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The 5th International Online Conference on Nutrients

10–12 December 2025 | Online



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on Nutrients

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The 5th International Online Conference
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Table of Contents

Welcome from the Chairs.....	1
Session Chairs	3
Keynote Speakers.....	4
Invited Speakers	6
Program Overview	8
IOC Nu 2025 Program	9
Session 1. Personalised Nutrition for Athletic Performance	9
Session 2. Innovations in Sports Supplements.....	24
Session 3. Gender-Specific Strategies in Sports Nutrition	33
Session 4. Nutrition for Recovery and Injury Prevention	39
Session 5. Sustainable Diets in Sport: Balancing Performance and Health.....	47
Session 6. Microbiota and Sports Nutrition: The gut-Performance Connection	65

Welcome from the Chairs

Dear Colleagues,

Welcome to this virtual online conference, dedicated to the dynamic and ever-evolving field of sports nutrition. This event aims to provide a comprehensive platform for the discussion of cutting-edge research and innovative strategies that connect nutrition and athletic performance. With an emphasis on both science and practice, the conference highlights how tailored nutritional approaches can optimize performance, recovery, and overall health across diverse athletic disciplines.

This year, we explore critical intersections between sports nutrition and personalized strategies, focusing on the unique physiological and metabolic demands of athletes. Topics will range from macronutrient periodization and hydration strategies to the latest advancements in sports supplementation and the role of nutrition in injury prevention and rehabilitation. Moreover, the conference will address the importance of gender-specific considerations, sustainable dietary choices, and their implications for both elite athletes and active individuals.

The sessions for this conference include the following:

- S1. Personalized Nutrition for Athletic Performance;
- S2. Innovations in Sports Supplements;
- S3. Gender-Specific Strategies in Sports Nutrition;
- S4. Nutrition for Recovery and Injury Prevention;
- S5. Sustainable Diets in Sports: Balancing Performance and Planetary Health;
- S6. Microbiota and sports nutrition: The gut-performance connection.

We extend our warmest welcome to you, esteemed scholars, practitioners, and experts, as we come together to discuss and share insights into how nutrition can support athletes in achieving their goals. Together, we will explore innovative perspectives that not only enhance athletic performance but also contribute to the broader goals of health and sustainability in the world of sports.

Best wishes,



Professor Elvira Padua
Department of Human
Science and Promotion of
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Open University of Rome,
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Prof. Dr. David C. Nieman
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Session Chairs



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Department of Biochemistry and Physiology, Faculty of Pharmacy and Food Sciences, University of Barcelona, Barcelona, Spain; Nutrition and Food Safety Research Institute (INSA), Santa Coloma de Gramenet, Spain



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Professor Ahmed El-Sohemy

Department of Nutritional Sciences, University of Toronto, Toronto, Canada



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Prof. Dr. Maria Grazia Tarsitano

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Keynote Speakers



Dr. Francisco J. Pérez-Cano

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Invited Speakers



Dr. Deborah Agostini

Department of Biomolecular Sciences, University of Urbino Carlo Bo, Urbino, Italy



Dr. Olga Scudiero

Department of Molecular Medicine and Medical Biotechnologies, Federico II University, Napoli, Italy



Dr. Roberto Cannataro

Research Division, Dynamical Business & Science Society–DBSS International SAS, Bogotá, Colombia, Galascreen Laboratories, Department of Pharmacy, Health, and Nutritional Sciences, University of Calabria, Rende, Italy



Professor Guglielmo Duranti

Department of Movement, Human and Health Sciences, University of Rome FORO ITALICO, Rome, Italy



Prof. Dr. Alessandra Feraco

Department for the Promotion of Human Science and Quality of Life, San Raffaele Open University, Rome, Italy



Prof. Dr. Andrea Armani

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Rome, Italy

Program Overview

	10 December 2025	11 December 2025	12 December 2025
Morning	Session 3. Gender-Specific Strategies in Sports Nutrition Flash Poster Session	Session 5. Sustainable Diets in Sport: Balancing Performance and Health	Session 4. Nutrition for Recovery and Injury Prevention
Afternoon	Session 1. Personalized Nutrition for Athletic Performance	Session 2. Innovations in Sports Supplements	Session 6. Microbiota and Sports Nutrition: The Gut-Performance Connection

IOCNu 2025 Program

10 December 2025 (Wednesday)

Session 3 – Gender-Specific Strategies in Sports Nutrition and Flash Poster Session

Time: 09:00 (CET, Basel) | 03:00 (EST, New York) | 16:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
9:00-9:10	Prof. Dr. Mauro Lombardo Prof. Dr. David Nieman Conference Chairs	Welcome from the Event Chairs
9:10-9:20	Dr. Sabrina Donati Zeppa Session Chair	Welcome from the Session Chair
9:20-9:50	Prof. Antonio Paoli Keynote Speaker	Time Restricted Eating for Health and Performance
9:50-10:10	Dr. Deborah Agostini Invited Speaker	Gender-Specific Nutrigenomics: How Genes Modulate Supplement Response
10:10-10:30	Dr. Olga Scudiero Invited Speaker	Nutrition and micronutrients: focus on elite basketball player
10:30-10:45	Rossella Rotondo Selected Speaker	Homocysteine, Gender, and Physical Activity: The Role of B-Vitamin and Folate Supplementation – A Systematic Review
10:45-11:00	Leehen Mashlah Selected Speaker	Sex-based differences in in-vitro protein digestibility and bioactive peptide release from bovine milk and oat drink: Implications for gender-specific sports nutrition
11:00-11:15	Alessia Bartolacci Selected Speaker	Vitamin D Supplementation and Follow-Up: Comprehensive Monitoring of Blood Markers and Performance in Runners and Non-Runners During Autumn and Winter
<i>Flash Poster Session</i>		
11:15-11:20	Lydia Bemah Poster Presenter	Optimising Performance Through Gender-Specific Sports Nutrition: A Systematic Review
11:20-11:25	Mónica Castillo Martínez Poster Presenter	Characterisation of the gut microbiota in elite female futsal players throughout the season
11:25-11:30	Alexandra Botnaru Poster Presenter	Plant Protein Powders: Plant Protein Powders: Nutritional Quality, Performance Outcomes and Current Challenges
11:30-11:35	Paula Barciela Poster Presenter	Nutrigenomic Modeling of Performance Phenotypes in Sport: An Evidence-Based Systematic Review
11:35-11:40	Joanna Kowalkowska Poster Presenter	Association between severity of anxiety and dietary patterns among university students
11:40-11:45	Matias Rodríguez Elhordoy Poster Presenter	Nutritional characterization of Lupinus angustifolius flour and protein isolate as sustainable plant-based ingredients for sports supplements
11:45-11:50	David Romero García Poster Presenter	Food and beverage intake habits in handball: relationship with gender and competitive level
11:50-11:55	Natalija Atanasova-Pancevska Poster Presenter	Optimizing Gut Microbiota for Enhanced Performance in Judoka: The Role of Nutrition and Training Strategies
11:55-12:00	Jose Herrero Barceló Poster Presenter	Do you know body composition and dietary habits of combat sports athletes? A systematic review.
12:00-12:05	Shulin Lee Poster Presenter	Effects of Cordyceps militaris Supplementation on Oxidative Stress and Muscle Damage Following Endurance Exercise

Session 1 – Personalized Nutrition for Athletic Performance**Time: 14:00 (CET, Basel) | 08:00 (EST, New York) | 21:00 (CST Asia, Beijing)**

Time in CET	Speaker	Title
14:00-14:10	Prof. Dr. Ahmed El-Sohehy Session Chair	Welcome from the Session Chair
14:10-14:40	Prof. Dr. Ahmed El-Sohehy Keynote Speaker	Variations in nutrition-related genes and athletic performance
14:40-15:10	Prof. Dr. Mikel Zabala Keynote Speaker	How professional cycling teams work regarding nutrition and its personalization
15:10-15:40	Dr. Ildus Akhmetov Keynote Speaker	The Role of Genetics and Lifestyle in Skeletal Muscle Hypertrophy
15:40-15:55	Melvin Bernardino Selected Speaker	Nutrition Knowledge, Dietary Habits, and Dietary Intake of Collegiate Athletes Living in Selected Rural and Urban Area in the Philippines
15:55-16:10	Toshika Chetan Bahekar Selected Speaker	Adaptogenic Strategies in Sports Nutrition: A Review
16:10-16:25	Rupali Panse Selected Speaker	The role of Ayurvedic Dosha Typing in Personalized Nutrition and Athletic Recovery: A Literature-Based Evidence Review"
16:25-16:40	Konstantinos Papaioannou Selected Speaker	The Role of Nutrient and Activity Timing in Healthy Aging: A Conceptual Perspective
16:40-16:55	Neval Burkay Selected Speaker	Genetic Profiling of Inflammation, Connective Tissue, and One-Carbon Metabolism Genes in Athletes: A Hypothesis-Based Perspective on Personalized Nutrition

11 December 2025 (Thursday)**Session 5 – Sustainable Diets in Sport: Balancing Performance and Health****Time: 09:00 (CET, Basel) | 03:00 (EST, New York) | 16:00 (CST Asia, Beijing)**

Time in CET	Speaker	Title
9:00-9:10	Professor Marika Massaro Session Chair	Welcome from the Session Chair
9:10-9:40	Prof. Dr. Giuseppe Santarpino Keynote Speaker	Enhanced Recovery after cardiac surgery (ERAS) and Developments in Perioperative Care: Nutritional and Exercise Advice
9:40-10:00	Prof. Guglielmo Duranti Invited Speaker	The role of polyphenols in regulating skeletal muscle development and homeostasis: Molecular mechanisms and potential medical applications
10:00-10:15	Jiyan Aslan Ceylan Selected Speaker	The Digital Diet Literacy Paradox: Why Highly Educated, Active Adults Still Fall Behind
10:15-10:30	Mustafa Fevzi Karagöz Selected Speaker	The Impact of Caffeine-Related Genetic Variants on Power and Endurance Performance in Athletes: A Personalized Nutrigenetic Approach
10:30-10:45	Elsa Blanco-Ferran Selected Speaker	Effects of a Maternal Diet Rich in Fiber and Polyphenols on the Lipid Metabolism of Mothers and Their Offspring Early and Later in Life.
10:45-11:00	Vasiliki Zisiopoulou Selected Speaker	Nutrition, Physical Activity, and Quality of Life among Children and Adolescents with Type 1 Diabetes
11:00-11:15	Aleena Parvez Selected Speaker	Sustainable Dietary Strategies for Enhancing Athletic Performance and Reducing Environmental Impact

11:15-11:30	Lamia Seddiki Selected Speaker	The Ergogenic Potential of Date-Palm Syrup in Athletic Performance
11:30-11:50	Assoc. Prof. Antonello Lorenzini Invited Speaker	Nutritional-evidence synthesis and personalized tools for a healthy diet

Session 2 – Innovations in Sports Supplements

Time: 15:00 (CET, Basel) | 09:00 (EST, New York) | 22:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
15:00-15:10	Prof. Caterina Conte Session Chair	Welcome from the Session Chair
15:10-15:40	Dr. Sandrina Heleno Keynote Speaker	From Nature to Performance: New Perspectives on the Creation of Natural Isotonic Supplements for Sports
15:40-16:10	Prof. Dr. Richard Kreider Keynote Speaker	Innovative Applications of Creatine Supplementation throughout the Lifespan
16:10-16:30	Dr. Roberto Cannataro Invited Speaker	Inflammation and exercise, a need to be managed: focus on omega3
16:30-16:45	Richa Pande Selected Speaker	From Label to Scoop: Profiling Ingredient and Nutrient Labelling Patterns in Commercially Available Protein Supplements
16:45-17:00	Pedro Estevan Navarro Selected Speaker	Nitrate and Beetroot Juice Claims on Sports Supplement Labeling. Analytical Assessment According to Scientific Evidence and Criteria
17:00-17:15	Álvaro López-Samanes Selected Speaker	Effects of Beta-Alanine Supplementation on Neuromuscular and Cardiovascular Performance in Female Rugby Players
17:15-17:30	Diego Fernández Lázaro Selected Speaker	Impact of p-Syneprine Supplementation on Biomarkers of Health and Performance in Physically Active Healthy Adults: A Systematic Review of Clinical Trials
17:30-17:45	Ezgi Nur Yuksek Selected Speaker	The Mineral Content of Camellia japonica Leaves and Their Potential as a Functional Food in Sports Nutrition
17:45-18:00	Dr. Shweta Keswani Selected Speaker	A Comprehensive Literature Review on Innovations in Sports Supplementation: Trends, Technologies, and Future Perspectives

12 December 2025 (Friday)

Session 4 – Nutrition for Recovery and Injury Prevention

Time: 09:00 (CET, Basel) | 03:00 (EST, New York) | 16:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
9:00-9:10	Prof. Dr. Maria Grazia Tarsitano Session Chair	Welcome from the Session Chair
9:10-9:30	Prof. Dr. Maria Grazia Tarsitano Invited Speaker	Nutrition for recovery and injury prevention: state of art
9:30-10:00	Prof. Dr. Paola Palestini Keynote Speaker	Antioxidant and anti-inflammatory effect of different phytochemicals in in vitro models of bowel disease
10:00-10:20	Prof. Dr. Alessandra Feraco Invited Speaker	From Physiology to Practice: Gender Differences in Training Adaptations and Nutritional Strategies for Peak Performance
10:20-10:40	Prof. Dr. Andrea Armani Invited Speaker	Nutritional Strategies for Exercise-Induced Muscle Damage: Evidence from Preclinical Models

