Nutrition

1-Microgreens: Functional Food for Nutrition and Dietary Diversification

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Abstract

Microgreens are tender, edible seedlings harvested 7-21 days after germination containing a central stem, cotyledons, and true leaves. Known as a fresh, ready-to-eat functional food, they are mostly rich in vitamins, antioxidants, bioactive compounds, and minerals, with distinctive flavors, colors, and textures. These attributes make microgreens a valuable component in nutrition and health research. In countries like India, where low-income households spend 50-80% of their income on food, micronutrient deficiencies are common, particularly among women. Indian women, facing a double burden of malnutrition, experience both underweight (18.7%) and obesity (24.0%) issues, with 57% suffering from anemia. Women's unique health requirements vary across life stages, from infancy to their elderly years, and they require diets rich in vitamins and minerals to ensure micronutrient adequacy. Microgreens, with their high nutrient density, hold promise in addressing these deficiencies. Fresh and processed microgreens based products can enhance food variety, nutritive value, and appeal. Rethinking agriculture and horticulture as tools to combat malnutrition and reduce the risk of non-communicable diseases (NCDs) is vital for achieving nutritional security and poverty reduction. This review compiles recent research on microgreens, focusing on their nutrient profiles, health benefits, suitable crops, substrates, seed density, growing methods, sensory characteristics, and applications as fresh and value-added products. It offers valuable insights into sustainable agriculture and the role of microgreens in enhancing human nutrition and health.

Keywords
Author Keywords
microgreensnutritional compositiongrowing conditionssensory attributes

Keywords Plus
ESCHERICHIA-COLI O157H7LIGHT-EMITTING DIODESHELF-LIFEPHYTOCHEMICAL COMPOSITIONMINERAL-CONTENTGROWING MEDIABABY LEAFNM LIGHTQUALITYBROCCOLI

Nutrition

2-Nutrition and Food Literacy: Framing the Challenges to Health Communication

Abstract

Nutrition and food literacy are two important concepts that are often used interchangeably, but they are not synonymous. Nutrition refers to the study of how food affects the body, while food literacy refers to the knowledge, skills, and attitudes necessary to make informed decisions about food and its impact on health. Despite the growing awareness of the importance of food literacy, food illiteracy remains a global issue, affecting people of all ages, backgrounds, and socioeconomic status. Food illiteracy has serious health implications as it contributes to health inequities, particularly among vulnerable populations. In addition, food literacy is a complex and multidisciplinary field, and there are numerous challenges to health communication that must be addressed to effectively promote food literacy and improve health outcomes. Addressing food illiteracy and the challenges to health communication is essential to promote health equity and improve health outcomes for all populations.

Keywords
Author Keywords
health communicationhealth policynutrition and dietnutritionistdisinformation
Keywords Plus
SOCIAL MARKETING CAMPAIGNPUBLIC-HEALTHPHYSICAL-ACTIVITYVEGETABLE INTAKETURKISH VERSIONCOOKING CLASSESINCREASE FRUITLIFE-STYLEINFORMATIONOBESITY

Nutrition

3-Applications of Artificial Intelligence, Machine Learning, and Deep Learning in Nutrition: A Systematic Review

By Armand, TPT (Armand, Tagne Poupi Theodore) [1] ; Nfor, KA (Nfor, Kintoh Allen) [2] ; Kim, JI (Kim, Jung-In) [1] ; Kim, HC (Kim, Hee-Cheol) [1] , [2] , [3] (provided by Clarivate)

Abstract

In industry 4.0, where the automation and digitalization of entities and processes are fundamental, artificial intelligence (AI) is increasingly becoming a pivotal tool offering innovative solutions in various domains. In this context, nutrition, a critical aspect of public health, is no exception to the fields influenced by the integration of AI technology. This study aims to comprehensively investigate the current landscape of AI in nutrition, providing a deep understanding of the potential of AI, machine learning (ML), and deep learning (DL) in nutrition sciences and highlighting eventual challenges and futuristic directions. A hybrid approach from the systematic literature review (SLR) guidelines and the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines was adopted to systematically analyze the scientific literature from a search of major databases on artificial intelligence in nutrition sciences. A rigorous study selection was conducted using the most appropriate eligibility criteria, followed by a methodological quality assessment ensuring the robustness of the included studies. This review identifies several AI applications in nutrition, spanning smart and personalized nutrition, dietary assessment, food recognition and tracking, predictive modeling for disease prevention, and disease diagnosis and monitoring. The selected studies demonstrated the versatility of machine learning and deep learning techniques in handling complex relationships within nutritional datasets. This study provides a comprehensive overview of the current state of AI applications in nutrition sciences and identifies challenges and opportunities. With the rapid advancement in AI, its integration into nutrition holds significant promise to enhance individual nutritional outcomes and optimize dietary recommendations. Researchers, policymakers, and healthcare professionals can utilize this research to design future projects and support evidence-based decision-making in AI for nutrition and dietary guidance.

