomized controlled clinical trial with 3 paralleled groups (2 intervention and 1 control group) over 12 weeks. Sleep quality assessed by questionnaire The Pittsburgh sleep quality index: PSQI The results showed that sleep quality increased significantly among subjects consuming 20 g/d of black sesame seeds (powdered roasted black sesame) daily for 12 weeks (P=0.006) compared with the control group (0.90) and no adverse events relating to black sesame seeds were confirmed. In the future, black sesame seeds could be consumed as a supplement for a safe potential treatment to improve sleep quality and for those who have sleep problems

To get the full article, please scan the QR code

2. Effects of Black Sesame-Fortified Pudding Consumption on Psychological Stress of Community-Dwelling Older Persons

Author(S)
Kukiat Tudpor1, Prapatson Sringaokham Napaphat Thaweesak Patcharin Reunthong2, Thanarat Laoakka3

Abstract
Psychological stress in the older persons is an important issue that requires awareness. Functional food might help reduce psychological stress. Lignans in sesame seeds have been reported to reduce stress hormone. This research was aimed to study effects of black sesame-fortified pudding on stress levels in community-dwelling persons. Forty-five volunteers aged ≥ 60 years old with no underlying diseases, and stress index ≥ 35 (primary stress) were divided into a control (consumed normal pudding, n=24) and experimental (consumed black sesame (15-gram)-fortified pudding, n=21). Before and 24-h after the experiment, stress index and heart rate variability (HRV) values (sympathetic proxies: low frequency (LF), low frequency/high frequency ratio (LF/HF ratio, and pulse; and parasympathetic proxies: high frequency (HF), standard deviation of the normal-to-normal intervals (SDNN) and square root of the mean squared differences of successive normal R-R intervals (RMSSD) were measured by sphygmograph device. Results showed that after 24 h, stress index in the experimental group significantly reduced, but unchanged in the control group. Sympathetic proxies were unchanged in both groups. Meanwhile, HF value in the experimental group significantly increased compared to baseline and the control group. In conclusion, sesame consumption was able to reduce psychological stress in older persons. Lignans in sesame seeds like sesamin, sesamol, and sesamolin might reduce stress

hormone levels, resulting in lowered stress index. Exact mechanisms still have to be further investigated.

Conclusion and Discussion

This research demonstrates that the consumption of black sesame can help reduce stress levels in the elderly. Lignans found in black sesame, such as sesamin, sesamol, and sesamolin, may help lower cortisol levels, thereby reducing stress index scores. These findings could serve as a guideline for promoting health and nutrition among elderly individuals in communities.

To get the full article, please scan the QR code

SUMMARY

A randomized trial in Thailand found that daily consumption of 20 g of black sesame seeds for 12 weeks significantly improved sleep quality in elderly participants, with no adverse effects. Another study showed that black sesame-fortified pudding reduced psychological stress in older adults, lowering stress index scores and improving heart rate variability. Both studies suggest that black sesame, rich in lignans and micronutrients, may offer safe, functional food-based approaches to enhance sleep and mental well-being in the elderly.

Did You Know?

The "Queen of Oils." In traditional Indian medicine (Ayurveda), sesame oil is often referred to as the "Queen of Oils" and is a base for many medicinal preparations due to its warming and nourishing properties.

A natural insect repellent. Historically, sesame oil was used as an effective natural insect repellent, particularly for lice and other pests.

G. WOMEN HEALTH

1. The Impact of Sesame Oil on Postpartum After-Pain in Multiparous Women: A Randomised, Triple-Blind, Placebo-Controlled Clinical Trial

Author(S)

Mahdis Mehrabi Bardar a, Fatemeh Zahra Karimi b c, Seyed Reza Mazloum b, Roshanak Salari

Authors Affiliation

- School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
- Nursing and Midwifery Care Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran
- Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
- Department of Pharmaceutical Sciences in Persian Medicine, School of Persian and Complementary Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Results

After the intervention, the mean scores of pain intensity ($P < 0.001$), emotional pain ($P < 0.001$), physical pain ($P < 0.001$) and total pain ($P < 0.001$) in the group that received sesame oil soft gels were significantly lower than those in the placebo group.

To get the full article, please scan the QR code

H. OTHER HEALTH BENEFITS

1. Consumption of Sesame Oil Muffins Decreases the Urinary Excretion of γ-Tocopherol Metabolites in Humans

Author(s)

Jan Frank, Afaf Kamal-Eldin, Maret G. Traber

Abstract

Sesame seed and oil consumption previously increased human plasma γ-tocopherol (γ-T) concentrations. This was attributed to the sesame lignans sesamin and sesamolin. Here, we studied the inhibition of vitamin E metabolism by a single dose of sesame oil lignans coingested with deuterated α- and γ-tocopherols in human volunteers. The urinary excretion of γ-T metabolites was significantly lower in sesame oil treated than in control subjects. Concentrations of tocopherols in blood were not affected by the treatment. In conclusion, a single dose of sesame oil, containing 136 mg sesame lignans (sesamin and sesamolin), reduces the urinary excretion of co-administered γ-T in humans.

