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Effects of nutritional and ergogenic supplementation on physical performance in futsal players: a systematic review protocol

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ADMINISTRATIVE INFORMATION**Support** - No support.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202690090**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 September 2026 and was last updated on 21 September 2026.**INTRODUCTION**

Review question / Objective This systematic review aims to identify and synthesize the available evidence on the effects of nutritional and ergogenic supplementation on physical performance, physiological responses, fatigue and recovery in futsal players, and to establish, where sufficient homogeneous data are available, a meta-analysis of supplementation versus comparator for the identified outcomes.

P (Population): Futsal players of any sex, age and competitive level (recreational to elite), excluding 11-a-side (outdoor) football players.

I (Intervention): Any nutritional or ergogenic supplement (e.g., caffeine, creatine, beta-alanine, sodium bicarbonate, nitrate/beetroot juice, carbohydrate, protein/whey, taurine, citrulline, arginine, glycerol, BCAA, betaine, omega-3/fish oil, capsaicin, diosmin, probiotics/synbiotics, electrolytes, magnesium, vitamin D, zinc, honey,

curcumin/turmeric, piperine, polyphenols), administered acutely or chronically.

C (Comparison): Placebo, no supplementation, or a different supplementation protocol/dose.

O (Outcome): Physical performance (sprint time, jump height, change-of-direction/agility, reaction time, muscular power/strength, running biomechanics), physiological responses (heart rate, blood lactate, VO₂, uric acid), fatigue (RPE), and recovery-related markers (CK, DOMS).

S (Study design): Randomized controlled trials (parallel or crossover) and non-randomized/quasi-experimental studies with a comparator group.

Rationale Dietary supplementation has been extensively studied in 11-a-side soccer players, with systematic reviews and meta-analyses already available. However, no equivalent synthesis currently exists for futsal, despite its distinct physical and physiological demands (high-intensity intermittent efforts in a reduced space, frequent changes of direction and repeated sprints). This review addresses that specific evidence gap in

futsal, without extrapolating findings from 11-a-side football.

Condition being studied Nutritional and ergogenic supplementation and its effects on physical performance, physiological responses, fatigue and recovery in futsal players.

METHODS

Search strategy Keywords and synonyms for futsal (futsal, indoor soccer, indoor football, five-a-side football/soccer) were combined with AND to keywords and synonyms for nutritional/ergogenic supplementation (supplement, ergogenic, and specific substances including caffeine, creatine, beta-alanine, sodium bicarbonate, nitrate, carbohydrate, protein, taurine, citrulline, arginine, glycerol, BCAA, betaine, omega-3, capsaicin, diosmin, probiotics/synbiotics, electrolytes, magnesium, vitamin D, zinc, honey, curcumin/turmeric, piperine, and polyphenols). Terms were searched in title/abstract fields (or the Topic/thesaurus-equivalent field for each database) across PubMed/MEDLINE, Scopus, Web of Science Core Collection, SPORTDiscus, Rehabilitation & Sports Medicine Source and CINAHL Ultimate, with no date or language restriction, up to 21 September 2026.

Participant or population Futsal players of any sex, age and competitive level (recreational to elite), excluding 11-a-side (outdoor) football players.

Intervention Any nutritional or ergogenic supplement (e.g., caffeine, creatine, beta-alanine, sodium bicarbonate, nitrate/beetroot juice, carbohydrate, protein/whey, taurine, citrulline, arginine, glycerol, BCAA, betaine, omega-3/fish oil, capsaicin, diosmin, probiotics/synbiotics, electrolytes, magnesium, vitamin D, zinc, honey, curcumin/turmeric, piperine, polyphenols), administered acutely or chronically, before, during or after exercise/competition.

Comparator Placebo, no supplementation, or a different supplementation protocol/dose.

Study designs to be included Randomized controlled trials (parallel or crossover) and non-randomized/quasi-experimental studies with a comparator group (e.g., pre-test/post-test with control group).