Keywords
Author Keywords
artificial intelligencemachine learningdeep learningnutritiondiet

Keywords Plus
DIETARYOBESITY

4-Role of calcium nutrition in plant Physiology: Advances in research and insights into acidic soil conditions - A comprehensive review

By Jing, T (Jing, Tao) [1] ; Li, JY (Li, Jingyang) [2] ; He, YD (He, Yingdui) [1] ; Shankar, A (Shankar, Alka) [3] ; Saxena, A (Saxena, Abhishek) [4] ; Tiwari, A (Tiwari, Archana) [4] ; Maturi, KC (Maturi, Krishna Chaitanya) [5] , [6] ; Solanki, MK (Solanki, Manoj Kumar) [7] ; Singh, V (Singh, Vijai) [2] ; Eissa, MA (Eissa, Mamdouh A.) [1] , [8] ; (provided by Clarivate) Source PLANT PHYSIOLOGY AND BIOCHEMISTRY Volume 210 DOI 10.1016/j.plaphy.2024.108602 Article Number 108602 Published MAY 2024 Early Access APR 2024 Indexed 2024-06-06 Document Type Article

Abstract

Plant mineral nutrition has immense significance for crop productivity and human well-being. Soil acidity plays a major role in determining the nutrient availability that influences plant growth. The importance of calcium (Ca) in biological processes, such as signaling, metabolism, and cell growth, underlines its critical role in plant growth and development. This review focuses on soil acidification, a gradual process resulting from cation leaching, fertilizer utilization, and drainage issues. Soil acidification significantly hampers global crop production by modifying nutrient accessibility. In acidic soils, essential nutrients, such as nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), and Ca become less accessible, establishing a correlation between soil pH and plant nutrition. Cutting-edge Ca nutrition technologies, including nanotechnology, genetic engineering, and genome sequencing, offer the potential to deliver Ca and reduce the reliance on conventional soluble fertilizers. These fertilizers not only contribute to environmental contamination but also impose economic burdens on farmers. Nanotechnology can enhance nutrient uptake, and Ca nanoparticles improve nutrient absorption and release. Genetic engineering enables the cultivation of acid-tolerant crop varieties by manipulating Ca-related genes. High-throughput technologies such as next-generation sequencing and microarrays aid in identifying the microbial structures, functions, and biosynthetic pathways involved in managing plant nutritional stress. The ultimate goal is to shed light on the importance of Ca, problems associated with soil acidity, and potential of emerging technologies to enhance crop production while minimizing the environmental impact and economic burden on farmers.

Keywords
Author Keywords

Soil acidityNutrient availabilityCalcium ionsBiological processesNanotechnologyGenetic engineeringGenome sequencing

Keywords Plus

AMMONIUM-NITRATEFUSARIUM-WILTFERTILITYCARBONATENUTRIENTIMPACTLIMEHOMEOSTASISEMISSIONSRESPONSES

Nutrition

5-Global Food Security and Sustainability Issues: The Road to 2030 from Nutrition and Sustainable Healthy Diets to Food Systems Change

Abstract

The accomplishment of food/nutrition security for all across sustainable food systems (SFS) is tied to the Sustainable Development Goals (SDGs). SFS is connected to all SDGs via the traditional framework of social inclusion, economic development, environmental safety, inclusivity, and the development of sustainable food systems. We suggest that, for the world to achieve sustainable development, a shift to SFS is necessary to guarantee food/nutrition security for all, while operating within planetary boundaries to protect ecosystems and adapt to and mitigate climate change. Therefore, there is a requirement for original approaches that implement systemic and more participatory methods to engage with a wider range of food system stakeholders. However, the lack of skills and tools regarding novel methodologies for food system transformation is a key obstacle to the deployment of such approaches in practice. In the first part of this review, a summary of some challenges that occur in the governance of food system transformation is given. Through a case study of plant-based proteins and their biological and chemical modification as diets shift towards alternative proteins, we demonstrate that resource-efficient food systems and food waste, through system transformation, are useful in understanding both (i) how food system transformation has ensued and (ii) how the required transformation is prohibited. Finally, we discuss the implications of food system transformation in terms of nutrition and sustainable healthy diets, which are needed to achieve changes in food safety systems in the future. The linkage of food and the environment is evident, focusing on nutrition and sustainable healthy diets. This cannot be accomplished without system change and research towards new foods and, more specifically, new proteins such as plant-based ones and their biological and chemical modification.

