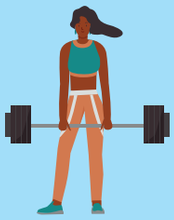
YOGURT IN NUTRITION
INITIATIVE FOR SUSTAINABLE AND BALANCED DIETS

YOGURT IN SPORTS NUTRITION

Engaging in sports activities comes with specific nutritional needs, and yogurt can be a valuable asset in meeting these requirements.

SPORTS PRACTICE IMPACTS NUTRITIONAL REQUIREMENTS



Regular sports practice leads to physiological adaptations. These changes can directly impact nutritional requirements, which may vary based on the frequency, duration, and intensity of physical activity [1,2,3].

Max HR

70%

50%

Max HR = Maximal Heart Rate (beats/mins)
(Theoretical max HR : 220-age)

Frequency	Duration	Intensity
Regularly (1/week min)	Long (over 1h30)	High (running, football, zumba)
Occasionally (1 to 2/month)	Medium (30 mins to 1h30)	Moderate (biking, swimming, volleyball)
Rarely (less 1/month)	Short (30 mins or less)	Low (walking, yoga)

Adaptation of nutritional intake

Effects of physical activity

Proteins
- Proteolysis
- Amino Acids (AA) oxidation

Lipids*
- Energy reserves
- Free fatty acids oxidation

*in case of prolonged effort

Water
- Dehydration
- Electrolytes (Na, Cl, K, Mg, Ca)

Carbohydrates
- Glycogen energy reserves

Micro-nutrients
- Metabolic pathways

Intakes must be adapted to optimize the nutrient effects on health, performance and recovery [1,2,3].

Before effort
- **Carbohydrates** → Energy source

During effort
- **Carbohydrates** → Energy source
- **Water** → Hydration and electrolytes

After effort
- **Water** → Hydration and electrolytes
- **Carbohydrates** → Replenishment of glycogen reserves (energy)
- **Proteins** (combination of slow and fast proteins) → Muscle regeneration and recovery, replenishment of glycogen reserves
- **Vit. A,B,C,E** → Antioxidants
- **Ca, Vit. D** → Maintain of muscle mass

YOGURT: A NUTRITIONAL ALLY FOR SPORTS PEOPLE

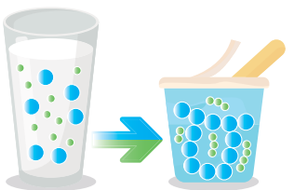
Yogurt provides vitamins, minerals, ferments and high-quality proteins, which are invaluable for muscle repair and maintenance [4,7,9]:

Vitamins and minerals*

- Calcium: 127 mg
- Phosphorus: 101 mg
- Vit. B9: 29 µg
- Vit. B12: 0,33 µg
- Vit. A: 48 µg

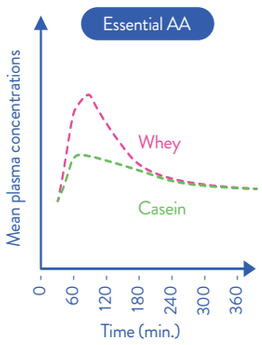
Specific ferments (10^8/g)

- **Benefits of fermentation**
  - Improvement of lactose digestion [8,18]
  - Ferments and fermentation metabolites
    - Possible positive effects on the microbiota balance and the skeletal muscle via the intestinal-muscle axis [5].
  - Fermented Dairy Matrix [5] = Semi-solid texture and protein organisation in an acidified gel:
    - Better absorption of dairy proteins.
    - Optimization of the intake of amino acids and skeletal muscle protein synthesis [5,6,7].



Proteins (3,8g/100g*)

- **High quality** (good digestibility, contain essential amino acids...)
- **80% of casein protein,** "slow protein" [5,6,10]:
  - Slower availability of AA
  - Long term effects (3-5h after ingestion)
  - 20% of the casein AA are BCAAs (leucine, valine and isoleucine)** [9,10]
- **20% of whey protein,** "fast protein" [5,6,10]:
  - Rapid assimilation of the BCAAs (muscle protein synthesis, muscle energy substrate)
  - 23% of the whey AA are BCAAs



Whey and casein show different absorption rates, showing a quicker circulating essential AA after whey ingestion compared to casein. It illustrates the notion of fast protein (for whey) vs. slow protein (for casein) and their differential use according to the benefit expected.

*Average values for 100g of plain yogurt, wholefat, USDA foodDatacentral [4]
** Branched Chain Amino Acid

Adapted to meet the specific nutritional needs of athletes

Vitamins & minerals → Functional contributions

- **Maintenance of muscle mass** (Calcium and vit. D)
- **Immunity** (Vit. A)
- **Cellular repair** (Vit. A, B2, B9, B12, C, E, trace elements)
- **Oxidative stress**

Proteins → Structural roles

- **Protein synthesis** in skeletal muscles
- **Cell renewal and growth**
- **Growth and maintenance of muscle mass**