Conclusion

Black sesame seeds exhibit high nutritive and therapeutic qualities. Sesame is a rich source of macronutrients and micronutrients including proteins, dietary lignans, vitamins, calcium, phosphorous and in future, could be consumed as a supplement for a safe potential treatment to improve sleep quality and for those who have sleep problems.

To get the full article, please scan the QR code

II. GENERAL STUDIES AND REVIEWS

1. The Effects of Sesamin Supplementation on Obesity, Blood Pressure, and Lipid Profile: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Author(s)

Yiting Sun, Jingyi Ren, Siqi Zhu, Zhenao Zhang, Zihao Guo, Jiaqi An, Bowen Yin, Yuxia Ma

Author Affiliations

- Undergraduate of College of Basic Medicine, Hebei Medical University, Shijiazhuang, China.
- Department of Nutrition and Food Hygiene, School of Public Health, Hebei Medical University, Hebei Province Key Laboratory of Environment and Human Health, Shijiazhuang, China.
- Undergraduate of College of Public Health, Hebei Medical University, Shijiazhuang, China.

Abstract

Aims

Sesamin, the main lignin constituent of sesame, plays a pivotal role in regulating physical state. Some studies have evidenced that the supplementation of sesamin may decrease cardiovascular disease risk. The goal of this systematic review was to summarize evidence of the effects of sesamin supplementation on obesity, blood pressure, and lipid profile in humans by performing a meta-analysis of randomized controlled trials.

Data synthesis

Five databases (PubMed, Cochrane Library, EMBASE, Web of Science, and Scopus) were searched electronically from inception to July 2021 to identify randomized controlled trials that assessed the impact of sesamin on obesity, blood pressure, and lipid profile. Weighted mean difference (WMD) and standard deviation (SD) were used to present the major outcomes.

Conclusions

Seven trials (n = 212 participants) were included in the overall analysis. Results showed that sesamin supplementation caused a great reduction in TC (WMD: -10.893 mg/dl, 95% CI: -19.745 to -2.041, p = 0.016), LDL-c (WMD: -8.429 mg/dl, 95% CI: -16.086 to -0.771, p = 0.031), and SBP (WMD: -3.662 mmHg, 95% CI: -6.220 to -1.105, p = 0.005), whereas it had no effect on HDL-c, TG, DBP, or weight. Subgroup analysis showed that duration, parallel design, and unhealthy status can affect TC, LDL-c, and SBP evidently. We did not discover a strong link between indicators' changes and duration of supplementation. Sesamin can be used as an obtainable dietary supplement to improve blood pressure and blood lipids, and further as a health product to prevent cardiovascular diseases.

To get the full article, please scan the QR code

2. Physicochemical, Potential Nutritional, Antioxidant and Health Properties of Sesame Seed Oil: A Review

Author(S)

Edwige Bahanla Oboulbiga, Zoénabo Douamba, Diarra Compaoré-Sérémé, Judith Nomwendé Semporé, Rasmata Dabo, Zénabou Semde, Fidèle Wend-Bénédo Tapsoba, Fatoumata Hama-Ba, Laurencia T. Songré-Ouattara, Charles Parkouda, Mamoudou H. Dicko

Authors Affiliation

- Food Technology Department (DTA), Institute for Research in Applied Sciences and Technologies (IRSAT), National Center for Scientific and Technological Research (CNRST), Ouagadougou, Burkina Faso
- Laboratory of Biochemistry, Biotechnology, Food Technology and Nutrition (LABIOTAN), Department of Biochemistry and Microbiology, University Joseph KI ZERBO, Ouagadougou, Burkina Faso]

Abstract

Sesame (Sesanum indicum L.) is one of the primary annual oilseeds grown in Africa and Asia. Sesame seed oil (SSO) is of great economic and human nutrition interest worldwide. Due to its composition in phytochemical antioxidants and profile in unsaturated fatty acids, sesame is used as a biological source of essential fatty acids. It contains bioactive compounds such as lignans (sesamin, sesamol, sesamolin), tocopherols and phytosterols. The oleic/linoleic fatty acids ratio of sesame makes it important for human health. SSO has bioactive compounds that can help prevent certain cardiovascular, metabolized and coronary diseases. The ω-3 and ω-6 fatty acids in SSO are precursors to eicosanoids that regulate the immune system and inflammatory functions. The essential fatty acids contained in this oil are essential for cell construction and highly recommended during the first trimester of pregnancy. The consumption of SSO allows both a decrease in the LDL-cholesterol complex and an increase in the HDL-cholesterol complex. It regulates blood sugar and may have favorable effects on people with liver cancer and those developing fatty liver disease. In this review, the nutritional value, antioxidant properties, and health benefits of SSO have been compiled to provide collective information of nutritional and medical interest.