Nutrition

6-From posts to practice: Instagram's role in veterinary dairy cow nutrition education-How does the audience interact and apply knowledge? A survey study

By Lamanna, M (Lamanna, M.) [1] ; Muca, E (Muca, E.) [2] ; Buonaiuto, G (Buonaiuto, G.) [1] ; Formigoni, A (Formigoni, A.) [1] ; Cavallini, D (Cavallini, D.) [1] (provided by Clarivate) Source

Abstract

This study evaluates Instagram's efficacy as an educational tool in veterinary sciences, focusing on dairy cow nutrition and management. Using the Instagram account "Stalla Didattica Unibo," established in December 2020, a survey was conducted with 102 respondents, primarily consisting of university students (44.12%). The respondents were divided into 2 major groups: students and the general population, with the latter comprising professionals and others not currently in educational programs. In the overall population, the age group of 25 to 34 yr accounted for 51%, but among students, it was 73.3%. In terms of gender distribution, there was a female majority in the general population (59.8%) and a male majority among students (73.3%). Most responders were from Italy, with Emilia-Romagna contributing significantly. Engagement was measured not only by the length of time participants followed the account but also by active interactions such as likes, comments, and shares. Among the total population, 47.1% had followed the page for over a year, compared with 37.8% of students. Importantly, engagement metrics showed active participation, with a majority reporting improved knowledge (75.6% of the total population and 74.5% of students) and practical application of content (64.4% of the total population and 67.6% of students). Content preferences varied, with the general population favoring quizzes (33.3%) and stories (17.8%), whereas students showed a stronger preference for standard posts (36.3%). Impact was defined as the perceived influence of the Instagram content on the respondents' learning and professional practices, with 46.7% of the total population and 52.9% of students agreeing or strongly agreeing that the page had a positive impact on their knowledge and practical skills. Furthermore, 84.3% of students and 77.8% of the total population stated they would recommend the page to others, underscoring the account's effectiveness as a digital educational tool. The study highlights Instagram's potential to enhance veterinary education and suggests further research to explore the broader application of these strategies across different educational contexts and platforms.

Keywords
Author Keywords
Instagramveterinary educationsocial media learningdigital education tools

Keywords Plus
SOCIAL MEDIAHEALTH

Nutrition

7-The relationship between body roundness index and depression: A cross-sectional study using data from the National Health and Nutrition Examination Survey (NHANES) 2011-2018

By Zhang, L (Zhang, Lu) [1] ; Yin, JH (Yin, Jiahui) [2] ; Sun, HY (Sun, Haiyang) [3] ; Dong, WL (Dong, Wenliang) [4] ; Liu, ZH (Liu, Zihui) [4] ; Yang, JG (Yang, Jiguo) [5] ; Liu, YX (Liu, Yuanxiang) [3] (provided by Clarivate) Source JOURNAL OF AFFECTIVE DISORDERS Volume 361 Page 17-23 DOI 10.1016/j.jad.2024.05.153 Published SEP 15 2024 Early Access JUN 2024 Indexed 2024-06-29 Document Type Article

Abstract

Background: Depression is linked to obesity. The body roundness index (BRI) provides a more accurate assessment of body and visceral fat levels than the body mass index or waist circumference. However, the association between BRI and depression is unclear. Therefore, we investigated this relationship using the National Health and Nutrition Examination Survey (NHANES) database. Methods: In this population-based cross-sectional study, data from 18,654 adults aged >= 20 years from the NHANES 2011-2018 were analyzed. Covariates, including age, gender, race/ethnicity, education level, marital status, poverty-income ratio, alcohol status, smoking status, hypertension, diabetes mellitus, cardiovascular disease, energy intake, physical activity, total cholesterol, and triglycerides were adjusted in multivariable logistic regression models. In addition, smooth curve fitting, subgroup analysis, and interaction testing were conducted. Results: After adjusting for covariates, BRI was positively correlated with depression. For each one-unit increase in BRI, the prevalence of depression increased by 8 % (odds ratio = 1.08, 95 % confidence interval = 1.05-1.10, P < 0.001). Limitations: As this was a cross-sectional study, we could not determine a causal relationship between BRI and depression. Patients with depression in this study were not clinically diagnosed with major depressive disorder. Conclusion: BRI levels were positively related to an increased prevalence of depression in American adults. BRI may serve as a simple anthropometric index to predict depression.