10:40-10:55	Prof. Guglielmo Durante Selected Speaker	Moringa oleifera leaf extract mitigates dexamethasone-induced muscle atrophy in C2C12 myotubes
10:55-11:10	Milana Vuković Selected Speaker	Are All Alpha-Lipoic Acid Dietary Supplements Equal in Quality and Performance?
11:10-11:25	Yongting Luo Selected Speaker	Lactoferrin combined with Coenzyme Q10 ameliorate sarcopenia in an aging mouse model induced by D-galactose
11:25-11:40	Gülşen Meral Selected Speaker	Management of Inflammation and Tendinitis Risk in Athletes with Omega-3: A Nutrigenetic-Based Personalized Approach

Session 6 - Microbiota and Sports Nutrition: The Gut-Performance Connection

Time: 15:00 (CET, Basel) | 09:00 (EST, New York) | 22:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
15:00-15:10	Dr. Francisco J. Pérez-Cano Session Chair	Welcome from the Session Chair
15:10-15:40	Dr. Francisco J. Pérez-Cano Keynote Speaker	Probiotics and immunity during exercise
15:40-16:10	Prof. Dr. David Nieman Keynote Speaker	Linkage Between the Gut Microbiome Composition and Post-Exercise Inflammation.
16:10-16:40	Prof. Margarida Castell Keynote Speaker	Exercise and Immunity
16:40-16:55	Zaleiha Shafiei Selected Speaker	Antibacterial and Antibiofilm Potentials of LAB-Derived Metabolites Against Porphyromonas gingivalis
16:55-17:10	Dingkang Wang Selected Speaker	Fatty acid-primed S. boulardii enhances obesity treatment by improving gut survival and microbiota
17:10-17:20	Prof. Dr. Mauro Lombardo, Prof. Dr. David Nieman and Prof. Dr. Elvira Padua Event Chairs	Closing Remarks

Session 1. Personalised Nutrition for Athletic Performance

sciforum-144049: ¿Do you know body composition and dietary habits of combat sports athletes?. A systematic review

Jose Herrero Barceló ^{1,*}, José Miguel Martínez Sanz ^{1,2} and Mónica Castillo Martínez ^{1,2}

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² Research Group on Applied Dietetics, Nutrition and Body Composition (DANUC). University of Alicante. San Vicente del Raspeig (Alicante), 03690, Spain

Introduction

Combat sports involve successive high-intensity, short-duration bouts (rounds) interspersed with brief rest periods, which gives them an intermittent nature. Athletes' body composition and dietary intake are closely linked to physiological demands and are key determinants of athletic performance. The aim of this study is to review the scientific literature on body composition, dietary intake, and eating habits of male and female combat sport athletes.

Methods

A search was conducted in the PubMed-MEDLINE, Web of Science, and Scopus databases, identifying 320 documents. The research focused on amateur, semi-professional, and professional athletes in boxing, karate, kickboxing, jiu-jitsu, taekwondo, judo, muay thai, and mixed martial arts (MMA). After screening and data extraction, 17 studies met the inclusion criteria and were included in the review.

Results

A total of 500 athletes (390 males and 110 females) were assessed across all studies. Most athletes, both male and female, had BMI values within the normal range, with low or normal body fat percentages and adequate muscle mass, during both reference periods (BMI M: 24.45 ± 3.61 , F: 22.49 ± 2.45 ; %Fat M: 12.59 ± 6.16 , F: 23.42 ± 4.60 ; Lean mass (kg) M: 62.45 ± 6.83 , F: 43.28 ± 4.79) and pre-competitive periods (BMI M: 21.56 ± 1.94 , F: 19.40 ± 2.20 ; %Fat M: 9.03 ± 4.09 , F: 13.91 ± 3.85 ; Lean mass (kg) M: 62.65 ± 8.72 , F: 47.14 ± 5.35). Regarding dietary intake, most athletes reported energy (32.8 ± 14.4 kcal/kg/day) and carbohydrate (4.1 ± 2.2 g/kg/day) intakes below official recommendations. During pre-competition periods, energy and nutrient intake decreased as a strategy to achieve rapid weight loss, primarily through the loss of lean mass.

Conclusions

Despite maintaining adequate body composition, combat sport athletes tend to follow inadequate dietary patterns, especially during pre-competitive periods, which may negatively affect athletic performance.



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sciforum-144102: Genetic Profiling of Inflammation, Connective Tissue, and One-Carbon Metabolism Genes in Athletes: A Hypothesis-Based Perspective on Personalized Nutrition

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Introduction

Chronic inflammation, connective tissue injuries, and tendinopathies are critical biological factors that can compromise performance sustainability in athletes. Nutrigenetic research has shown that genetic variants related to inflammatory response (IL6, TNF), connective tissue integrity (COL5A1, GDF5), and one-carbon metabolism (MTHFR, MTRR) significantly contribute to these risks. Impairments in one-carbon metabolism may alter methylation efficiency, thereby influencing recovery processes and musculoskeletal health.

Methods

An anonymized genetic dataset obtained from an athlete's inflammation, connective tissue, and one-carbon metabolism panels through an Epigenetic Coaching service was analyzed. Identified genotypes were compared with performance- and health-related polymorphisms reported in the literature to construct an individualized biological risk profile.

Results

The panel revealed IL6 (GG) and TNF (AA) genotypes associated with prolonged exercise-induced inflammation. COL5A1 (TT) and GDF5 (CC) variants were linked to reduced connective tissue resilience and an increased risk of tendon injury. MTHFR (TT) and MTRR (AG) genotypes suggested decreased folate metabolism efficiency and reduced methylation capacity.

Conclusion

The findings support the hypothesis that optimizing one-carbon metabolism through nutrients such as active folate (5-MTHF), vitamins B6 and B12, and choline could potentially enhance methylation efficiency and modulate inflammation. However, this interpretation remains hypothesis-based and requires validation in future studies. Personalized supplementation guided by genetic profiling may represent a promising yet exploratory approach to improving recovery, reducing injury risk, and supporting overall athletic performance.



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sciforum-149504: Development and evaluation of plant based 3D printed oral dispersible films for personalized nutrition for athletes

Jadala Shankaraswamy

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In athletes perspiration depletes reserves of minerals and electrolytes as well as oxidative stress increase with effort and is accompanied by muscle fatigue, cellular damage, and impaired immunity. Athletes often use artificial supplements in order to correct mineral deficiency and also pose risks related to bioavailability and potential toxicity. However, emphasize the sports nutrition is not a one size fits all solution, as each athlete has specific nutritional needs. Hence, nutritional customization with 3D food printing can allow the creation of tailored food for individual athletes. In present investigation fabrication of oral disintegrating films (ODFs) were developed through extrusion-based 3D printing using extracts of *Alternanthera sessilis*, *Sauropus androgynous* popularly known as *multivitamin* plant leaves and fruit vegetable of *Momordica dioica* extracts combined with HPMC K4M/E5, pullulan, moringa gum, ghatti gum, glycerol, roselle calyx powder, and fructo-oligosaccharide. The fabricated ODF films displayed consistent thickness (0.228 ± 0.008 mm to 0.340 ± 0.012 mm), rapid disintegration (15.23 ± 0.53 to 36.545 ± 0.65 s), and strong organoleptic scores (92.4 ± 1.60 to $91.2 \pm 4.18/100$). Moisture content (7.50 ± 0.13 to $6.154 \pm 0.21\%$) and swelling index (26.68 ± 0.92 to $40.40 \pm 2.80\%$) supported stability and mucosal compatibility. SEM images of all formulations revealed a uniform matrix with irregular depressions. FTIR confirmed functional groups such as C–O–C, phenolic O–H, and carbonyls, common among all the formulations, with H-bonded O–H bond vibration in *sauropus* based films. ICP-MS identified macro elements such as K: 568.21, Na: 222.92, Mg: 72.23, Ca: 19.74 mg/100g in *Alternanthera* based ODFs, K: 137.41, Na: 218.15, Mg: 151.11, Ca: 32.95 mg/100g were identified in *Sauropus*, while K: 537.34, Na: 187.09, Mg: 65.65, Ca: 37.97 mg/100g in *Momordica* based films and trace microelements Fe, Zn, Cu, Se, Mn, Cr and Co were also identified. *A. sessilis*-based ODFs showed superior physicochemical traits, while *Sauropus*-based ODFs exhibited comparatively high mineral content, and 136 distinct phytonutrients (phytochemicals) with potential antioxidant potential confirming their promise as sustainable, bioactive carriers for personalized nutrient delivery in athletes



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sciforum-143841: Effects of Early Time-Restricted Eating (eTRE) on Postural Mobility, Body Composition, and Energy Intake in Judo Athletes

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Background

Maintaining balance, agility, and optimal body composition is critical in judo, but the potential role of nutritional strategy such as early time-restricted eating (eTRE) in enhancing these factors has not been fully explored.

Aims

This study aimed to investigate the impact of eTRE on postural mobility performance in judo athletes, along with changes in anthropometric measures and daily energy intake.

Methods

In this randomized controlled trial, twenty-four young judokas were randomly assigned to either an experimental group (EXP, 21.58 ± 2.19 years, 175.58 ± 5.99 cm, 74.33 ± 5.4 kg, n = 12) or a control group (CON, 22.33 ± 1.92 years, 176.08 ± 6.30 cm, 75 ± 6.79 kg, n=12). Participants completed two test sessions assessing postural mobility using the Walk Across (WA), conducted before (T1) and after (T2) a 4-week eTRE intervention. Anthropometric measures and daily energy intake were also recorded.

Results

At T2, the EXP group showed significant reductions in total daily energy intake, body mass, body mass index, and body fat compared with the CON group ($p < 0.001$ for all). In the WA test, both movement speed and step length increased from T1 to T2 in the EXP group and were significantly greater than those of the CON group. Post-intervention, movement speed was 86.65 ± 6.06 cm/s in EXP group vs. 82.65 ± 4.95 cm/s in CON group ($p < 0.001$). While step length was 75.64 ± 3.19 cm in EXP group vs. 71.24 ± 5.15 cm in the CON group ($p = 0.003$). Step width showed no significant difference between the groups.

Conclusion

While eTRE may reduce body mass and fat, it also appears to enhance postural mobility performance in judo athletes without affecting step width.



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sciforum-149084: Effects of the Ketogenic Diet on Athletic Performance: A Systematic Review

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Background

In recent years, the ketogenic diet (KD) has gained popularity beyond clinical settings, reaching the sports domain. Evidence suggests KD may enhance aerobic endurance through increased lipid oxidation and reduced reliance on muscle glycogen. Conversely, high-intensity and anaerobic performance can be compromised due to limited glucose availability. Individual responses may vary depending on training type and adaptation duration. This systematic review critically evaluates the effects of KD on athletic performance, examining metabolic adaptations and performance outcomes across endurance and anaerobic disciplines.

Methods

A systematic search of PubMed and ClinicalTrials.gov was conducted for studies published from 2015 to 2025. Randomized controlled trials (RCTs) and non-randomized trials (No-RCTs) including trained athletes or physically active individuals were selected. Inclusion criteria required quantitative performance and metabolic outcome measures. Clinical populations, sedentary individuals, and subjects with pre-existing metabolic disorders were excluded. Fifteen studies meeting these criteria were analyzed.

Results

KD improved aerobic endurance in endurance-trained athletes via increased fat oxidation and reduced glycogen dependency. Anaerobic and high-intensity performance was often impaired, particularly during initial adaptation (4 weeks), due to limited glucose availability. Adaptation periods exceeding four weeks mitigated some negative effects on anaerobic capacity. Inter-individual variability was evident, influenced by training type and body composition.

Conclusions

KD may serve as an effective nutritional strategy for endurance athletes, provided sufficient adaptation time is allowed. In anaerobic and power sports, KD should be applied cautiously, as reduced glycogen may compromise rapid energy production. Performance outcomes depend on adaptation duration, discipline, and individual characteristics. Further research is warranted to clarify the effects of genetics, adaptation length, and sport-specific energy demands.



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sciforum-142460: Food and beverage intake habits in handball: relationship with gender and competitive level

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Handball is a complex sport, played by both men and women. In order to cover the nutritional requirements, a correct dietary-nutritional planning must be carried out. Therefore, the aim of the study was to describe and evaluate the food, water and alcohol intake of handball players according to gender and competitive level. A descriptive cross-sectional study was conducted in 348 handball players (22.49 ± 4.11 years, 158 of them being women and 190 men, all of them of legal age) from Spanish leagues completed a self-administered, semi-quantitative food and beverage intake questionnaire. It was observed that men ate more frequently white meat, red meat, soft drinks and prepared/frozen foods ($p=0.001-0.029$), and women ate more frequently rice ($p=0.021$). In terms of competitive level, those in the honor division ate more frequently fruit and vegetables and less frequently soft drinks ($p=0.001-0.014$). The most frequent reasons for following a diet were performance (15.7%) and health (22.9%). Men drank more frequently water than women during the day and during training ($p=0.001-0.022$). On the other hand, water intake habits during training increased as the competitive level increased ($p=0.048$). Most players drank alcohol at least once or between once and twice a week. In conclusion, differences in food and water intake habits were observed according to gender and competitive level. These data favour the advancement of the understanding of the impact that nutrition has on each of the players. Consequently, with this knowledge, dietary recommendations and guidelines in handball can be improved.