Conclusion

Sesame seed oil (SSO) has a nutritionally rich composition in antioxidants and specific bioactive compounds such as lignans (phytosterols, tocopherols, sesamin and sesamolin, etc.). Its high antioxidant activity makes it a unique and very good quality functional food that may have positive effects on human health. Like whole seeds, extracted oil is rich in bioactive compounds. Its consumption may help to fight inflammation-related diseases such as osteoarthritis, cardiovascular diseases, neurodegenerative diseases, inflammatory bowel diseases, diabetic eye diseases, lung diseases, liver diseases, skin diseases and Alzheimer's disease. SSO may be considered as edible oil containing high level of nutraceuticals.

To get the full article, please scan the QR code

3. The Impact of Sesame Seeds on Human Health

Author(S)

Shahad Layth Abdulkhaleq

Authors Affiliation

Faculty of Pharmacy, The University of Mashreq, Baghdad, Iraq

Abstract

Sesame seeds, scientifically known as Sesamum indicum L., have been farmed for millennia and are highly regarded for their wide range of uses in cooking. In addition to their pleasant nutty taste and crispy consistency, sesame seeds have also been acknowledged for their extraordinary nutritional advantages. This article offers a comprehensive analysis of the various ways in which sesame seeds contribute to general health and wellness. Sesame seeds contain a variety of phytochemicals, such as lignans derivatives, tocopherol isomers, phytosterols, and phytates. These compounds have been linked to several health advantages, including the protection of cardiovascular health and the prevention of cancer, neurodegenerative disorders, and brain dysfunction. These chemicals have also been confirmed for their effectiveness in managing cholesterol. Their capacity as a natural reservoir of advantageous botanical chemicals is

thoroughly elucidated. The article delves deeper into the beneficial effects of sesame seeds in lowering the likelihood of chronic diseases due to their abundant polyunsaturated fatty acids. However, it is important to recognise the importance of keeping a diverse diet in order to attain the appropriate equilibrium of n-3 and n-6 polyunsaturated fatty acids, which is deficient in sesame seed oil. The text explores the importance of bioactive polypeptides extracted from sesame seeds, highlighting their potential uses as nutritional supplements, nutraceuticals, and functional components. This review examines the impact of processing procedures on sesame seeds and how they can affect the presence and activity of bioactive chemicals. Roasting the seeds improves the antioxidant qualities of the oil extract, however, some processing methods may decrease phenolic components.

Summary and Prospects for the Future

The recent studies have provided extensive evidence that consuming sesame seeds, which are rich in bioactive components, offers several health benefits. Sesame seed-derived lignans have a wide range of potential therapeutic uses, including improving cognitive health, treating cardiovascular disease, cancer, and inflammation-related illnesses. Incorporating tocopherols extracted from sesame seeds can enhance the antioxidant capabilities of functional health meals. These molecules operate as antioxidants and can neutralise the harmful effects of reactive oxygen species, thereby protect cell membranes and avoid disorders like cancer and cardiovascular diseases. Phytosterols are frequently added to functional foods designed to help control cholesterol levels. Multiple studies have shown that they can effectively decrease blood cholesterol levels, boost the immune system, and lessen the likelihood of some types of cancer. Phytates are recognised for their ability to impede mineral absorption, but they also possess potential hypocholesterolaemia and anticancer effects. Multiple studies also demonstrate the abundance of unsaturated fatty acids, including linoleic and oleic acid, in sesame oil, which enhances its potential to promote good health. Sesame seeds, which contain abundant oil and protein, are a good source of protein hydrolysates. These hydrolysates have various applications, including their potential use as functional components in nutraceuticals and functional meals. This is due to their bioactive peptides, which include antioxidant and antihypertensive characteristics. These findings emphasise the importance of including sesame seeds in one's diet and the possibility of using them to create dietary supplements and functional food products. Promoting the widespread use of sesame among consumers and food manufacturers is essential. Further investigation is crucial to explore the advantageous health impacts of the phytochemicals found in sesame, to comprehensively comprehend their mechanisms, and to evaluate their therapeutic effectiveness in addressing different health issues.

To get the full article, please scan the QR code

4. Black Sesame Seeds: Nutritional Value, Health Benefits, and Food Industrial Applications

Author(S)

Zhenxia Xu, Min Li, Nanjie Jiang, Changqing Gui, Yunhai Wang, Yuting An, Xia Xiang, Qianchun Deng

Objective

The study aims to provide a comprehensive overview of black sesame seeds (BSS), focusing on their nutritional composition, health benefits, and applications in the food industry.

Authors Affiliation

Oil Crops Research Institute of Chinese Academy of Agricultural Sciences, Oil Crops and Lipids Process Technology National & Local Joint Engineering Laboratory, Key Laboratory of Oilseeds Processing, Ministry of Agriculture and Rural Affairs, Hubei Key Laboratory of Lipid Chemistry and Nutrition, Wuhan, Hubei, 430062, Chin School of Life Sciences and Health, Hubei University of Technology, Wuhan, Hubei, 430068, China Natural Food International Group Limited, Shenzhen, Guangdong, 511458, China

Background

Black sesame seeds (BSS) have been considered a traditional health food with notable nutritional value and pharmacological properties for centuries, particularly in Asian countries like China. The growing demand for natural and functional foods has driven the market development of BSS products. Fully understanding the phytochemical

constituents and biological activities of BSS advances its high-value utilization.