Keywords
Author Keywords
NHANESBody roundness indexDepressionCross-sectional studyAdult

Keywords Plus
QUESTIONNAIRE-9 PHQ-9OXIDATIVE STRESSOBESITYINFLAMMATIONOVERWEIGHT

Nutrition

8-Global, regional, and national progress towards the 2030 global nutrition targets and forecasts to 2050: a systematic analysis for the Global Burden of Disease Study 2021

By Arndt, MB (Arndt, Michael Benjamin) ; Abate, YH (Abate, Yohannes Habtegiorgis) ; Abbasi-Kangevari, M (Abbasi-Kangevari, Mohsen) ; ElHafeez, SA (ElHafeez, Samar Abd) ; Abdelmasseh, M (Abdelmasseh, Michael) ; Abd-Elsalam, S (Abd-Elsalam, Sherief) ; Abdulah, DM (Abdulah, Deldar Morad) ; Abdulkader, RS (Abdulkader, Rizwan Suliankatchi) ; Abidi, H (Abidi, Hassan) ; Abiodun, O (Abiodun, Olumide) ; Group Author Global Nutr Target Collaborators (Global Nutr Target Collaborators) (provided by Clarivate) Source LANCET Volume 404 Issue 10471 Page 2543-2583 DOI 10.1016/S0140-6736(24)01821-X Published DEC 21 2024 Early Access DEC 2024 Indexed 2025-02-09 Document Type Article

Abstract

Background The six global nutrition targets (GNTs) related to low birthweight, exclusive breastfeeding, child growth (ie, wasting, stunting, and overweight), and anaemia among females of reproductive age were chosen by the World Health Assembly in 2012 as key indicators of maternal and child health, but there has yet to be a comprehensive report on progress for the period 2012 to 2021. We aimed to evaluate levels, trends, and observed-to-expected progress in prevalence and attributable burden from 2012 to 2021, with prevalence projections to 2050, in 204 countries and territories.

Methods The prevalence and attributable burden of each target indicator were estimated by age group, sex, and year in 204 countries and territories from 2012 to 2021 in the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021, the most comprehensive assessment of causes of death, disability, and risk factors to date. Country-specific relative performance to date was evaluated with a Bayesian meta-regression model that compares prevalence to expected values based on Socio-demographic Index (SDI), a composite indicator of societal development status. Target progress was forecasted from 2021 up to 2050 by modelling past trends with meta-regression using a combination of key quantities and then extrapolating future projections of those quantities.

Findings In 2021, a few countries had already met some of the GNTs: five for exclusive breastfeeding, four for stunting, 96 for child wasting, and three for child overweight, and none met the target for low birthweight or anaemia in females of reproductive age. Since 2012, the annualised rates of change (ARC) in the prevalence of child overweight increased in 201 countries and territories and ARC in the prevalence of anaemia in females of reproductive age decreased considerably in 26 countries. Between 2012 and 2021, SDI was strongly associated with indicator prevalence, apart from exclusive breastfeeding (vertical bar r-vertical bar=0.46-0.86). Many countries in sub-Saharan Africa had a decrease in the prevalence of multiple indicators that was more rapid than expected on the basis of SDI (the differences between observed and expected ARCs for child stunting and wasting were -0.5% and -1.3%, respectively). The ARC in the attributable burden of low birthweight, child stunting, and child wasting decreased faster than the ARC of the prevalence for each in most low-income and middle-income countries. In 2030, we project that 94 countries will meet one of the six targets, 21 countries will meet two targets, and 89 countries will not meet any targets. We project that seven countries will meet the target for exclusive breastfeeding, 28 for

child stunting, and 101 for child wasting, and no countries will meet the targets for low birthweight, child overweight, and anaemia. In 2050, we project that seven additional countries will meet the target for exclusive breastfeeding, five for low birthweight, 96 for child stunting, nine for child wasting, and one for child overweight, and no countries are projected to meet the anaemia target.

Interpretation Based on current levels and past trends, few GNTs will be met by 2030. Major reductions in attributable burden for exclusive breastfeeding and anthropometric indicators should be recognised as huge scientific and policy successes, but the comparative lack of progress in reducing the prevalence of each, along with stagnant anaemia in women of reproductive age and widespread increases in child overweight, suggests a tenuous status quo. Continued investment in preventive and treatment efforts for acute childhood illness is crucial to prevent backsliding. Parallel development of effective treatments, along with commitment to multisectoral, long-term policies to address the determinants and causes of suboptimal nutrition, are sorely needed to gain ground. Copyright (c) 2024 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

Keywords

Keywords Plus

MIDDLE-INCOME COUNTRIESBREAST-FEEDING PRACTICESBIRTH-WEIGHT INFANTSFOR-GESTATIONAL-AGECHILDHOOD OBESITYSTUNTING REDUCTIONREPRODUCTIVE AGERISKOVERWEIGHTANEMIA