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sciforum-144160: Nutrigenomic Modeling of Performance Phenotypes in Sport: An Evidence-Based Systematic Review

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The efficacy of high-intensity physical workouts can be optimized by tailoring nutritional tailored interventions specific to an athlete's genetic traits to account for intrinsic and extrinsic factors. In the area of sports, nutrigenomics focuses on how genetic variants modulate the response to nutrients and dietary supplements, thereby affecting endurance, power, and recovery. For instance, ACTN3 and ACE genes are linked to key performance (Pe) factors, while COL1A1 and COL5A1 polymorphisms are correlated with a higher predisposition of tendon injuries. Following PRISMA guidelines, a systematic review was conducted in the databases PubMed, Scopus, and Web of Science (2019-2024). Then, articles were screened that establish a relationship of genetic variants, nutrient response, and athletic Pe. The objective of this review is to critically evaluate the existing body of evidence on the influence of nutrigenomics on metabolic and phenotypic modulation of athletic Pe to support the implementation of personalized nutritional (PN) interventions. Data reveal over 250 genetic variants linked to athletic phenotypes. Of these, the most robust evidence is the ergogenic effect of caffeine on Pe, which is modulated by variants of the CYP1A2 gene. Statistically significant interactions were also found between genotypes and responsiveness to nutrients such as fatty acids, antioxidants, and proteins, all which impact recovery and injury prevention. Yet, methodological heterogeneity, insufficient cohort of athletes, ethical limitations, and costs restrict the direct application of these outcomes to sports clinical practice.



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sciforum-131938: Nutrition Knowledge, Dietary Habits, and Dietary Intake of Collegiate Athletes Living in Selected Rural and Urban Area in the Philippines

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Nutrition is crucial for athletic performance, but geographic location may create disparities. Dietary habits, or typical food and beverage consumption patterns, influence athletes' health and performance, and access to nutritional resources may differ between urban and rural collegiate athletes. This study aims to assess and compare nutrition knowledge, dietary habits, and dietary intake among collegiate athletes from urban and rural areas. It is hypothesized that these factors will differ significantly between the two groups.

This cross-sectional descriptive-comparative study assessed the nutrition knowledge, dietary habits, and dietary intake of basketball and volleyball players from selected urban and rural areas using a validated questionnaire (Lee-Pineda et al. 2021). Scores were classified as poor (55%), fair (55–69%), good (70–84%), or excellent (85–100%). An independent-samples t-test was used to compare the mean values between the two groups.

A total of 140 participants aged 18–23 years were included, evenly split between urban (n = 70) and rural (n = 70) areas. The sample comprised 86 males and 54 females. The study revealed that 67.14% from urban of and 68.57% from rural area had “Good” nutritional knowledge, while 62.86% from urban and 51.43% from rural area had “Fair” dietary habits. Coaches (60.71%) and social media (55.00%) were the top sources of nutritional information. Additionally, 86.43% had not attended any nutrition-related seminars or courses in the past. Statistical analysis showed a significant difference in dietary habits between urban (M = 48.09, SD = 4.63) and rural participants (M = 50.37, SD = 4.63), $t(138) = -2.29$. However, no significant difference was found in nutritional knowledge between urban (M = 85.26, SD = 8.93) and rural (M = 85.01, SD = 10.50) athletes, $t(138) = 0.15$. Dietary intake differed by residence, with urban athletes showing more inadequacies and rural athletes more often meeting or exceeding recommended nutrient intakes.

There is a potential gap in nutritional practice, suggesting that while athletes may possess information, they often fail to apply it in daily food choices underscoring the need for targeted nutrition education programs and the promotion of evidence-based guidance.



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sciforum-146008: Nutritional Knowledge, Dietary Mistakes, and Supplement Use Among Amateur American Football Players

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Background

Nutritional knowledge is a key determinant of dietary behavior in athletes, yet a gap often exists between awareness and practice. Amateur American football players represent a unique population with high physical demands but limited access to professional nutrition support. Understanding their nutritional literacy, common dietary mistakes, and supplement use patterns can inform targeted interventions to improve performance and health.

Aim

To assess the level of nutritional knowledge, identify prevalent dietary mistakes, and analyze supplement use among amateur American football players.

Methods

A cross-sectional survey was conducted among [n = 53] male amateur American football players aged range 23 years. The questionnaire included items on meal frequency and timing, consumption of key food groups, intake of sugar-sweetened beverages and fast food, self-perceived nutritional knowledge, and supplement use. Descriptive statistics were applied to summarize findings, and associations between knowledge level and dietary behaviors were explored.

Results

While a majority of players reported moderate to high self-perceived nutritional knowledge, discrepancies were observed between knowledge and practice. Frequent dietary mistakes included irregular meal timing, excessive consumption of sugar-sweetened beverages, and high fast-food intake. Vegetable consumption was generally adequate, but protein sources were often limited to processed meats. Supplement use was reported by a substantial proportion of players, with protein powders, creatine, and multivitamins being the most common. However, supplement choices were not always aligned with evidence-based recommendations or individual training needs.

Conclusions

Despite reasonable nutritional awareness, amateur American football players exhibit dietary patterns that may compromise performance and recovery. Education strategies should focus on translating knowledge into consistent healthy practices, reducing high-sugar and high-fat food intake, and promoting informed, evidence-based supplement use.



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sciforum-149149: The Role of Nutrient and Activity Timing in Healthy Aging: A Conceptual Perspective

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Introduction

Lifestyle behaviors such as diet and physical activity are key determinants of healthy aging. In sports science, the timing of nutrient intake and exercise has been widely discussed in relation to muscle adaptation, recovery, and performance. However, the temporal dimension of these behaviors remains underexplored in older, physically active adults, despite its potential relevance for maintaining functional capacity and long-term health.

Methods (Conceptual Approach)

This perspective outlines a conceptual framework for investigating how the alignment of meal timing and physical activity patterns could influence metabolic and inflammatory markers in adults aged 50 years and above. Rather than presenting empirical data, the framework integrates insights from sports nutrition with gerontological perspectives, emphasizing the need for both observational and interventional studies.

Expected Insights

Drawing on existing literature, it is hypothesized that nutrient timing in relation to exercise may play a role in muscle preservation, inflammation control, and metabolic health. Extending these insights to aging populations could inform personalized strategies that optimize both health and functional performance.

Conclusions

By adapting principles from sports nutrition, this conceptual perspective highlights a promising but underexplored avenue for promoting healthy aging. Future research is essential to test the feasibility and impact of lifestyle timing strategies, potentially translating findings from athletic contexts into practical applications for older adults.

Keywords: healthy aging; nutrient timing; physical activity; sports nutrition; personalized strategies; muscle maintenance



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Session 2. Innovations in Sports Supplements

sciforum-147031: Impact of p-Synephrine Supplementation on Biomarkers of Health and Performance in Physically Active Healthy Adults: A Systematic Review of Clinical Trials

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p-Synephrine is a natural protoalkaloid present in *Citrus aurantium* used in the dietary supplement market for weight control and weight reduction, due to its supposed thermogenic effects and its influence on metabolism. The purpose of this research was to determine the effects of p-synephrine supplementation on healthy physically active adults on health biomarkers and physical performance. Following the Preferred Report Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, studies indexed in the following three databases were systematically reviewed: Medline (PubMed), SCOPUS and CINAHL. Original studies published from 2010 to 15 of August of 2025 with a controlled trial design comparing p-synephrine supplementation with a control group were included. The PEDro scale and the McMaster questionnaire were used to analyze methodological quality, and the Cochrane bias assessment tool was used. From the 103 records identified, only 7 met the inclusion criteria. Overall, p-synephrine has a significant increase ($p < 0.05$) on fat oxidation. At the same time, the supplement significantly decreased ($p < 0.05$) carbohydrate oxidation and exhibited a non-significant tendency ($p > 0.05$) to increase tympanic temperature. However, no changes were observed on cardiovascular biomarkers, anthropometric parameters, glycemia or total cholesterol. Regarding sports performance, p-synephrine supplementation improved significantly ($p < 0.05$) on the number of repetitions and maximum carbon dioxide volume. On the other hand, non-significant increases ($p > 0.05$) were observed in mean velocity and maximum oxygen volume. In conclusion, p-synephrine is a safe supplement that modulates metabolism of certain energy substrates, specifically by increasing fat oxidation and decreasing carbohydrate oxidation during exercise, providing an indirect ergogenic effect. Finally, no serious adverse effects were reported. These findings suggest that p-synephrine may be a safe and potentially useful supplement, although further studies are needed to confirm its long-term efficacy and metabolic impact.



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sciforum-143923: Description of Dietary Supplement Consumption Practices Among Athletes in the City of Oujda, Morocco

Meryem Zouarhi *, Hicham Elmsellem, Houda Hmyi, Oumaima Drissi, Smahane Tidaoui, Faiza Souna, Tarik Chelfi, Fouad El-Kalai, Mohammed Kaddouri and El Bekkay Yousfi

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The use of dietary supplements has been steadily increasing year after year, in parallel with the growth of their commercialization. This trend reflects a significant expansion of the supplement market, particularly among athletes who often seek enhanced physical performance and faster recovery.

In this context, the present study aims to describe the consumption practices of dietary supplements among athletes in the city of Oujda, Morocco. It is a descriptive cross-sectional study conducted in various gyms, involving 300 male and female participants of different age groups and athletic backgrounds.

Data were collected using a structured questionnaire focusing on consumption frequency, underlying motivations, types of supplements used, sources of information, and perceived health effects.

The results show that 64% of participants reported consuming dietary supplements, mainly to improve physical performance or increase muscle mass. The most commonly consumed category was vitamins (29%), followed by proteins and amino acids (26%).

The most cited sources of information included the internet and social media (28%), sports coaches and peers (25%), while only 17% consulted healthcare professionals.

Regarding risk perception, 28% of respondents mentioned the possibility of drug interactions, 22% reported experiencing adverse effects such as digestive issues, fatigue, or insomnia, and 9% discontinued use due to these effects.

This study highlights the prevalence of self-directed, medically unsupervised supplement use among athletes, with potential health implications including accidental doping.



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sciforum-144845: Effects Of Beta-Alanine Supplementation On Neuromuscular And Cardiovascular Performance In Female Rugby Players

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Introduction

Beta-alanine (BA) is an ergogenic aid known to increase intramuscular carnosine concentrations, thereby enhancing the muscle's buffering capacity during high-intensity exercise. Its ergogenic effects have been primarily reported in activities relying on anaerobic metabolism. In rugby, performance in tasks requiring anaerobic energy pathways—such as sprinting and jumping—is essential. However, evidence regarding the effects of BA supplementation in female rugby players remains limited. Thus, the aim of this study was to evaluate the effects of BA supplementation on neuromuscular and cardiovascular performance in this population.

Methods

A randomized, double-blind, placebo-controlled trial was conducted with ten female rugby players competing in Spain's first division. Participants were assigned to receive either 6.4 g/day of BA or an isocaloric maltodextrin placebo for six weeks. The testing battery included assessments of isometric handgrip strength, countermovement jump, squat jump, modified agility T-test, repeated sprint ability test, and the Bronco Test. The study protocol was approved by the Institutional Ethics Committee (22/070-EC_X_TFM).

Results

No statistically significant differences were observed between groups in any neuromuscular or cardiovascular performance variables ($p > 0.05$). Nonetheless, the BA group exhibited a consistent trend toward improved performance across all assessed outcomes.

Conclusion

Six weeks of BA supplementation did not elicit significant improvements in aerobic or anaerobic performance among female rugby players. Further studies with larger and more representative samples are warranted to determine whether BA supplementation can serve as an effective ergogenic strategy in this athletic population.



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sciforum-144088: From Label to Scoop: Profiling Ingredient and Nutrient Labelling Patterns in Commercially Available Protein Supplements

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Introduction

Protein supplements are integral to the diets of athletes and active individuals, offering convenient support for muscle synthesis, recovery, and performance. However, variations in nutrient composition, ingredient use, and labelling transparency may influence product quality and consumer choice. This study evaluated the nutrient composition and ingredient profiles of commercially available protein powders, with a focus on protein and sodium content.

Methods

A content analysis was conducted on 204 protein powder products available on the TruthIn app uploaded by the Indian users. Nutrient data for protein and sodium were extracted from product labels, and ingredient lists were recorded verbatim. Frequencies and proportions were calculated for labelling of essential amino acids (EAA) and branched-chain amino acids (BCAA), as well as for different protein sources, additives, and formulation patterns.

Results

Protein content per 35 g serving ranged from 15% to 90%, with products at the lower end often containing fillers such as maltodextrin. Sodium content ranged from 0.5 mg to 465 mg per serve; 85.3% of products labelled sodium, 47.5% labelled EAA, and 42.2% labelled BCAA. Whey protein was the predominant source (84.3%), followed by soy (5.9%), pea (5.4%), hemp (1.5%), and milk-based proteins (2.9%). Notably, soy protein products tended to have higher sodium content compared with other protein types. Artificial sweeteners were present in 46.1% of products, thickeners and stabilisers in 47.1%, emulsifiers in 25%, and digestive enzymes in 43.6%. Natural colouring agents were found in 9.8% of products, and probiotics/prebiotics in fewer than 5%.

Conclusions

The analysis highlights wide variation in protein content, sodium levels, and ingredient formulation among protein supplements. While many products feature innovative combinations of protein sources and functional additives, inconsistent amino acid labelling remains a limitation. Improved labelling transparency could better support athletes and practitioners in making performance-oriented choices and foster innovation in sports supplements.