Key findings and conclusions

BSS has a diverse nutritional profile, encompassing proteins, lipids, lignans, minerals, black pigments, and vitamins, with their content varying by cultivar and processing conditions. As an excellent nutritional resource of food, BSS exhibits prominent bioactivities demonstrated in animal and in vitro studies, including antioxidant, anti-cancer, anti-inflammatory, hepato and nephro protective and anti-obesity, neuroprotective, antidepressant, as well as lowering blood pressure and anti-diabetic effects. BSS also holds promise for various applications in the food industry, from nutritional supplements to innovative food packaging solutions. It is widely appreciated for its organoleptic properties and associated health benefits, making it an important ingredient in numerous food formulations, including sauces, bakery and dairy products, and beverages. Finally, the review indicates that better utilization of BSS is hindered by inadequate component analysis, limited health benefits research, lack of clinical studies on biological activities and toxicity, and the need for investigation into the effects of processing conditions on health-promoting properties.

Graphical abstract

To get the full article, please scan the QR code

5. Nutritional Profiling and Sensory Attributes of Sesame Seed-Enriched Bars

Author(S)

Zainab Irshad, Muhammad Aamir, Noor Akram, Aasma Asghar, Farhan Saeed, Aftab Ahmed, Muhammad Afzaal, Huda Ateeq, Yasir Abbas Shah, Zargham Faisal, Mohammad Rizwan Khan, Rosa Busquets & Degnet TeferiAsres

Authors Affiliation

- National Institute of Food Science and Technology, University of Agriculture Faisalabad, Faisalabad, Pakistan;
- Department of Food and Nutrition, Government College University Faisalabad, Faisalabad, Pakistan
- Department of Nutritional Sciences, Government College University Faisalabad, Faisalabad, Pakistan; of Food Science,
- Government College University Faisalabad, Pakistan;
- Natural & Medical Science Research Center, University of Nizwa,
- Birkat Al Mawz i-Bahir Dar, Oman;
- Department of Human Nutrition, Bahauddin Zakariya University Multan, Multan, Pakistan;
- Department of Chemistry, College of Science, King Saud University, Riyadh, Saudi Arabia;
- School of Life Sciences, Pharmacy and Chemistry, Kingston University London, Kingston, UK;
- Bahir Dar Food and Nutrition Research, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia

Abstract

Sesame belongs to the family Pedaliaceae and is scientifically named Sesamum indicum L. It has been considered as one of the most ancient oil crops. To explore the nutraceutical and therapeutic potential of sesame seeds, the present study was planned to develop protein-enriched sesame bars with the addition of barley flour at the rate of 10%, 20%, and 30% among treatments T1, T2, and T3, respectively. Sesame barley-supplemental protein (SBSP) bars were analyzed for compositional, phytochemical, and sensory attributes including colour, texture, taste, holding ability, and overall acceptability. The proximate analysis of all treatments showed a varied range of results moisture (4.68 ± 0.45%), ash (3.66 ± 0.09%), crude fat (11.48 ± 0.12%), crude protein (42.37 ± 0.66), crude fibre (4.63 ± 0.23%), and nitrogen-free extract (26.29 ± 0.26%), respectively. Results of mineral analysis of all treatments were recorded as calcium (51.88–86.92 mg), iron (3.48–8.48 mg), potassium (359.35–639.20 mg), magnesium (28.23–47.54 mg), and phosphorus (151.03–378.81 mg). The results of total phenolic content ranged from 37.58 to 99.43 mg GAE/100 g, while the results for the total flavonoid content fall in the range from 110.85 to 196.50 mg CE/100 g. The DPPH results illustrated that the highest content of DPPH was present in T2 (8.81 ± 0.13), while the lowest DPPH value was noticed in T0 (5.62 ± 0.08). Based on sensory evaluation, the T3 SBSP bar was preferred containing 25% barley flour and 75% sesame flour for its attractive color, texture, and overall acceptability.

Methods

The current research was conducted at the National Institute of Food Science and Technology (NIFSAT),

University of Agriculture, Faisalabad. White sesame seeds in raw form were purchased from Ayub Agriculture Research Institute (AARI), Faisalabad. Barley flour, jaggery, and other materials for the development of protein bars were purchased from a local market of Faisalabad. Sesame seeds were manually cleaned to remove damaged seeds, dirt particles, and other contaminants; seeds were washed and sun-dried. Then sesame seeds and barley flour were weighed as in the treatment plan (Table 1) and transferred into polyethylene pouches for product development and further analysis. T0 was considered as a control group with 0% sesame seeds, whereas T1, T2, T3, and T4 were fortified with sesame seeds as 25%, 50%, 75%, and 100%, respectively.