Hydration

- **Water and mineral intake**

Carbohydrates

- **Replenishment of glycogen reserves**

Protein content varies according to recipe

Plain yogurt 3,8g/100g

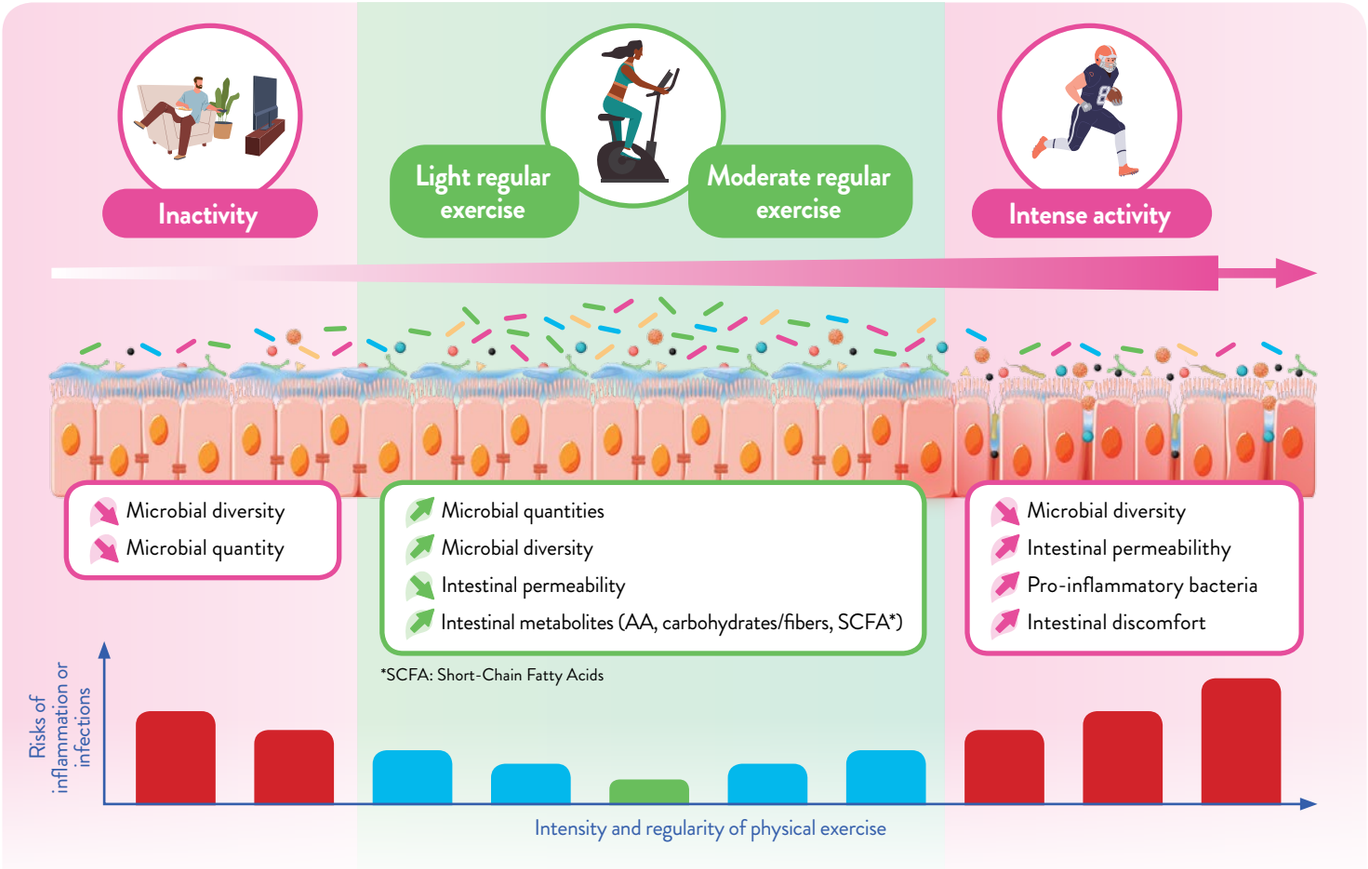
Greek Yogurt ~9g/100g

Skyr 8 to 10g/100g

Fermented dairy products offer a range of options for naturally supplying the required **amount of protein** [4].

FERMENTS FOR THE GUT BALANCE OF SPORTS PEOPLE

Studies show a link between sports practices and gut health [11-15].



Fermented dairy products may contain probiotics.

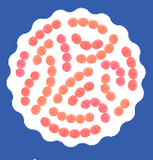
Some of these can affect performance parameters [11,17], in particular:

- Promote gut health and immune function.
- Facilitate digestion and nutrient absorption.
- Potentially reduce the risk of gastrointestinal upset during exercise [11].

Bifidobacterium

Lactobacillus (incl. L. bulgaricus)

Streptococcus (incl. S. thermophilus)



Lactococcus

Probiotics appear to act through the modification of [17]:

- Intestinal microbiota, through transient modification.
- Intestinal mucosa and permeability.
- Bacterial enzymatic capacity.
- Digestive capacity (digestion and absorption of dietary proteins).

Immunity

- Regulation of immune factors

Oxidative markers

- Antioxidant potential

Respiratory or gastro-intestinal infections:

- Duration of symptoms
- Intensity of symptoms
- Number of episodes

Performance

- Nutrients absorption
- Muscle tension
- Muscle Recovery
- Length of activity before fatigue

Strain-dependent effects

Example: Supplementation with **probiotic fermented milk** (*Bifidobacterium animalis ssp.*) contributes to reduce fatigue in female taekwondo athletes by helping to balance the microbiota and regulate certain metabolic pathways [16].

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To find out more about yogurt, visit: www.yogurtinnutrition.com

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