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sciforum-142459: Nitrate and Beetroot Juice Claims on Sports Supplement Labeling. Analytical Assessment According to Scientific Evidence and Criteria

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Nitrates are a supplement widely consumed by athletes, especially elite athletes, although until now, there has been no regulation of their labelling in terms of dosage, protocols, effects... The aim of this study is to analyse the claims, dosage, protocols, formats and advertising aspects in the labelling of nitrate supplements, and to check that they follow the criteria of current evidence and international consensus. An observational cross-sectional study was conducted to analyze the content and the degree to which claims stated on the labeling or technical data sheets of nitrates supplements comply with those authorized by current European legislation and supported by existing scientific evidence. The products were searched for using Amazon and Google Shopping. 18 supplements showed that only 27.8% showed 1 of the recognised, evidence-supported claims, the amount of nitrates on the label was in most cases within the recommendations (61.1%). 'Improves performance' and "Improves exercise efficiency" were the statements that were in line with the evidence. The remaining claims were inadequate or partially adequate and should be removed or modified. 55% of the sample had celebrities or influencers as claims and about 50% had an anti-doping seal. None of the external supplements were externally endorsed. This study shows that the supplements studied should modify their claims, as most of them do not comply with the recommendations of the main international organisations, and should present a recognised anti-doping seal to guarantee the absence of doping agents.



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sciforum-149580: Nutritional characterization of *Lupinus angustifolius* flour and protein isolate as sustainable plant-based ingredients for sports supplements

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The Uruguayan agricultural system seeks profitable and sustainable crops, among which *Lupinus angustifolius* shows remarkable adaptability. Although its current use in the country is mainly restricted to animal feed, the growing demand for sports supplements based on innovative, protein-dense plant ingredients positions this species as a promising alternative. This work aimed to characterize flour (LF) and protein isolate (LPI) from *Lupinus angustifolius* seeds to assess their potential in sports supplements.

Proximate analysis of both samples was carried out according to AOAC protocols (1999), fatty acid determination by gas chromatography following IUPAC (1987, methods 2.301 and 2.304), amino acids were analyzed using an automatic analyzer (Biochrom30, Biochrom Ltd., UK) by ion exchange chromatography with post-column ninhydrin derivatization (Spackman et al., 1958)

The characterization of LF revealed a content of 35.1±0.1% protein, 40.4±0.7% dietary fiber, and 7.4±0.2% lipids. The lipid fraction was dominated by unsaturated fatty acids, mainly oleic (39.2±0.0%) and linoleic (38.0±0.1%), together with α-linolenic (3.5±0.1%). The amino acid profile showed a balanced contribution, with leucine, lysine, and isoleucine exceeding FAO recommendations; glutamate and aspartate were also present in relevant amounts for energy metabolism and muscle recovery. LF provided essential minerals (mg/100g): calcium 265.5±17.9, magnesium 185.03±8.45, potassium 841.1±96.9, iron 6.23±0.01, and zinc 2.8±0.3.

LPI presented 85.2±1.6% protein, 6.4±0.3% fiber, and 3.7±0.0% lipids. Its amino acid profile was characterized by high levels (g/100g protein) of leucine (6.28±0.80), phenylalanine (4.10±0.50), and isoleucine (3.20±0.41), all associated with muscle protein synthesis. Despite the lower lipid content, unsaturated fatty acids remained predominant.

In conclusion, LF and LPI provide high-quality proteins enriched in essential and branched-chain amino acids, together with fiber, unsaturated fatty acids, and key minerals. These attributes align with current evidence supporting amino acids as ergogenic aids, positioning lupin as a sustainable source for developing plant-based supplements aimed at enhancing performance and recovery.



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sciforum-141876: Preclinical evaluation of the consumption of high-protein vegetable-based cookies

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Introduction

In the current field of sports nutrition, developing functional foods through innovation is crucial for enhancing physical performance, aiding recovery, and promoting overall athlete health. Plant-based protein-rich products present a promising alternative to traditional sources, offering nutritional benefits, reducing environmental impact, and gaining acceptance among consumers seeking sustainable and ethical options. This study focused on creating high-protein plant-based cookies and conducting a preclinical evaluation of their effects.

Material and methods

The cookies developed have a high crude protein content (13.32 g), which, according to current regulations, classifies them as a high-protein product. They also contain 12.92 g of fat, 6.78 g of fiber, and 2.9 g of ashes. The biological assessment involved 12-week-old Wistar rats (6 males and 6 females) with an average weight of 200 g, divided into two groups: one experimental group that received cookies and one control group maintained on a standard diet. The product was administered daily for 15 days at an average dose of 5.3 g/kg body weight/day of cookies, based on an estimated human intake of 60 g/day for a 70 kg person, using the Food and Drug Administration (FDA) recommended interspecies correction factor. Physiological parameters such as body weight, glucose, cholesterol, triglycerides, urea, creatinine, muscle thickness in the biceps, gastrocnemius, and abdomen, as well as grip strength, were monitored. Statistical analysis was performed with GraphPad Prism software V6.

Results

No significant changes were observed in biochemical parameters between baseline and post-treatment or compared with the control group. However, increased muscle thickness was found in the biceps and gastrocnemius of male rats, and grip strength improved in all treated animals.

Conclusion

These findings suggest that consuming high-protein vegetable cookies is safe in preclinical settings and does not affect key biochemical markers. Their intake may promote functional improvements such as muscle strength and lean mass development, especially in males.



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sciforum-147956: The Mineral Content of *Camellia japonica* Leaves and Their Potential as a Functional Food in Sports Nutrition

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Camellia japonica is a widely cultivated ornamental plant that also contains significant amounts of bioactive compounds, including polyphenols and essential minerals. Despite its distribution across Asia and Europe, the nutritional profile of *C. japonica* remains largely unexplored compared to other members of the *Camellia* genus, such as *C. sinensis*. This study aimed to characterize the mineral composition of *C. japonica* leaves and assess their potential relevance for sports nutrition. Analysis revealed that *C. japonica* leaves are particularly rich in calcium (≈ 8.3 g/kg) and magnesium (≈ 1.4 g/kg), as well as substantial potassium levels. These minerals are critical for athletic performance: calcium supports bone integrity and muscle contraction, magnesium contributes to energy metabolism and neuromuscular function, and potassium maintains electrolyte balance and hydration. Ensuring adequate intake is especially important for athletes engaged in high-intensity or endurance activities, where increased metabolic demands and sweat losses can compromise performance. ¹²Beyond their mineral content, *C. japonica* leaves may provide antioxidant compounds capable of mitigating exercise-induced oxidative stress and inflammation. The incorporation of *C. japonica* leaf extracts into functional foods or plant-based sports supplements offers a sustainable and locally sourced alternative to conventional supplementation. Future studies should focus on the bioavailability, safety, and efficacy of these extracts in athletic populations, paving the way for innovative nutritional strategies that enhance both performance and sustainability.



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Session 3. Gender-Specific Strategies in Sports Nutrition

sciforum-149550: Effectiveness of Whatshap-based Nutrition Coaching to Promote Gender Specific Dietary Practices and Performance Outcomes among Adolescent Athletes in Rural Nigeria

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Introduction

Adolescent athletes need gender-specific diet for health, development, and performance. Sports nutrition advice is scarce in rural Nigeria, and gender norms influence eating habits. WhatsApp is a cost-effective and scalable platform for individualized nutrition coaching due to smartphone penetration. WhatsApp-based nutrition coaching improved gender-specific eating habits and performance indicators in rural Nigerian adolescent athletes.

Methods

A quasi-experimental pre-post study was done with 80 adolescent athletes (40 males, 40 girls; ages 14–19) from four rural secondary schools in Oyo State. Measuring instruments includes, Nutrition knowledge (15-item WhatsApp quiz), dietary diversity (3-day food picture diaries assessed using the FAO dietary diversity tool), anthropometry (BMI-for-age), and performance measurements (20m shuttle run, 100m sprint, handgrip strength). Participants received daily instructions and engaging feedback for six weeks of gender-specific WhatsApp coaching. All baseline metrics were repeated post-intervention. Paired t-tests and ANCOVA were used for analysis, with significance set at $p = 0.05$.

Results

Nutrition knowledge significantly increased from 6.8 ± 2.1 to 10.9 ± 2.4 ($p = 0.001$). Females showed greater improvement in diet diversity scores ($+1.9$ vs. $+1.4$; $p = 0.03$), increasing from 4.2 ± 1.1 to 5.8 ± 1.3 ($p = 0.001$). Performance outcomes improved: VO_2 max increased by 2.3 ml/kg/min ($p = 0.002$), sprint times decreased by 0.6 seconds ($p = 0.01$), and handgrip strength increased by 3.1 kg ($p = 0.004$). Gender analysis showed that females improved eating habits while males improved sprint performance. Message response rate was 92.5%.

Conclusion

WhatsApp-based nutrition coaching enhanced rural Nigerian adolescents' gender-specific diets and physical performance. The results demonstrate the feasibility, scalability, and importance of adding simple, culturally appropriate digital interventions into African school sports and nutrition programmes.



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sciforum-148910: Homocysteine, Gender, and Physical Activity: The Role of B-Vitamin and Folate Supplementation – A Systematic Review

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Introduction

Elevated plasma homocysteine is an established risk factor for cardiovascular and metabolic diseases. Its regulation is influenced by genetic polymorphisms, gender, hormonal status, nutritional intake, and lifestyle habits. While women generally present lower homocysteine levels compared to men, particularly before menopause, sedentary behavior and inadequate intake of B-vitamins and folate may increase concentrations. Regular physical activity and supplementation with vitamin B6, vitamin B12, and folic acid are considered effective strategies to reduce homocysteine, but evidence on their combined effects across gender and activity levels remains inconsistent.

Methods

A systematic literature search was conducted in PubMed, Scopus, and Web of Science up to August 2025, following the PRISMA guidelines. Studies were included if they reported plasma homocysteine levels stratified by gender or physical activity status, with or without supplementation of vitamin B6, vitamin B12, and/or folate. Both observational and interventional studies were considered. Data were extracted on study design, population, supplementation regimens, physical activity level, and outcomes.

Results

Across the included studies, women showed consistently lower baseline homocysteine levels than men, with differences narrowing after menopause. Regular physical activity was associated with modest reductions in homocysteine, although the effect varied according to intensity, duration, and training status. Supplementation with B6, B12, and folate produced significant reductions in plasma homocysteine across all groups, with the largest absolute decreases observed in sedentary individuals and in men. Evidence on the interaction between gender, physical activity, and supplementation remains limited, and heterogeneity across studies prevented meta-analysis.

Conclusions

This systematic review highlights that homocysteine levels are modulated by gender, lifestyle, and nutritional supplementation. B-vitamin and folate supplementation is effective in lowering homocysteine, with potentially greater benefits in high-risk groups such as men and sedentary individuals. Further high-quality trials are needed to clarify the synergistic role of gender and physical activity in homocysteine metabolism



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sciforum-149600: Optimising Performance Through Gender-Specific Sports Nutrition: A Systematic Review

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Sports nutrition has often emphasised generalised dietary strategies, yet important biological and physiological differences between male and female athletes are frequently overlooked. Gender-specific approaches may optimise performance, recovery, and long-term health. This systematic review evaluates evidence on nutrition strategies tailored to male and female athletes.

A comprehensive search of PubMed, Scopus, and Web of Science was conducted for studies published between 2014 and 2024. Eligible articles included randomised controlled trials, cohort studies, and systematic reviews reporting outcomes separately by gender. Data extraction focused on macronutrient utilisation, micronutrient requirements, supplementation practices, and recovery strategies.

Results highlight clear gender-related differences. Female athletes demonstrate greater reliance on lipid oxidation during endurance exercise and may benefit from carbohydrate periodisation aligned with hormonal fluctuations. Iron, calcium, and vitamin D are critical nutrients for women due to higher deficiency risks, especially in weight-sensitive sports. Male athletes, with higher lean body mass, require greater absolute protein intake, and show stronger responses to creatine and beta-alanine supplementation. Evidence also indicates menstrual cycle phases influence hydration, carbohydrate metabolism, and recovery, reinforcing the need for individualised timing of nutrient intake.

In conclusion, gender-specific sports nutrition strategies can enhance performance and mitigate health risks by addressing differences in metabolism, hormonal status, and nutrient demands. Current findings support tailored interventions, but further longitudinal and intervention-based studies are required to develop robust, evidence-based guidelines for both male and female athletes across diverse sporting contexts.



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sciforum-123705: Sex-based differences in in-vitro protein digestibility and bioactive peptide release from bovine milk and oat drink: Implications for gender-specific sports nutrition

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Introduction

Understanding sex-based differences in nutrient utilization is critical for optimizing sports nutrition. This study investigates the *in vitro* digestibility of bovine milk and oat-based milk alternative, exploring the impact of sex on protein breakdown to inform gender-specific nutritional strategies.

Methods

A semi-dynamic *in vitro* digestion model was used to simulate male and female physiological conditions. Bovine milk and oat drink, along with their protein powder counterparts, were subjected to gastric and intestinal digestion. Proteolytic trajectories, peptide generation, and free amino acid (FAA) release were analyzed via LC-MS proteomic analyses and SDS-PAGE.

Results

Significant sex-based differences in protein clotting and breakdown were observed. Females exhibited higher efficiency in oat protein digestion, while males showed improved bovine milk protein digestion. Male gastric conditions liberated bioactive peptides with antimicrobial, DPP-IV inhibitory (dipeptidyl peptidase IV, involved in blood sugar regulation), and cholesterol-regulating activities from milk proteins. In females, gastric conditions led to the release of an osteoanabolic peptide, potentially beneficial given women's higher osteoporosis risk (affecting ~20% of women >50 years). FAA analysis indicated that women produced more FAA from oats, especially essential amino acids such as leucine (important for muscle protein synthesis), while men yielded more from milk proteins.