Conclusion

According to the findings of this research, a supplementation of sesame flour of up to 75% improves the nutritional qualities of bars, while the greatest level of sensory evaluation was also found at the 75% level of substitution. The group of judges preferred T3 the best out of all the treatments based on the sensory attributes it possessed, followed by T0, T1, T2, and T4 in that order. T4 was the least popular treatment. The proportion of treatments that were deemed appropriate (T3) was 25:75 as barley flour: sesame seed powder. The incorporation of sesame seed flour resulted in a substantial improvement to the overall nutritional profile. However, the active components of barley and sesame seeds can be isolated and employed in a wide variety of food products, including not only other native fermented foods but also other traditional and indigenous fermented foods. However, it has been concluded as a very simple approach to overcome the burden of protein energy malnutrition.

To get the full article, please scan the QR code

SUMMARY

Sesame seeds are a rich nutritional source, containing proteins, lipids, minerals, and vitamins. They are particularly noted for their content of bioactive compounds such as lignans (sesamin, sesamol), tocopherols, and phytosterols, all of which contribute to their health benefits.

The consumption of sesame and its derivatives, such as sesamin and sesame seed oil, has been linked to various positive health outcomes. These include improving blood pressure and blood lipids, which can help prevent cardiovascular diseases. Sesame's antioxidant properties are also highlighted, with tocopherols and lignans helping to neutralize reactive oxygen species. This antioxidant effect is believed to be beneficial in combating various inflammation-related and neurodegenerative diseases.

Furthermore, processing methods can influence the final product's properties. For example, roasting sesame seeds can enhance the antioxidant qualities of the extracted oil. The development of food products like protein-enriched sesame bars has also been explored, demonstrating that incorporating sesame flour can significantly improve the nutritional profile and make it a simple approach to combat protein energy malnutrition.

III. SESAME AND ITS MULTIFACETED USES

The humble sesame seed, Sesamum indicum, is a testament to the fact that immense value can be found in the smallest packages. While the clinical trials and scientific studies that form the core of this book are a modern endeavor, the story of sesame is ancient and global. From its origins as a resilient crop in arid lands to its role as a culinary cornerstone, a traditional medicine, and an industrial asset, sesame has been woven into the fabric of human culture for thousands of years.

I. Culinary Applications: A Global Gastronomic Staple

Sesame's most common and beloved role is in the kitchen. Its rich, nutty flavour is a cornerstone of global cuisine, serving as a pillar of both savory and sweet dishes and offering a unique sensory experience.

- **Whole and Ground Seeds:** Whole sesame seeds are a versatile ingredient, available in hulled and unhulled varieties. Toasted seeds undergo the Maillard reaction, which develops a deep, nutty flavour and a satisfying crunch. They are a quintessential garnish for a vast array of dishes, from Asian stir-fries and sushi to Middle Eastern salads. Untoasted seeds, with their milder, almost sweet flavour, are often used in baking. In Japan, toasted sesame seeds are ground with salt to create gomasio, a flavourful condiment.
- **Sesame Oil:** The oil extracted from sesame seeds is a staple across many cultures, with two distinct varieties. Light or cold-pressed sesame oil, made from untoasted seeds, has a neutral flavour and a high smoke point (approximately 210oC or 410oF), making it suitable for high-heat cooking like frying and sautéing. In contrast, toasted or dark sesame oil, produced from toasted seeds, has a powerful, nutty aroma and a lower smoke point. It is primarily used as a finishing oil, adding a final burst of flavor to dishes.
- **Tahini (Sesame Paste):** Tahini is a smooth, creamy paste made from ground sesame seeds, and its consistency can range from thick and pasty to a thinner, pourable liquid. It is a foundational ingredient in Middle Eastern and Mediterranean cooking, a non-negotiable component of classics like hummus and baba ghanoush. Thinned with water and lemon juice, tahini forms the basis of a versatile emulsion for dressings and sauces.
- **Confections and Specialty Foods:** Sesame is also a key ingredient in numerous sweets. Halva, a dense, sweet confection, is made primarily from tahini and sugar. In India, **til ladoo** are energy-rich balls made from sesame seeds and jaggery, traditionally exchanged during festivals.

II. Nutritional Profile and Healthy Food Applications

Beyond its flavour, sesame is celebrated for its dense nutritional profile, which positions it as a "superfood" in modern health discourse.