Eligibility criteria Inclusion: futsal players (any sex, age, competitive level); use of one or more dietary/nutritional or ergogenic supplements as the

intervention; comparison with placebo, no supplementation, or another supplementation protocol/dose; at least one outcome related to physical performance, physiological response, fatigue or recovery; peer-reviewed original research articles published in English.

Exclusion: 11-a-side football or other sport populations; mixed-sport samples not reporting futsal data separately; interventions that are not dietary/nutritional/ergogenic supplements (e.g., photobiomodulation/laser therapy, cold water immersion, vibration therapy, stretching or warm-up protocols, training-load modifications, mechanical or electrical recovery devices); genetic, descriptive or observational studies with no supplementation intervention (e.g., dietary intake surveys, nutritional status assessments, genomic association studies); publications not in English; reviews, commentaries, editorials, letters, short communications, conference abstracts/papers, book chapters, theses/dissertations, and other non-original-research article types; full text not available.

Information sources Electronic databases PubMed/MEDLINE, Scopus, Web of Science Core Collection, SPORTDiscus, Rehabilitation & Sports Medicine Source and CINAHL Ultimate (the last three via EBSCOhost) were searched for relevant publications up to 21 September 2026. Reference lists of included studies will additionally be screened to identify further eligible articles.

Main outcome(s) Sprint time (linear and repeated-sprint ability), jump height (CMJ, SJ, drop jump), change-of-direction/agility time and reaction time, muscular power/strength, distance covered/running speed during a specific test or simulated match, running biomechanics (acceleration, stride length, step frequency).

Additional outcome(s) Physiological responses (heart rate, blood lactate, VO₂, muscle oxygenation, uric acid), perceived exertion/fatigue (RPE), recovery-related markers (creatine kinase, DOMS, reactive strength index recovery, CMJ recovery %), motor coordination and cognitive function, postural balance, hydration status/urinary electrolytes.

Data management Records exported from all databases will be imported into reference-management software (e.g., EndNote/Rayyan) for duplicate removal. Title/abstract and full-text screening will be performed independently by two reviewers, with disagreements resolved by discussion or a third reviewer. Data extraction will

follow a piloted standardized template (population, supplementation protocol, comparator, outcomes, main findings).

Quality assessment / Risk of bias analysis Risk of bias will be assessed independently by two reviewers, with disagreements resolved by consensus or a third reviewer. The Cochrane RoB 2 tool (parallel and/or crossover version as applicable) will be used for randomized trials, and the ROBINS-I tool for non-randomized/quasi-experimental studies with a comparator group.

Strategy of data synthesis Meta-analysis will be conducted for outcomes reported by a sufficient number of studies using comparable measures (threshold and effect model to be confirmed by the team e.g., random-effects model with standardized mean differences, given expected heterogeneity in exercise tests). A narrative synthesis will be provided for outcomes with insufficient data for pooling.

Subgroup analysis Planned subgroups: sex; competitive level; type of supplement; acute vs. chronic supplementation; study design (randomized vs. non-randomized/quasi-experimental).

Sensitivity analysis Exclusion of studies at high risk of bias; exclusion of non-randomized/quasi-experimental studies to test robustness of pooled estimates; publication-bias assessment (e.g., trim-and-fill) where enough studies are available for a given outcome.

Language restriction Language restriction: English.

Country(ies) involved Spain.

Keywords futsal; supplementation; ergogenic aids; physical performance; sports nutrition.

Contributions of each author

Author 1 - Jesús Siquier Coll - Led the project and performed the search and methodological design. Will jointly conduct title/abstract and full-text screening with Author 2 to ensure agreement between reviewers. Drafted the Methods, Introduction and Discussion sections of the manuscript.

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Author 2 - Carlos Galiano - Will jointly conduct title/abstract and full-text screening with Author 1 to ensure agreement between reviewers. Led the drafting and writing of the manuscript.

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