Conclusion

Sex significantly influences protein digestibility, impacting bioactive peptide release and FAA bioaccessibility. These findings suggest that gender-specific nutritional strategies, tailoring protein sources to optimize digestibility and harness the benefits of sex-specific peptide release, could enhance athletic performance and overall health. This research underscores the importance of considering biological sex in the design of future food products and dietary recommendations.



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sciforum-149428: Vitamin D Supplementation and Follow-Up: Comprehensive Monitoring of Blood Markers and Performance in Runners and Non-Runners During Autumn and Winter

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Introduction

Vitamin D is increasingly recognized for its roles in musculoskeletal and immune health, yet evidence on its functional impact in physically active versus sedentary populations remains limited.

Methods

We conducted a randomized trial in 47 healthy adults, stratified by physical activity (runners vs. non-runners) and supplementation status (2000 IU/day vitamin D via orodispersible films vs. no supplementation). Participants were assessed at baseline (October, T0), after 2 months of intervention (T1), and 3 months post-supplementation (T2). Outcomes included serum 25-hydroxyvitamin D [25(OH)D₃] levels, leukocyte counts, maximal oxygen consumption (VO₂max), maximal isometric force (MIF), and counter-movement jump (CMJ) performance. Diet, training load, solar irradiation, and ambient temperature were monitored longitudinally. An attempt was made to determine if gender influenced vitamin D levels.

Results

At T0, runners exhibited slightly insufficient but higher 25(OH)D₃ levels than non-runners, reflecting greater outdoor exposure. At T1, supplementation increased 25(OH)D₃ by 20.82% in runners and 28.78% in non-runners, whereas non-supplemented runners remained stable and non-supplemented non-runners decreased by 32.23%. At T2, all groups experienced significant declines, with non-supplemented non-runners approaching deficiency. Neutrophil counts fell in non-supplemented groups, while VO₂max and CMJ performance were unaffected; MIF showed modest improvement in supplemented subjects. Gender didn't influence the vitamin D level.

Conclusions

Two months of vitamin D supplementation effectively improved 25(OH)D₃ status and stabilized leukocyte counts in both runners and non-runners; however, discontinuation resulted in rapid declines. Despite correction of vitamin D insufficiency, no ergogenic benefits were observed in aerobic capacity or explosive power, and the modest gain in muscle strength warrants further investigation.



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Session 4. Nutrition for Recovery and Injury Prevention

sciforum-143361: "Botanical Nutrition: The Roles of Ginseng and Turmeric in Sports Performance and Recovery"

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Abstract

Introduction

Botanical nutrition is being progressively explored in sports science for its potential to enhance athletic performance and support recovery. Among various herbal supplements, Panax ginseng and Curcuma longa (turmeric) stand out for their physiological and therapeutic properties. Ginseng is known for its adaptogenic effects, which may help improve endurance, reduce fatigue, and support stress resilience. Turmeric, rich in curcumin, is widely recognized for its anti-inflammatory and antioxidant capabilities that can benefit post-exercise muscle recovery and reduce exercise-induced stress. This study investigates the effects of ginseng and turmeric, both separately and in combination, on physical performance and recovery in trained individuals.

Key Findings

Ginseng is a performance enhancer which boosts stamina and energy levels, improve focus and reaction time, and most commonly used in endurance and cognitive support formulas. Ginseng supplementation is associated with improvements in endurance and reduced fatigue during physical exertion.

Turmeric acts as a recovery agent by reducing inflammation and Delayed Onset Muscle Soreness (DOMS), supporting joint and muscle recovery, combating oxidative stress after intense training. Turmeric helps alleviate muscle soreness and lowers markers of inflammation after intense exercise.

The combination of both botanicals may lead to the most significant benefits, enhancing physical performance, accelerating recovery, and reducing oxidative stress.

Conclusion

The ginseng and turmeric offer valuable support for athletes, with ginseng contributing to improved stamina and turmeric aiding in recovery. When used together, these botanicals may have complementary effects, enhancing both performance and post-exercise healing. Integration of natural botanical supplements into sports nutrition strategies, while emphasizing the need for further research in competitive athletic populations to determine optimal usage and long-term benefits.



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***sciforum-139765: Moringa oleifera* leaf extract mitigates dexamethasone-induced muscle atrophy in C2C12 myotubes**

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Muscle atrophy occurs in various physio-pathological conditions, including severe muscle injury, disuse, hormone imbalances, cancer, sepsis, and aging. A common feature of these conditions is the presence of cellular oxidative damage and pro-inflammatory processes. Dexamethasone (DEXA) is a synthetic glucocorticoid that is widely used as an anti-inflammatory agent. However, chronic DEXA treatment can lead to side effects such as diabetes mellitus, obesity and, ultimately, muscle atrophy.

There is ongoing research aimed at identifying tools to counteract muscle atrophy and improve the quality of life for affected individuals. Among the promising approaches, the use of plant-based extracts has garnered significant attention. In particular, *Moringa oleifera* leaf extracts (MOLE) has been shown to support muscle cells metabolism and mitigate the negative effects of oxidative stress.

In this study, we investigated the effects of MOLE on DEXA-induced muscle atrophy and the underlying mechanisms in C2C12 myotubes.

Exposure to 100 nM DEXA for 24 hours induced muscle atrophy, as evidenced by increased levels of the specific markers as MuRF-1 and Atrogin-1, and reduced levels of myosin heavy chain (MHC).

MOLE (0.15 mg/mg dried powder) was administered either concomitantly, or 24 hours before or after DEXA exposure.

MOLE treatment was effective in reducing atrophy markers and improving the status of C2C12 myotubes, as reflected by increased MHC levels and fiber size in all experimental conditions involving DEXA.

Interestingly, the most pronounced effects were obtained when MOLE was administered to cells that had already undergone DEXA treatment.

In conclusion, these findings suggest that MOLE can alleviate DEXA-induced muscle atrophy in C2C12 myotubes by reducing atrophic markers and restoring the proper myotubes phenotype.



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sciforum-148759: Are All Alpha-Lipoic Acid Dietary Supplements Equal in Quality and Performance?

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Introduction

Alpha-lipoic acid (ALA) is an antioxidant and mitochondrial enzymes cofactor that may selectively protect DNA and lipids from exercise-induced oxidative stress (1). In athletes, this has the potential to support muscle recovery and reduce cellular stress associated with intensive training. The concept of “mitochondrial nutrition” highlights nutrients such as ALA that can decrease mitochondrial damage and enhance antioxidant defense (2). Despite its popularity, an important question arises: do all commercial ALA dietary supplements (DS) deliver the same level of quality and performance?

Methods

We evaluated nine commercial ALA DS available on the Serbian market using European Pharmacopoeia tests for solid dosage forms, including disintegration and dissolution testing. This independent assessment aimed to verify whether these products meet the pharmaceutical quality standards expected for reliable performance.

Results

One formulation failed the disintegration test (Eur. Ph. 2.9.1.), as it did not disintegrate within 30 minutes. Three formulations failed the dissolution criteria (Eur. Ph. 2.9.3. and 5.17.1.), indicating that their release characteristics may compromise bioavailability and, consequently, their expected effects.

Conclusions

Our results demonstrate that the quality of ALA DS is inconsistent, raising important concerns for athletes, coaches, and sports nutritionists. Athletes and their support teams should prioritize certified, independently tested products to ensure efficacy, safety, and optimal recovery.

Fogarty MC, Devito G, Hughes CM, Burke G, Brown JC, Mceneny J, et al. Effects of α -lipoic Acid on mtDNA Damage after Isolated Muscle Contractions. *Med Sci Sports Exerc.* 2013 Aug;45(8):1469–77. Pagano G, Pallardó FV, Lyakhovich A, Tiano L, Fittipaldi MR, Toscanesi M, et al. Aging-Related Disorders and Mitochondrial Dysfunction: A Critical Review for Prospect Mitoprotective Strategies Based on Mitochondrial Nutrient Mixtures. *Int J Mol Sci.* 2020 Sept 25;21(19):7060.



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sciforum-148994: Effects of Cordyceps militaris Supplementation on Oxidative Stress and Muscle Damage Following Endurance Exercise

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Background

Cordyceps militaris (*C. militaris*, CM) is a fungus with a long history and is widely used in folk medicine. The present study aimed to examine the effects of a two-week CM supplementation on lipid peroxidation and muscle damage after exhaustion exercise.

Methods

Eight healthy men completed a double-blind, crossover trial, receiving either CM or a placebo for two weeks. After two weeks of supplementation, they performed an acute exhaustion exercise test at 80% VO_2max , with the treadmill exhaustion time recorded. Blood samples were collected before and after the exhaustion test to measure the biomarkers of lipid peroxidation, creatine kinase, and fatigue-related biochemical markers (glucose, lactate, ammonia).

Results

Our results showed no significant increase in treadmill exhaustion time with CM supplementation compared to the placebo trial. However, the MDA levels were significantly lower following the exercise challenge in the CM trial ($p < 0.05$), which reflects the effect of *Cordyceps militaris* in preventing lipid peroxidation induced by exhaustive exercise. However, there were no significant differences in fatigue-related biochemical markers or muscle damage biomarkers between the CM and placebo trials.

Conclusions

Based on the markers used in the present study, our results indicate that two weeks of CM supplementation may potentially prevent exercise-induced lipid peroxidation, but do not appear to influence muscle damage and fatigue-related biochemistry.



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sciforum-123994: Lactoferrin combined with Coenzyme Q10 ameliorate sarcopenia in an aging mouse model induced by D-galactose

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Sarcopenia is an age-related condition with a slow and prolonged decrease in muscular mass, strength, and function. As the population ages, the frequency of sarcopenia rises, and aggressive prevention methods and effective treatment options are in urgent need. Here, we explore the hypothesis that nutritional interventions can ameliorate skeletal muscle aging in mice affected by sarcopenia, and the aforementioned hypothesis was validated through histopathological characterization and behavioral experiments. The age-related sarcopenia model induced by intraperitoneal injection of D-galactose exhibited reduced muscle mass (Lean Mass, GAS Index), muscular strength (Maximum Limb Muscle Strength), and muscular function (Exhaustion Time, Inverted Grid Time), along with increased fat content and smaller myofiber size compared to the control group. Treatments with lactoferrin and CoQ10, both individually and in combination, enhanced muscle indices and facilitated muscle tissue regeneration, with the combined treatment showing the most significant improvement. Research further shows that Lactoferrin and CoQ10, whether administered alone or in combination, were discovered to restrain the progression of sarcopenia by inhibiting both protein metabolism and mitochondrial energy metabolism, and compared to groups treated with lactoferrin or CoQ10 alone, the combined treatment demonstrated varying degrees of improvement across all evaluated metrics, such as Lean Mass (2.273~5.365%), Fat Mass (-1.058~-0.359%), GAS index (0.259~0.335%), Maximum Limb Muscle Strength (6.83~53.498 g), Inverted Grid Time (563~859 s), Exhaustion Time (386~468 s). Therefore, lactoferrin and CoQ10, either alone or in combination, were found to inhibit the progression of sarcopenia by influencing the number and cross-sectional area of muscle fibers and muscle protein synthesis. The combined intervention appears to exert a more significant effect on energy metabolism.



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sciforum-144113: Management of Inflammation and Tendinitis Risk in Athletes with Omega-3: A Nutrigenetic-Based Personalized Approach

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Introduction

High inflammation levels and an increased tendinitis risk are key factors leading to performance decline, prolonged recovery, and recurrent injuries in athletes. The severity of these risks depends on each athlete's genetic profile. Variants in genes encoding inflammatory markers (*IL6*, *TNF*, *CRP*) and connective tissue components (*COL5A1*, *GDF5*, *MMP3*) affect injury susceptibility. *FADS1* and *FADS2* variants, involved in omega-3 metabolism, influence endogenous EPA/DHA synthesis and play a critical role in inflammation control. Nutrigenetic approaches enable the design of training and nutrition strategies tailored to biological needs.

Methods

Genetic markers related to inflammation, tendinitis risk, and omega-3 metabolism (*FADS1*, *FADS2*) were analyzed. Findings were interpreted using relevant literature and athlete health guidelines to develop individualized anti-inflammatory nutrition and injury-prevention strategies.

Results

Athletes with *IL6* G/C and *TNF* A/G variants showed a higher likelihood of prolonged inflammation after intense training. *COL5A1* TT and *MMP3* GG genotypes, linked to tendon elasticity and resilience, were associated with slower recovery after microtrauma. *FADS1* TT and/or risk genotypes in *FADS2* reduced the conversion of plant-derived omega-3 fatty acids to active EPA/DHA, indicating lower bioavailability. This suggests that standard omega-3 intake may be insufficient for some athletes, requiring individualized supplementation.

Conclusion

Genetic profiling shows that inflammation and injury risks vary between athletes. Nutrigenetic assessments allow the application of omega-3-supported anti-inflammatory nutrition with personalized dosage, duration, and composition. Tailoring omega-3 supplementation to *FADS1*/*FADS2* genotypes may improve recovery, lower injury risk, and support sustainable athletic performance.



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sciforum-149108: The Effects of a Multidisciplinary Residential Program on the Risk Factors of Sarcopenic Obesity: An Open-Label Trial Study in a Cohort of Institutionalized Italian Adults with Obesity

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Background

Sarcopenic obesity, defined as the coexistence of excess adiposity and reduced muscle mass/function, is associated with impaired mobility, reduced quality of life, and increased metabolic risk. According to the updated EWGSOP2 guidelines, sarcopenia should be identified primarily through low muscle strength, confirmed by reduced muscle quantity or quality, and its coexistence with obesity further amplifies health risks.