1. Nutritional Composition of Sesame Seeds

Table 1.1 Macronutrients

Component	Amount / Description
Energy	573 kcal
Protein	17.7 g
Total Fat	49.7 g
- Saturated Fat	7 g
- Monounsaturated Fat	18.8 g
- Polyunsaturated Fat	21.8 g
Carbohydrates	23.4 g
- Dietary Fiber	11.8 g
- Sugars	0.3 g

1.2 Vitamins

Component	Amount / Description
Vitamin B1 (Thiamine)	0.79 mg (66% DV)
Vitamin B2 (Riboflavin)	0.25 mg (21% DV)
Vitamin B3 (Niacin)	4.5 mg (28% DV)
Vitamin B6	0.79 mg (61% DV)
Folate (B9)	97 µg (24% DV)
Vitamin E	0.25 mg
Vitamin A & C	Trace amounts

1.3. Minerals

Component	Amount / Description
Calcium	975 mg (~100% DV)
Iron	14.6 mg (81% DV)
Magnesium	351 mg (88% DV)
Phosphorus	629 mg (90% DV)
Potassium	468 mg
Zinc	7.8 mg (71% DV)
Copper	4.1 mg (204% DV)
Manganese	2.5 mg (108% DV)
Selenium	34.4 µg

Notes:
- *All nutritional values are for 100 grams of hulled, dried sesame seeds and are based on data from the USDA FoodData Central database.*
- *The Daily Value (DV) percentages are based on a standard 2,000-calorie daily diet. Individual needs may vary.*

2. Phytochemicals & Antioxidants

- Sesamin, Sesamolin, Sesamol (Lignans with antioxidant and anti-inflammatory properties)
- Phytosterols: Shown to reduce cholesterol absorption
- Polyphenols: Natural antioxidants that support cardiovascular and metabolic health

3. Other Components

- **Lecithin:** Supports brain and liver function
- Oxalates and Phytates (antinutritional factors in small amounts – may affect mineral absorption if consumed in excess)

4. Practical Applications in a Healthy Diet: Incorporating sesame into a healthy diet is both simple and delicious, with a myriad of ways to enjoy its benefits.

- **As a Topping:** Toasted sesame seeds can be sprinkled over steamed vegetables, salads, or yogurt to add texture and a boost of minerals.
- **In Healthy Dips:** Tahini is the core ingredient for homemade hummus or as the base for creamy, dairy-free sauces for bowls and wraps.
- **In Baking:** Add whole sesame seeds to whole-grain bread dough, muffins, or granola bars to increase their fiber and protein content.
- **In Dressings:** Mix toasted sesame oil with rice vinegar, fresh ginger, and soy sauce for a flavorful, heart-healthy dressing.

5. Sesame Seeds vs Other Seeds: Nutritional Comparison

Sesame seeds are a nutritional powerhouse and stand out among other popular seeds such as flax, chia, and sunflower. This comparison highlights sesame seeds' exceptional calcium and lignan content, alongside other important nutrients.

Table 2 Sesame Seeds vs Other Seeds: Nutritional Comparison

Nutrient / Feature	Sesame Seeds	Flaxseeds	Chia Seeds	Sunflower Seeds
Calcium (mg/100g)	☑ 975	255	631	78
Lignans (mg/100g)	~800 ☑ (Sesamin, Sesamolin)	~380 (SDG)	Low	Low
Magnesium (mg/100g)	351	392	335	325
Iron (mg/100g)	14.6	5.7	7.7	5.3
Protein (g/100g)	17–18	18.3	16.5	21
Fiber (g/100g)	11.8	27.3	34.4	8.6
Omega-3 (ALA mg/100g)	Low	☑ 22,800	17,500	Low
Phytosterols (mg/100g)	400–450	300	100	270
Antioxidants	☑ High (Lignans, Vitamin E)	Moderate	Moderate	☑ Very High (Vitamin E)
Unique Bio-actives	☑ Sesamin, Sesamol	SDG	Polyphenols	Chlorogenic acid
Use in Skincare/ Pharma	☑ Widely used in cosmetics, anti-aging, UV-protection	Some research	Limited	☑ Vitamin E creams, antioxidants

Sesame seeds surpass other seeds in calcium and lignan content, making them especially beneficial for bone health and hormone regulation. Their antioxidant-rich profile and proven applications in skincare and pharmaceuticals further establish sesame seeds as a premium functional food and nutraceutical ingredient.

III. Traditional Medicine and Healing

Various cultures recognized and utilized sesame for its healing properties. These traditional uses have provided a rich foundation for modern scientific inquiry, with the following examples serving as a conceptual framework for the evidence presented earlier in the book.

- **Ayurveda:** In traditional Indian medicine, sesame oil is a highly revered substance (taila). The daily practice of Abhyanga involves massaging the body with warm sesame oil to nourish the skin, improve circulation, and calm the nervous system. Black sesame seeds are considered a potent food for building strength, promoting digestion, and supporting bone health, particularly for their warming and nourishing properties.
- **Traditional Chinese Medicine (TCM):** In TCM, black sesame seeds are seen as a powerful tonic for the liver and kidneys, which are believed to be the root of vitality and Jing (essential life force). They are commonly used to prevent premature hair greying and hair loss, and to moisturize the skin.

IV. Industrial, Agricultural, and Cultural Significance

Sesame's value extends far beyond food and medicine, playing significant roles in industry, agriculture, and cultural life.