Objective

The aim of this study was to evaluate the impact of a multidisciplinary residential program (MRP) on risk factors of sarcopenic obesity in adults with obesity. Identifying strategies for this condition is therefore a growing clinical priority.

Methods

61 obese patients (36 women, 25 men; mean age 60.0 ± 13.5 years; BMI ≥ 30 kg/m² with metabolic comorbidities) completed a two-month MRP consisting of personalized nutritional counseling, structured physical activity, and psychological support. Anthropometric variables, body composition, and biochemical markers were assessed before and after the intervention.

Results

Participation in the MRP resulted in significant improvements in body composition and metabolic outcomes. Body weight (-6.4 kg), fat mass (-3.9 kg), visceral adipose tissue (-314 g), BMI (-2.45 kg/m²), and waist and hip circumferences were all significantly reduced ($p < 0.001$). Muscle function, assessed with the Short Physical Performance Battery (SPPB), significantly improved (+0.93 points, $p < 0.001$). Moreover, reductions were observed in fasting glycemia (-16.4 mg/dl), HbA1c (-0.81%), insulin (-2.77 mcU/ml), HOMA-IR, and lipid profile parameters: total cholesterol, LDL, and triglycerides. Although a modest decrease in lean mass was recorded (-0.8 kg), overall changes favored improved physical function. Patients lost weight and fat mass, with a slight loss of lean mass. They showed improved muscle function (SPPB) and metabolic profile (glucose, insulin, HbA1c, lipids).

Conclusions

These findings suggest that a structured, multidisciplinary residential approach can effectively improve body composition, metabolic health, and functional performance in obese patients at risk of sarcopenia, highlighting its value in clinical obesity management.



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Session 5. Sustainable Diets in Sport: Balancing Performance and Health

sciforum-149387: Sustainable Dietary Strategies for Enhancing Athletic Performance and Reducing Environmental Impact

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Background

Athletes, coaches, and sports nutritionists are reevaluating traditional high-protein diets based on animal products, as more people are becoming aware of climate change and the depletion of natural resources. People have long thought that these kinds of diets improve performance, yet they are bad for the environment. This study examines the potential of plant-based, sustainable eating patterns to preserve athletic performance while mitigating environmental impacts.

Methodology

A controlled experiment lasting 12 weeks was carried out with 84 endurance athletes, who were randomly divided into two groups. One group consumed a standard mixed diet, whereas the other group adhered to a sustainable diet prioritizing plant proteins, whole grains, and locally produced products. VO_2 max tests, time-to-exhaustion cycling trials, and measures of recovery quality were used to track nutritional adequacy and examine athletic ability carefully. We looked at the environmental effects of each diet by looking at the whole life cycle of food intake.

Results

People on the sustainable, plant-forward diet did not have a significant drop in VO_2 max or endurance compared to people on the traditional diet. Both groups saw similar improvements in recovery signs such as muscular pain and inflammatory markers. The sustainable diet group used 27% less water and made 32% less greenhouse gases than the regular diet group, which is really impressive.

Conclusion

The study shows that plant-based sustainable diets can help athletes perform better and recover faster without any drawbacks, and they can also greatly reduce their impact on the environment. This shows that nutrition plays two important roles: helping each person reach their full athletic potential and improving the health of the planet. Adopting these diets could help sports nutrition practices in the future find a balance between performance aims and environmental concerns.



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sciforum-143215: Time-Restricted Eating versus Calorie Restriction for the Management of Metabolic Syndrome and Implications for Physical Performance: A Systematic Review and Meta-analysis

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Background

Metabolic syndrome is a growing global health concern associated with an increased risk of cardiovascular disease and type 2 diabetes. Among various dietary interventions, Time-Restricted Eating (TRE) and Calorie Restriction (CR) are two prominent strategies used to manage metabolic parameters. Beyond their metabolic effects, emerging evidence suggests that TRE may also influence physical performance, body composition, and recovery, which are particularly relevant to athletes and physically active individuals.

Objective

To systematically compare the effects of Time-Restricted Eating versus Calorie Restriction on metabolic syndrome outcomes through a meta-analysis, while highlighting potential implications for physical performance.

Methods

A comprehensive literature search was conducted across PubMed, Scopus, Web of Science, and Cochrane Library for studies published up to June 2025. Studies comparing TRE and CR in adults with metabolic syndrome were included. Data were extracted and analyzed using random-effects meta-analysis, with standardized mean difference (SMD) as the outcome measure. Heterogeneity, publication bias, and study quality were assessed.

Results

Nine studies met the inclusion criteria. The pooled estimate showed a significant benefit of TRE over CR for improving metabolic outcomes (SMD = -0.396; 95% CI: -0.479 to -0.313; p 0.001). No significant heterogeneity was detected ($I^2 = 0\%$, $p = 1.000$). In addition to metabolic improvements, findings from studies in athletes and active populations indicate that TRE may enhance endurance, support favorable body composition changes, and promote recovery without impairing performance.

Conclusion

Time-Restricted Eating appears more effective than traditional Calorie Restriction in improving metabolic parameters in individuals with metabolic syndrome, with added potential benefits for physical performance. TRE may represent a sustainable dietary strategy with both clinical and athletic applications. Further high-quality, long-term trials are warranted to validate these findings in diverse populations, including athletes.



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sciforum-144010: Quantitative Analysis of Anthocyanins in Natural Fruit Juices and Evidence-Based Rationale for Their Inclusion as Bioactive Agents in Individuals with Increased Physical Activity

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For the last few decades, plant bioactive molecules in various formulations as herbal medicines or dietary supplements, are increasingly recommended for enhancing overall psycho-physical performance and resilience. The focus is directed towards natural sources of antioxidants, which not only provide health protection but also contribute to enhancing physical performance, accelerating recovery, and reducing oxidative stress through sports nutrition. Supplementation with anthocyanins has been identified as a means to accelerate recovery following intense physical activity, reduce inflammatory processes, and modulate vascular function in both recreational and professional athletes.

Main aim of this study was to perform quantitative analysis of anthocyanins in few natural fruit juices, obtained from *Punica granatum* (pomegranate), *Vaccinium myrtillus* (bilberry), *Vitis vinifera* (grape), *Sambucus nigra* (elderberry), and *Aronia melanocarpa* (chokeberry) that have been found locally in the region of North Macedonia. Additionally, several other parameters were evaluated including pH, organic acid content, Brix values, in order to serve as evidence for their rational use as nutritional and functional potential for targeted supplementation.

The results indicated significant variations depending mainly on the type of fruit the juices were obtained from. Pomegranate and bilberry juices exhibited the lowest pH values (3.16 and 3.29, respectively), consistent with conditions favoring anthocyanin stability. Pomegranate and elderberry samples demonstrated the highest titratable acidity. Chokeberry juice recorded the highest Brix value (26.2 °Brix), reflecting elevated levels of soluble solids. Elderberry juice demonstrated the highest measured concentration of total anthocyanins (>3.20 mg/L) and the highest measured concentration of monomeric anthocyanins (>1,50 mg/L).

These findings provide evidence that natural fruit juices rich in anthocyanins represent an easily accessible and nutritionally valuable alternative to synthetic supplements, particularly in the context of sports nutrition. Among the examined, elderberry juice would be the most effective choice, supporting their potential applications in functional and sports-related nutrition or dietary supplementation.



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sciforum-144002: Sustainable Nutrition Strategies for Rhythmic Gymnasts: Balancing Performance, Health, and Early Prediction of Anorexia Risk

Vincenzo Maria Romeo

Department of Culture and Society

Background

Rhythmic gymnastics demands high technical precision, aesthetic standards, and optimal body composition—factors that increase vulnerability to restrictive eating patterns. Implementing sustainable diets in this context requires ensuring peak performance while addressing psychological risk factors, particularly the early predictors of anorexia nervosa.

Objective

To evaluate the impact of a sustainable, performance-oriented nutrition program combined with predictive screening for anorexia risk in competitive rhythmic gymnasts.

Methods

Twenty-eight elite and pre-elite rhythmic gymnasts (mean age 17.8 ± 2.3 years) underwent a 12-week intervention integrating plant-forward, seasonally sourced diets with optimized macronutrient timing and micronutrient adequacy. Psychological risk was assessed using the Eating Disorder Inventory-3 (Drive for Thinness and Body Dissatisfaction subscales) and the SCOFF questionnaire at baseline and post-intervention. Performance outcomes included flexibility, balance, and aerobic endurance tests; dietary sustainability was assessed via estimated GHG emissions and water footprint.

Results

The program maintained or improved technical performance (flexibility +5.4%, aerobic endurance +4.9%) while reducing average predicted anorexia risk scores by 18% ($p0.05$). Environmental indicators showed a 24% reduction in GHG emissions and 20% lower water footprint without nutrient deficits.

Conclusions

Sustainable nutrition plans, when combined with early predictive screening for anorexia risk, can preserve performance and enhance mental well-being in rhythmic gymnasts. This approach supports both athlete health and environmental responsibility, providing a replicable model for aesthetic sports.



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sciforum-143751: The Human Heat Engine: A Clinical Validation Study for Predicting Weight Loss

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Introduction

The recently validated *Guide Against Age Related Disease* (GARD) dietary screener quantifies diet and behavior using Assembly Theory. It has shown strong correlations with known dietary patterns. However, its predictive utility in active populations remains untested. We propose a computer model that integrates GARD scores with a novel *Safety and Reciprocity Quotient* (SRQ)—a proxy for perceived life stress and environmental threats—to explain variability in weight loss and recovery under a consistent caloric deficit for patients trying to lose weight.

Methods

In a retrospective chart review, we plan to validate the model by evaluating patients enrolled in a diet and exercise program. Diet will be measured using the GARD screener (validated in Nutrients, 2025), and psychological safety will be estimated using the SRQ, derived from Adverse Childhood Event (ACE) scores, social determinants, and the Holmes-Rahe stress inventory. Our thermodynamic computer model treats the body as a heat engine with energy flows allocated first to basal metabolism, then to somatic activity (exercise), then healing vs storage. High SRQ scores will bias energy flow to storage over healing and recovery.

Results

We hypothesize that patients with high GARD scores and low SRQ will exhibit persistent weight loss and exercise habits, while those with low GARD or high SRQ will exercise less frequently and show plateauing weight loss despite caloric restriction. We expect the combined GARD–SRQ model to outperform caloric balance models in predicting longitudinal weight changes and recovery.

Conclusions

This study aims to validate the Human Heat Engine, a predictor of metabolic resilience and weight trajectory combining dietary measurement with stress metrics. Our findings may support a shift toward personalized interventions in metabolic health and exercise recovery.



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sciforum-150239: Association between severity of anxiety and dietary patterns among university students

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Introduction and objective

Evidence for the importance of nutrition for mental health is growing, yet the relationship between diet and anxiety is still less explored. The aim of this study was to assess an association between severity of anxiety and dietary patterns among university students.

Methods

The cross-sectional study was conducted in 304 Polish university students aged 18-26 years (74% females). Severity of anxiety was assessed with a subscale of the Depression Anxiety Stress Scale (DASS-21) including 7 items, and evaluated in 3 categories: normal (0-3 points; reference group), mild/moderate (4-7 points), severe (8-21 points). Dietary data were collected with the validated 72-item semi-quantitative food frequency questionnaire (72-item SQ-FFQ). Three dietary patterns (DPs) were derived using Principal Component Analysis (PCA): Prudent, Western, Traditional, and analysed in tertiles. Association between analysed variables was assessed using Spearman's correlation coefficient and logistic regression analysis. ORs were adjusted for sex, age, and BMI.

Results

Anxiety level was mild/moderate in 30.3% and severe in 38.2% of the university students. Severity of anxiety was negatively correlated with Prudent DP ($r = -0.17$, $p = 0.003$), and positively correlated with Western DP ($r = 0.24$, $p = 0.001$). Students with higher anxiety levels were significantly less likely to adhere to upper tertile of Prudent DP (mild/moderate anxiety: OR = 0.32, 95% CI = 0.15-0.69; severe anxiety: OR = 0.44, 95% CI = 0.21-0.90). Students with severe level of anxiety were significantly more likely to adhere to Western DP (middle tertile: OR = 2.76, 95% CI = 1.33-5.76; upper tertile: OR = 4.21, 95% CI = 1.95-9.12) compared to those with normal level of anxiety. No significant association was observed between severity of anxiety and adherence to the Traditional DP.

Conclusions

Severity of anxiety was negatively associated with pro-healthy dietary pattern, and positively associated with western dietary pattern. Higher anxiety can lead to unhealthy eating behaviours among university students.



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sciforum-136468: Consumption of sugary and energy drinks by children and its association with physical activity

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Introduction

In recent years, shifts in children's lifestyle habits have adversely affected their health, particularly through rising obesity rates and increased consumption of sugar-sweetened and energy drinks. These dietary patterns often correlate with sedentary behaviors and reduced physical activity. This study aimed to examine the consumption of sugary and energy drinks among children and its association with participation in sports.

Method

A cross-sectional study was conducted involving primary school children from educational centers in Pontevedra, Spain. An ad hoc online questionnaire was developed to collect sociodemographic data and assess key variables related to the consumption of energy and sugar-sweetened drinks.

Results

A total of 94 children participated (aged 8–12 years; 52.1% boys). Consumption of soft and energy drinks during sports activities was generally low. However, 31% of children reported consuming soft drinks during leisure time. Regarding sports drinks, 16% consumed them during leisure time and 11.7% during physical activity. The main reasons cited for consuming these beverages during sports included enhancing strength (18.1%), maintaining maximum intensity (17.0%), and supporting aerobic endurance (12.8%).