- **Industrial and Cosmetic Uses: T**he oil's high content of fatty acids and antioxidants makes it a superb emollient for skincare, where it is used in lotions, soaps, and natural sunscreens. Its high stability due to the presence of lignans makes it resistant to oxidation, extending the shelf life of products. The distinctive aroma of toasted sesame is even used as a warm base note in some niche perfumes.
- **Agricultural and Environmental Benefits:** The sesame plant is a highly sustainable crop. Its deep taproot system makes it beneficial for crop rotation, helping to break pest cycles and improve soil health. The sesame oil cake, a high-protein byproduct remaining after oil extraction, is a valuable animal feed and an excellent organic fertilizer, supporting sustainable farming practices.
- **Cultural and Religious Significance:** In Hinduism, sesame seeds are considered a symbol of immortality and purity, deeply associated with Lord Vishnu. They play a crucial role in rituals and festivals, such as Makar Sankranti, where sweets made from sesame and jaggery are exchanged as a symbol of friendship and peace.

References

1. Bedigian, D., & Harlan, J. R. (1986). Evidence for sesame's African origin. Economic Botany, 40(3), 329-338.
2. Elleuch, M., et al. (2007). Chemical composition and antioxidant properties of sesame seeds. Journal of the American Oil Chemists' Society, 84(2), 173-181.
3. Zeng, H., et al. (2014). Health benefits of sesame seeds. Journal of Food and Drug Analysis, 22(1), 163-172.
4. Namiki, M. (1995). The chemistry and physiological functions of sesame. Food Reviews International, 11(2), 281-309.
5. Mahmoudi, R., et al. (2012). The effects of sesame on blood pressure and lipid profile in patients with type 2 diabetes. International Journal of Food Sciences and Nutrition, 63(4), 481-486.
6. Sankar, D., et al. (2006). Sesame oil regulates blood pressure and lipid profile in hypertensive diabetic patients. Clinical Nutrition, 25(3), 409-415.
7. Lee, M. H., et al. (2015). Antioxidant and anti-inflammatory activities of sesame oil in various in vitro systems. Journal of the American Oil Chemists' Society, 92(12), 1745-1752.
8. Chew, Y. L., et al. (2018). Sesame oil: An ancient cooking oil and a natural medicine. Molecules, 23(7), 1629.

IV. BEYOND THE SEED: A CULINARY ODYSSEY

1. Hummus (Middle Eastern)

- **Cultural Staple:** Hummus is a cornerstone of Middle Eastern cuisine, often served as part of a mezze platter. It represents hospitality and communal dining.
- **Historical Significance:** The origins of hummus are debated, but it has been a staple in the region for centuries. Its simple ingredients—chickpeas and sesame paste (tahini)—reflect the agricultural history of the Levant.
- **Nutritional Role:** Beyond its taste, hummus is a highly nutritious food, providing a rich source of plant-based protein, fiber, and healthy fats. It's a balanced, filling food that has been a dietary backbone for many.

2. Tahini (Middle East, Eastern Mediterranean)

- **Versatile Paste:** Tahini is a paste made from ground sesame seeds and is a cornerstone of Middle Eastern and Eastern Mediterranean cuisine. It's often used as a base for dips and sauces. The paste can be thinned with lemon juice and water to create a versatile sauce for meat, vegetables, and falafel.
- **Cultural Staple:** Tahini is a vital ingredient in many iconic dishes beyond hummus, such as baba ghanoush (a dip made from roasted eggplant) and halva (a dense, sweet confection). It's also eaten as a spread on bread, often sweetened with a drizzle of date or grape syrup.

3. Pasteli (Greek)

- **Ancient Tradition:** Pasteli is one of the oldest recorded confections, with a history that can be traced back to Ancient Greece. It was a popular source of quick energy and was even mentioned by the historian Herodotus.
- **Symbolic Value:** Historically, pasteli was offered at weddings and baptisms on the island of Rhodes, symbolizing fertility and a sweet life.
- **Simple Purity:** The dish's two main ingredients, honey and sesame, are a testament to the simplicity and richness of Mediterranean ingredients. It's an energy-dense snack that is both delicious and wholesome.

4. Halva (Middle East, Balkans, Central and South Asia)

- **Cultural and Historical Context:** Halva, a sweet confection, is an ancient dessert with regional variations across the Middle East, the Balkans, and Central and South Asia. It is often associated with celebrations and holidays.
- **Energy-rich Treat:** Made from tahini and sugar or honey, halva is a dense, nutrient-rich dessert that has long been valued as an energy-rich snack, especially for those in physically demanding jobs or for long journeys.

5. Tilkut (India)

- **Seasonal and Festive:** Tilkut is a traditional sweet from the Indian states of Bihar and Jharkhand. It is particularly popular during the winter months and is a staple of the festival of Makar Sankranti, where it is eaten as a symbol of warmth and prosperity.
- **Simple Ingredients:** The dish's primary ingredients, sesame seeds (til) and jaggery (unrefined cane sugar), highlight the use of local, seasonal produce and simple preparation methods that have been passed down through generations.

6. Sesame Noodles (East Asia)

- **Adaptable and Modern:** While dishes like black sesame soup have ancient roots, sesame noodles are a testament to the modern culinary use of sesame. The dish showcases the versatility of sesame paste and oil to create a flavorful sauce for a quick and satisfying meal.
- **Flavor Profile:** The importance of this dish lies in its balance of flavors—sweet, savory, nutty, and often spicy. The use of sesame paste, sesame oil, and other seasonings creates a complex sauce that has made it a popular dish in both East Asia and in Western interpretations of Asian cuisine.

7. Black Sesame Roll (Hong Kong, China)

- **Dim Sum Tradition:** This is a popular dim sum dessert, a chilled, sweet confection made from black sesame paste. Its importance lies in its role within the Cantonese tradition of dim sum, a meal of small, flavorful dishes typically enjoyed with tea.
- **Health and Beauty:** In Traditional Chinese Medicine,

black sesame is believed to be beneficial for hair and kidneys. The black sesame roll, therefore, is not just a dessert but is also consumed for its perceived health and beauty benefits.

8. Ka'ak (Near East)

- **Versatile Bread:** Ka'ak refers to a type of bread or cookie, often shaped into a large ring, that is covered in sesame seeds. It's a versatile food that can be savory or sweet and is found throughout the Near East.
- **Cultural Identity:** The distinctive ring shape and sesame coating make it an instantly recognizable food. It's a staple in many local bakeries and represents a shared culinary heritage across different countries in the region.

9. Benne Wafers (American South)

- **Historical Link:** These thin, crisp cookies are a specialty of Charleston, South Carolina. The importance of the "benne" wafer lies in its historical connection to West African culture, as "benne" is the Bantu word for sesame. Sesame seeds were brought to the Americas by enslaved people and became an integral part of Gullah Geechee cuisine.
- **Symbol of Good Luck:** For centuries, benne wafers have been considered a symbol of good luck and are often given as gifts. This cultural meaning adds a layer of significance beyond their delicious flavor.

10. Binangkal (Philippines)

- **A Snack of the Islands:** Binangkal are dense, deep-fried dough balls coated in sesame seeds. They are a popular snack in the Visayas and Mindanao regions of the Philippines, often enjoyed with hot chocolate or coffee. Their importance lies in their role as a comforting, everyday treat.
- **Simple Ingredients:** The simplicity of the ingredients—flour, sugar, and sesame seeds—reflects a common theme in many traditional snacks around the world that rely on a few staple ingredients to create something delicious.

11. Horchata de Ajonjolí (Puerto Rico)

- **Refreshing Drink:** This is a traditional Puerto Rican drink made from toasted sesame seeds, water, and spices like cinnamon and cloves. It's a flavorful and refreshing beverage that is particularly popular in local festivals and gatherings.
- **Culinary Fusion:** The use of sesame seeds in a drink is a unique example of how this ingredient has been incorporated into different culinary traditions, creating a distinct and beloved flavor profile that is a part of Puerto Rican identity.

12. Goma-ae (Japanese)

- **Culinary Balance:** Goma-ae is a perfect example of Japanese culinary philosophy, which emphasizes balance in flavor and nutrition. The dish uses a simple, nutty sesame dressing to elevate a plain vegetable, highlighting the ingredient's natural flavor.
- **Daily Diet:** Goma-ae is a common side dish in Japan, a part of everyday meals. Its use of toasted sesame seeds demonstrates a simple technique to add a layer of complexity and aroma to a dish without overpowering it.

13. Gomasio (Japan)

- **Savory Condiment:** Gomasio is a traditional Japanese dry condiment made from toasted sesame seeds and salt. It is used as a flavorful topping for rice, vegetables, and fish. The simple combination highlights the nutty flavor of the sesame seeds and adds a savory, salty crunch to any dish.
- **Nutritional Role:** Besides adding flavor, gomasio provides essential minerals and healthy fats. It is a staple in macrobiotic diets and is a testament to the Japanese philosophy of using simple, natural ingredients to create complex flavors.

14. Black Sesame Soup (China)

- **Nutritious Dessert:** A popular sweet soup from Chinese cuisine, black sesame soup is a rich, creamy, and nutty dessert. It is made by blending black sesame seeds with sugar and sometimes rice.
- **Health and Beauty:** In Traditional Chinese Medicine, black sesame is believed to have a variety of health benefits, including supporting kidney function, promoting healthy hair growth, and nourishing the skin. This dessert is not only delicious but is also consumed for its perceived wellness propertie

15. Biscotti Regina (Italy)

- **Regional Specialty:** These crunchy, sesame-seed-coated biscuits are a specialty of Palermo, Sicily, and are found throughout the region. The name “Queen’s cookies” reflects their simple elegance.
- **Simple Purity:** Made from basic ingredients like flour, sugar, and lard, the biscuits are rolled in toasted sesame seeds before being baked. The sesame adds a delicate nutty flavor and a satisfying crunch that elevates the simple cookie.

Sesameinfo.in

Global Knowledge hub

PUBLICATIONS


WORLD SESAME
& PEANUT
CONFERENCE
22-24 Oct 2026
DUBAI
MARK
YOUR
DATES
www.sesameconference.com