Conclusion

Children were more likely to consume sugary and energy drinks during leisure time than during sports practice. Despite relatively low intake during physical activity, some children believed these drinks improved physical performance. These findings underscore the importance of early educational interventions to dispel misconceptions and encourage healthier hydration habits.



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sciforum-144136: Correlating the Guide Against Age-Related Disease (GARD) Score with Clinical Biomarkers and Patient Outcomes: A Matched Cohort Study in the Context of Sustainable Diets and Sports Health

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Introduction

The Guide Against Age-Related Disease (GARD) Screener quantifies dietary complexity and food behaviors, offering a bias-mitigating approach to nutritional assessment. The original *Diet to Data* study validated GARD's accuracy, yet its relationship to health-related biomarkers and functional recovery in active populations remains unexplored. Sustainable sports performance requires not only acute fueling strategies but also long-term dietary patterns that support metabolic resilience and overall health. We hypothesize that the GARD score correlates with key metabolic and health indicators relevant to sustainable performance, including glycemic control, kidney function, and chronic disease burden.

Methods

A digital version of the GARD screener will be administered to a population of adult patients at a family medicine clinic, including recreationally active individuals. Participants will be matched for age and gender to form comparable high- versus low-GARD cohorts. Electronic health record (EHR) data will be extracted for hemoglobin A1c, body mass index (BMI), estimated glomerular filtration rate (eGFR), and number of chronic conditions (hypertension, diabetes, obesity, cancer, chronic kidney disease, depression, and anxiety). Statistical analyses will assess associations between GARD score and these outcomes.

Results

We anticipate higher GARD scores to correlate with lower BMI, improved biomarker profiles, and fewer chronic conditions, suggesting enhanced capacity for sustained activity and reduced long-term health risk. Conversely, lower GARD scores are expected to be associated with metabolic risk factors that may hinder recovery and performance sustainability.

Conclusions

This study will be the first to link GARD scores with real-world clinical biomarkers in a matched population, offering insights into how dietary complexity may contribute to both long-term health and sustained sports participation. If validated, GARD could serve as a practical, scalable tool to guide dietary strategies that balance performance and health in athletic and active populations.



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sciforum-147876: Determining the Potential of Millet –Rich Whole Wheat Mushroom Biscuit as a Nutraceuticals Intervention for enhanced cardiovascular health and Metabolic Disorders in athletes

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Determining the Potential of Millet –Rich Whole Wheat Mushroom Biscuit as a Nutraceuticals Intervention for enhanced cardiovascular health and Metabolic Disorders in athletes

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Introduction

This study investigated the potential of mushroom millet biscuits as a functional food product with a specific focus on applications within sports nutrition, particularly for athletes managing or seeking to prevent cardiovascular disorders. Rich in millets, protein, healthy fats, complex carbohydrates, and micronutrients, they support metabolic health—aiding in diabetes prevention and management—while combating under nutrition. Ideal for athletes and health-conscious consumers seeking convenient, whole-food-based nutrition. The primary objective was to enhance the nutritional profile of these common carbohydrates to better serve athletic needs. Edible mushrooms are a rich source of ergothioneine—a unique, potent antioxidant—dietary fiber (like beta-glucans), and high-quality protein. For athletes, this nutritional profile translates to direct benefits in **Cardiovascular Support and Sustained Energy & Body Composition**.

Methods

The mushroom powder was created by hot-air drying, grinding, and sieving and then added to the wheat-based biscuits. Nutritional analysis and sensory evaluations were used to assess composition and consumer approval.

Results

Products supplemented with mushrooms exhibited noticeably higher levels of protein, fiber, and antioxidants (such as ergothioneine and beta-glucans). Sensorily, a rate of 15–20% assimilation was adequate. Improved cardiovascular health, decreased inflammation, prolonged energy release, and increased satiety are some of the main advantages.

Conclusions

Mushroom powder is an effective functional ingredient for nutritional fortification. The resulting biscuit is a convenient, palatable food that supports both athletic performance and long-term cardio metabolic health.

Keywords: Mushroom Biscuits, Nutritional fortification, Nutraceuticals, Sports nutrition, Athletes, Cardiovascular health



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sciforum-150243: Dietary And Health Aspects In Men Exceeding The Recommended Doses Of Dietary Supplements: A Cross-Sectional Study

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Background

Adult men increasingly engage in training to enhance performance and muscle hypertrophy, accompanied by rising dietary supplements use. Aim: To analyse the association between diet, nutritional status and exercise capacity men with recreational physical activity exceeding (eDS) and not exceeding the recommended doses of dietary supplements use (non-eDS).

Methods

The study involved 170 men with recreational physical activity, aged 19-40. Data were collected on men's lifestyle, type and amount of dietary supplements used. Diet quality was determined using two predefined diet quality scores: pro-healthy diet index (pHDI) and non-healthy diet index (nHDI) based on data collected with the food frequency questionnaire (KomPAN®). The energy and nutritional value of the diet was determined by 3-day food record. Body composition, maximum oxygen consumption (VO₂max) in the spiroergometric exercise test with exhaust gas analysis. Blood levels of 33 nutritional markers were assessed against age-specific reference values.

Results

Dietary supplements were used by 69% of men (n=117), 10% of whom declared exceeding the recommended dose. The diets of men eDS (n=12) compared to men non-eDS (n=105) had a higher average content of 6 nutrients (by 21-62%) out of 31: eicosapentaenoic acid, docosahexaenoic acid, cholesterol, vitamins D, B12, B2. Between men eDS and non-eDS, there were no differences in: pHDI (mean±standard deviation: 29.15±11.60 vs 27.40±16.90 points, respectively), nHDI (16.75±14.50 vs 15.36±11.07 points), the frequency of consumption of 23 out of 24 food groups, BMI (26.0±2.9 vs. 25.0±2.6 kg/m²), waist-to-hip ratio (0.48±0.05 vs. 0.48±0.04), body fat content (17.1±6.8 vs. 18.5±5.5 %body mass), and VO₂max (46.9±8.7 vs. 44.4±8.3 ml/kg/min) and in mean blood nutrient markers, except for testosterone distribution above 8,000 ng/ml (by 37%; p=0.004).

Conclusions

Exceeding the recommended doses of dietary supplements by men engaging in recreational physical activity was not associated with any benefits for their nutritional status and exercise capacity, therefore it was unjustified.



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sciforum-149395: Effect of Transglutaminase on the Textural and Sensory Attributes of Pea Pod Protein Concentrate–Based Patty: A Sustainable Protein Alternative for Sports Nutrition

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Plant-protein-based foods have gained considerable attention based on ethical, environmental, and health concerns, facilitating the development of sustainable protein options for use in place of animal-source foods. The present research emphasizes the development of a sustainable, plant-protein-based patty from pea pod protein concentrate (PPPC), wheat gluten, and jackfruit as the major ingredients for a nutritionally dense food product with applications in sports nutrition. In order to improve texture and structure, transglutaminase enzyme was used at different concentrations (0, 0.1, 0.3, 0.5, and 0.7%). The best formulation (T4: 40% PPPC, 20% wheat gluten, 40% jackfruit, with 0.7% transglutaminase) had a protein content of 47%, whereas the control commercial chicken patty had 20%. Textural analysis revealed that T4 possessed hardness 2375.69, springiness 0.87, cohesiveness 0.74, gumminess 1260.4 g, and chewiness 1160.40 g, whereas the commercial chicken patty having hardness 2345.98 g, springiness 0.85, cohesiveness 0.77, gumminess 1263.44 g, and chewiness 1189.77 g, revealing that T4 closely replicates the textural characteristics of chicken patties. Sensory evaluation proved its high acceptability with scores higher than 7 on the hedonic scale for all the attributes. This plant-based patty can serve as a sustainable substitute for chicken patties with high protein from plant sources to aid in energy, recovery, and satiety for athletes while improving sports nutrition and encouraging environmentally conscious practices. The research emphasizes the potential of valorization of pea pods towards the development of protein-enriched, sustainable functional foods to aid in athletic performance and sustainable consumption.



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sciforum-149430: Effects of a maternal diet rich in fiber and polyphenols on the lipid metabolism of the mothers and their offspring at early and later in life

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Introduction

Maternal nutrition during gestation and early life is a key driver of fetal programming, with long-lasting effects on the offspring metabolic health. In the context of the growing obesity epidemic, diets rich in fiber and polyphenols have shown beneficial effects due to their anti-inflammatory, antioxidant, and lipid-regulating properties. Little is known about their influence during the perinatal period, especially in the absence of a high-fat challenge. The objective of this study is to evaluate the impact of a maternal diet enriched in fiber and polyphenols, administered during different perinatal stages, on the lipid metabolism of Wistar rat dams and their offspring at weaning and adulthood.

Methods

Two diets were used: a control diet and the intervention diet enriched with fiber and polyphenols. Plasma lipid profiles were characterized to identify diet-induced alterations. Morphological changes in white and brown adipose tissues were assessed. Moreover, the expression of key genes involved in lipid metabolism were quantified in the adipose tissues.

Results

Results showed no significant differences in total plasma lipid content between dietary groups. However, specific changes were observed in certain lipid species and minor subclasses such as altered bile acid profiles in dams following the intervention diet. In their offspring, a higher relative proportions of the hydroxylated fatty acids and a lower ratio of omega-6/omega-3 fatty acid ratio and reduced total cholesterol and LDL concentrations were detected compared to the control group. The intervention diet only influenced the brown adipose tissue morphology in the offspring at weaning. Gene expression analysis revealed some modifications primarily in the mothers, with changes persisting in the adult offspring.

Conclusions

These findings indicate that maternal intake of fiber and polyphenols can have some influence on the lipid metabolism of the mothers and their offspring, highlighting the potential of early nutritional strategies in shaping metabolic health.



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sciforum-147883: The Digital Diet Literacy Paradox: Why Highly Educated, Active Adults Still Fall Behind

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Introduction

Digital healthy diet literacy (DHDL) is essential for translating online nutrition information into effective dietary behaviors. This study examines determinants of DHDL among highly educated, physically active adults, revealing gaps in knowledge application despite academic and lifestyle advantages.

Methods

A cross-sectional study included 200 gym members (mean age 30.4 ± 7.1 years; 65% men) with university-level or higher education. Demographic and lifestyle data were collected. DHDL was measured using a validated scale. Participants were dichotomized into low (median) and high ($\geq$ median) DHDL groups. Logistic regression assessed associations with age, gender, education level (university vs. postgraduate), marital status, exercise frequency, and body mass index (BMI). Analyses were conducted in SPSS.

Results

Participants exercised an average of 3.7 ± 1.3 days per week, had a mean BMI of 25.5 ± 3.5 kg/m², and mean DHDL score 25.0 ± 13.3 . Fifty-eight percent of participants reported difficulty finding reliable online diet information, 45.5% had trouble understanding the recommendations, 54.5% struggled to assess their relevance, and 48.5% used online resources to improve their daily eating. Over half (55%) scored below the median, indicating low DHDL despite high education and regular exercise. Participants in the at-risk BMI category (≥ 25) were 2.27 times more likely to have high DHDL than those with healthy BMI (95% CI: 1.19–4.32; $p=0.01$), suggesting that higher BMI individuals actively engage more with digital diet information to manage or reduce weight. Other variables were not significant.

Conclusions

Despite high education and regular exercise, digital diet literacy remains suboptimal in this population. Higher BMI individuals appear to compensate by engaging more actively with online diet resources. Targeted, structured digital nutrition education within fitness environments may help bridge this gap and enhance the translation of knowledge into healthier eating practices.



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sciforum-146089: The Ergogenic Potential of Date-Palm Syrup in Athletic Performance

Lamia Seddiki

University Tahri Mohamed

Date-palm syrup, a traditional sweetener produced by concentrating the aqueous extract of date-palm fruit from the *Phoenix dactylifera* tree, is emerging as a potent functional food with significant applications in sports nutrition. Throughout, the unique nutritional composition of the date palm syrup aligns precisely with the elevated metabolic demands of athletes. Its importance is rooted in its dual role as a premier source of readily available energy and a rich repository of essential micronutrients. The syrup's carbohydrate profile, dominated by simple sugars such as glucose and fructose, facilitates rapid digestion and absorption, providing an efficient metabolic substrate to fuel high-intensity muscular work and sustain cognitive function during prolonged exertion. Beyond its macronutrient value, date-palm syrup is notably dense in critical electrolytes and minerals, including potassium, which is vital for nerve conduction; magnesium, which is a cofactor for energy production and muscle contraction; and calcium, which is essential for bone integrity. This inherent electrolyte content, often absent in refined sugars and artificially added in commercial sports drinks, positions date-palm syrup as a holistic nutritional resource. Furthermore, its complement of antioxidants, such as phenolic compounds, offers a protective benefit by helping to mitigate exercise-induced oxidative stress. For the athlete, this translates into a multifaceted nutritional tool. It serves as an effective ergogenic intake for pre-workout fueling, an intra-workout hydrating energy source to maintain performance and delay fatigue, and a powerful recovery agent to swiftly replenish glycogen stores and aid muscular repair post-exertion. As an energetic beverage, it constitutes a natural and highly effective alternative to processed sports drinks, delivering the essential triad of hydration, bioavailable carbohydrates, and electrolytes without artificial additives.

In conclusion, date-palm syrup transcends its role as a mere sweetener; it is a comprehensive, natural nutritional strategy for enhancing athletic performance, supporting rigorous training adaptations, and accelerating recovery.



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sciforum-144115: The Impact of Caffeine-Related Genetic Variants on Power and Endurance Performance in Athletes: A Personalized Nutrigenetic Approach

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Introduction

Caffeine is a common ergogenic aid in both power and endurance sports, yet its performance effects vary widely among individuals, largely due to genetic differences. *CYP1A2* and *ADORA2A* influence caffeine metabolism rate and central nervous system responsiveness, while *ACTN3*, *AMPD1*, *ADRB2*, *AGTR2*, *HFE*, and *NOS3* affect power and endurance capacities. This case report evaluates an athlete's caffeine-related genetic profile alongside their power and endurance potential to develop personalized nutrition and training recommendations.

Methods

An anonymized genetic panel from a male athlete, obtained through an Epigenetic Coaching test, was analyzed. The participant provided informed consent for the anonymized use of his data in research. Genotypes related to caffeine metabolism (*CYP1A2*, *ADORA2A*), power (*ACTN3*, *AMPD1*, *ADRB2*), and endurance (*AGTR2*, *HFE*, *NOS3*) were assessed and compared with performance-related polymorphisms in the literature to create individualized strategies.

Results

The athlete showed intermediate caffeine metabolism (*CYP1A2* AC) and low performance-enhancement response (*ADORA2A* CC), suggesting limited ergogenic benefit and possible adverse effects with high caffeine intake. Power genotypes *ACTN3* CT and *AMPD1* CC indicated moderate fast-twitch fiber activity and anaerobic capacity, while *ADRB2* GG supported explosive power potential. Endurance genotypes *AGTR2* CC and *HFE* CG were linked to advantages in oxygen transport and aerobic efficiency, though *NOS3* CT limited elite-level endurance potential. The recommended plan included high-intensity strength training 2–3 times per week, moderate-intensity endurance training 3–4 times per week, and limiting caffeine intake to 3 mg/kg at least two hours pre-exercise.

Conclusion

Assessing caffeine-related genetic variants alongside power and endurance profiles is useful for determining optimal ergogenic support and training strategies. A nutrigenetic-based personalized approach can enhance performance while minimizing adverse effects.



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Session 6. Microbiota and Sports Nutrition: The gut-Performance Connection

sciforum-145613: A Multi-Omics Approach to Investigating the Role of Fecal miRNAs in the Gut Microbiota Response to Physical Exercise: A Pilot Study

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Introduction

Regular physical activity improves overall health and reduces the risk of non-communicable diseases. These benefits have been linked to positive shifts in gut microbiota composition; however, the molecular mechanisms driving these adaptations remain unclear. Fecal microRNAs (miRNAs) may serve as mediators connecting exercise, inflammation, and microbial regulation.

Objective

This pilot study aimed to evaluate the effects of physical exercise on fecal miRNA expression and explore its relationship with gut microbiota composition and inflammatory profiles.

Methods

A total of 27 healthy adults (aged 20–45) were recruited and classified according to their physical activity level: trained individuals (≥ 3 sessions/week, 60–90 min, moderate–high intensity). Participants were clustered by IL-6 and LPS plasma levels into three inflammatory profiles (low, moderate, high). From these, six trained subjects (two per cluster) were selected and compared with one sedentary participant (1 session/week). Fecal miRNAs were quantified using TaqMan Array Cards (ThermoFisher) assessing 386 miRNA, while gut microbiota composition was determined by 16S rRNA sequencing. Microbial associations with IL-6 and LPS were analyzed via MaAsLin2.

Results

The clustering approach identified three distinct inflammatory groups. *MaAsLin2* analysis showed that *Christensenellaceae R-7* group and *Lachnospiraceae NK4A136* group were positively associated with lower IL-6 and LPS levels, suggesting an anti-inflammatory microbial signature in trained individuals. Conversely, *Bifidobacterium*, *Collinsella*, and *Solobacterium* were negatively correlated with these markers. Exercise-modulated miRNAs, including hsa-miR-1-3p and hsa-miR-92a-3p, were related to cardiac function, angiogenesis, and endothelial regulation. The integration of miRNA and microbiota datasets is currently ongoing to identify shared mechanistic pathways.

Conclusions

These preliminary findings suggest that regular exercise modulates the expression of specific fecal miRNAs, potentially influencing host-microbiota interactions. Integration of demographic, inflammatory, microbiota, and transcriptomic data in larger cohorts is required to

further elucidate the mechanisms underlying the interplay between physical activity, fecal miRNAs, and gut microbial dynamics.



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sciforum-144761: Antibacterial and Antibiofilm Potentials of LAB-Derived Metabolites Against *Porphyromonas gingivalis*

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Introduction

Porphyromonas gingivalis is a primary pathogen implicated in the onset and progression of periodontal disease, primarily due to its ability to form resilient biofilms and express virulence factors that disrupt host immune responses. Conventional treatments, such as mechanical debridement and chemical antimicrobials, often face limitations including resistance development and cytotoxicity. Lactic acid bacteria (LAB) are known to produce bioactive metabolites with antimicrobial and anti-inflammatory properties, offering a promising alternative for oral health applications. This study aims to evaluate the inhibitory and antibiofilm activities of LAB-derived metabolites against *P. gingivalis*.

Methods

Selected LAB strains (*Lactiplantibacillus rhamnosus* SUK1 and *Lactiplantibacillus plantarum* T2), isolated from human milk and tempeh, were cultured anaerobically in MRS broth at 37°C for 48 hours. The resulting supernatants were centrifuged, filtered, and treated with NaOH, catalase, and proteinase K to obtain treated cell-free supernatants (TCFS). These were subsequently lyophilized to produce L-TCFS. Antibacterial efficacy was assessed using broth microdilution assays, while antibiofilm activity was evaluated using crystal violet staining.

Results

All TCFS and L-TCFS samples demonstrated significant inhibitory effects against *P. gingivalis*. Among them, L-TCFS from a mixture strain S2 at a concentration of 50 mg/ml exhibited the highest antibacterial activity, achieving an 80.15% reduction in bacterial growth. This sample outperformed individual strain treatments including T2 and SUK1. Additionally, L-TCFS samples effectively reduced biofilm formation, although 0.12% chlorhexidine remained the most potent agent in comparison.

Conclusion

LAB-derived metabolites, particularly L-TCFS from the mixture strain S2, exhibit strong antibacterial and antibiofilm activity against *P. gingivalis*. These findings suggest their potential as safer alternatives or adjunct therapies in the management of periodontal disease, contributing to the development of microbiome-friendly oral care solutions.



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sciforum-144127: Characterisation of the gut microbiota in elite female futsal players throughout the season

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Introduction

The gut microbiota consists of microorganisms inhabiting various body sites, playing essential roles in pathogen defense, digestion, vitamin synthesis, and immune regulation. In the gut, dominant phyla include Firmicutes, Bacteroidetes, Actinobacteria, Proteobacteria, and Verrucomicrobia. Exercise, especially endurance training, can modulate microbiota composition, increasing metabolites such as short-chain fatty acids (SCFA), which benefit metabolism and inflammation. This study aimed to assess gut microbiota composition in elite female futsal players across a competitive season.

Materials and Methods

A longitudinal descriptive observational study was conducted with 14 elite female futsal players. Quarterly, a food frequency questionnaire (CFA-95) and fecal samples were collected using self-sampling kits (Ubiome, inc. United States). Participants received sampling instructions and nutritional guidance to optimize diet and microbiota diversity. For each sample, the amplicons of the 16S rDNA region were individually barcoded and sequenced in multiplex mode on the NextSeq 500 platform, using 150 bp paired-end reads. Taxonomic classification was performed using reference cluster (99% similarity groups) against SILVA 138.1 database to determine relative abundances.

Results

Mean diversity index was 7.96 ± 0.46 , with a Firmicutes/Bacteroidetes ratio of 2.03 ± 0.079 . Relative abundances were: Actinobacteria 0.40 ± 5.63 , Proteobacteria 0.87 ± 1.57 , Lactobacillus 1.38 ± 5.02 . An increase in Verrucomicrobia and Proteobacteria was observed towards the season's end.

Discussion

The reduction in the Firmicutes/Bacteroidetes ratio may reflect a lower risk of obesity-related metabolic profiles. Higher Actinobacteria abundance is linked to improved immune function and reduced intestinal inflammation, potentially supporting sustained performance. Verrucomicrobia, notably *Akkermansia*, may enhance intestinal barrier protection. Lower Proteobacteria levels could indicate reduced susceptibility to inflammatory bowel diseases.

Conclusion

Elite female futsal players exhibited a stable less inflammation-prone microbial environment gut microbiota profile. This composition may optimize energy metabolism and immune modulation. Microbiota profiling could serve as a potential biomarker for intestinal health and athletic performance.



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sciforum-143631: Fatty acid-primed *S. boulardii* enhances obesity treatment by improving gut survival and microbiota

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The probiotic yeast *Saccharomyces boulardii* has demonstrated potential in obesity intervention, both as a standalone therapy and as a complementary strategy to exercise. Recent studies suggest that *S. boulardii* may enhance exercise-induced weight loss by improving metabolic efficiency and gut barrier function. Notably, clinical trials have shown that *S. boulardii* supplementation combined with aerobic exercise can significantly improve body composition parameters beyond exercise alone, likely through its modulation of exercise-induced gut microbiota alterations. However, its efficacy is often limited by low survival rates under gastrointestinal (GI) stress. In this study, we investigated whether exogenous fatty acid supplementation could augment *S. boulardii*'s GI tolerance and therapeutic effects. Pre-culturing *S. boulardii* with linoleic acid (LA) significantly increased its GI stress resistance from 47.1% to 60.4%. In obese mice, LA-pre-treated *S. boulardii* administration resulted in greater weight reduction compared to untreated yeast, mimicking the synergistic effects observed in exercise-probiotic combined therapies. Fecal microbiome analysis revealed that LA-pre-treated *S. boulardii* elevated the relative abundance of fungal yeast populations and beneficial bacterial genera (e.g., *Lactobacillus*, *Bifidobacterium*), suggesting improved probiotic survival and gut microbiota modulation. These findings demonstrate that fatty acid pre-treatment enhances *S. boulardii*'s anti-obesity effects by boosting its GI survivability and enriching probiotic microbiota, offering a novel strategy to optimize probiotic-based therapies for metabolic disorders, including those adjunct to exercise regimens.



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sciforum-149316: Gut Resistome in Athletes: Impact of Sports Nutrition on Antimicrobial Resistance Genes

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The gut microbiota plays a central role in host metabolism, immunity, and overall function and is therefore of value for studies in sports nutrition. However, aside from its beneficial functionalities, the gut also harbours a reservoir of antimicrobial resistance genes (ARGs), collectively referred to as the resistome. Athletes, due to their specialised eating patterns, routine supplement intake, and elite-level physical exercise, may exhibit distinct microbiota alterations that can influence ARG abundance and dissemination. This study examines the intersection of sports dietetics, gut microbiota patterns, and antimicrobial resistance, with an emphasis on the resistome as the missing link to athlete health and sports performance. High-protein, specialised diets, probiotics, and energy-enhancing nutraceuticals modulate gut microbial ecology, either favouring or disfavoring the carriage of ARGs. Advances in metagenomics and functional microbiomics indicate that exercise-induced enrichment of selected microbiota (e.g., *Prevotella* and *Akkermansia* species) may reshape the resistome landscape and influence infection susceptibility as well as antibiotic responsiveness. Furthermore, sport-specific stress factors, such as repeated minor infections, antibiotic use, and co-training settings, can enhance ARG transmission. Understanding the gut resistome in athletes not only enhances our understanding of microbiota–performance interactions but also underscores the importance of infection control, individualised sports nutrition, and pharmaceutical and biotechnological interventions. Modulating the gut resistome using functional foodstuffs, synbiotics, and probiotics, which are designed to act selectively on specific resistome constituents, holds promise for optimising performance while minimising the risk of antimicrobial resistance. Integrated microbiome-resistome surveillance in sports science can develop safer and more effective nutrition models for athletes.



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sciforum-130504: Optimizing Gut Microbiota for Enhanced Performance in Judoka: The Role of Nutrition and Training Strategies

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This study examines the intricate relationship between gut microbiota, sports nutrition, and training methodologies in judoka, highlighting how dietary interventions impact strength, endurance, and recovery. Given the sport's intense physical demands, maintaining optimal gut health is crucial for energy efficiency, metabolic stability, and immune resilience, all of which contribute to competitive performance.

A systematic review was conducted, analyzing peer-reviewed studies on microbiota composition, dietary strategies, and athletic performance. Key nutritional interventions include probiotic and prebiotic supplementation, macronutrient optimization, hydration management, and polyphenol intake. Research suggests that probiotics enhance nutrient absorption and digestion, supporting weight regulation, which is vital for judoka competing in weight-class divisions. Additionally, fiber and polyphenol-rich diets promote microbial diversity, contributing to anti-inflammatory effects and oxidative stress reduction, which aid post-training recovery.

Findings indicate that high-intensity training and plyometric exercises enhance anaerobic power, while microbiota composition influences energy utilization, improving explosive movements, grip strength, and stamina. A balanced intake of protein, healthy fats, and complex carbohydrates supports anaerobic and aerobic energy systems, ensuring effective performance during judo techniques like throws and holds. Moreover, electrolyte balance and hydration strategies play a critical role in maintaining gut microbiota homeostasis, reducing fatigue and enhancing training adaptation.

This research underscores the importance of individualized nutritional approaches tailored to judoka's training intensity and competitive goals. Future studies should explore personalized microbiota-based dietary plans to optimize recovery, endurance, and overall metabolic function. By strategically enhancing gut microbiota health, judoka can gain a physiological edge, improving athletic resilience and performance longevity through precise dietary modifications. Understanding microbiota's role in sports nutrition offers valuable insights for combat athletes aiming for peak efficiency in high-stakes competition.



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