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INTEGRATING SUSTAINABILITY IN ATHLETES' DIETARY CHOICES

SUSTDIET

POLICY RECOMMENDATIONS FOR INTEGRATION OF SUSTAINABILITY INTO NATIONAL DIETARY GUIDELINES AND DEVELOPMENT OF DIETARY GUIDELINES FOR ATHLETES

KMGNE · A.N.C.E · MEHFA · Sport Evolution Alliance · Mathaino Diatrofi · Defoin

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Disclosure statement

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GENERAL POLICY RECOMMENDATIONS

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SUMMARY

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SUMMARY

1. INTRODUCTION

This document addresses two primary objectives:

1. Providing Creating sustainable dietary guidelines tailored for athletes
2. Producing recommendations towards integrating sustainability into National Dietary Guidelines (NDGs) for National Authorities.

In this context, the first part of this document is crafted through a set of unified recommendations with a transnational scope, which include the findings of PR1, secondary research, and reflection of the partner organizations on this project and other previous experiences. The second part provides a set of recommendations for national authorities that aim to integrate sustainable diet practices for athletes into their National Dietary Guidelines (NDGs). To that end, each partner country (Turkiye, Malta, Spain, Greece, Germany, and Portugal) adapted transnational insights according to their national context and drafted national-specific recommendations.

The main objective of the SustDiet project (2021-1-DE02-KA220-ADU-000033782), sponsored by the European Education and Culture Executive Agency (EACEA), is to facilitate the integration of sustainability in athletes' dietary choices in order to contribute to the F2F strategy which encourages sustainable food consumption. This booklet clarifies the importance of sustainable dietary preferences for athletes by offering essential insights and actionable suggestions. The project consortium, comprising Kolleg für Management und Gestaltung nachhaltiger Entwicklung gGmbH (KMGNE, Germany), Mathaino Diatrofi (Greece), Athens Network of Collaborating Experts (ANCE, Greece), Malta Exercise Health and Fitness Association (MEHFA, Malta), Sport Evolution Alliance (SEA, Portugal), Bolu provincial directorate of youth and sports (Turkiye), and DEFOIN (Spain), collaboratively worked on the development of this booklet. Before delving into a detaied discussion, it's important to provide a broad definition of sustainability, which the project consortium embraced but also found worldwide acceptance.

2. WHAT IS SUSTAINABILITY?

Sustainability is identified as the ability to exist and develop without depleting natural resources for the future; acquiring more sustainable choices will be beneficial in both the short- and long-term (TWI). In the last decades, the term sustainability has spread and gained importance in every sector of our society, economy, and environment. Indeed, thousands of political measures, speeches, company policies, and daily practices are directly or indirectly linked to the concept of sustainability. To have an insight about the historical development of the sustainability definition you can have a glance at our Sustainable Diet Guideline, developed for athletes.

A key strategy that has been adopted by many nations looking to incorporate sustainability principles in their food policies is the development of recommendations promoting specific dietary practices and their integration into Food-Based Dietary Guidelines (FBDGs). These dietary recommendations are often addressed to specific population groups with unique nutritional or other needs, such as people of different ages or with specific dietary restrictions. Athletes, a group with unique diets and nutritional requirements who exert great influence in the wider society, should not be exempt from such recommendations. To clarify this, you will find an outline of our Sustainable Diet Guideline, developed for athletes in section 4 and 5.

3. SUSTAINABLE DIETARY GUIDELINES TAILORED FOR ATHLETES

This chapter provides a comprehensive overview, beginning with the foundational understanding of sustainability, followed by insights into sustainable diets for athletes. Subsequently, this chapter takes a glance at some strategies to amplify sustainability in athletes' diets. Finally, it delves into the pivotal role of sports professionals. In this section, we will review some strategies prepared by the project consortium based on the relevant literature to enhance sustainability in athletes' dietary choices. Given that specific nutritional and higher energy needs, exploring strategies to elevate sustainability in athletes' dietary choices, which are rather differentiated from non-athletes, can positively contribute to climate change mitigation and adaptation.

Figure 1. United Nation (1987) Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

In the last decades, the term sustainability has spread and gained importance in every sector of our society, economy, and environment. Therefore, various definitions of the term exist. Sustainability, as defined by the Sustdiet consortium, incorporates ecological, social, and economic aspects. It seeks to prevent the depletion of natural or material resources so that they will remain available for the long term. Sustainability aims to improve the quality of human lives and protect planetary ecosystems. It includes the responsible use of natural resources to meet social and planetary boundaries and ensure an environmentally safe and socially just space for generations in all world regions today and in the future (Raworth, 2017). Therefore, it is a matter of doing justice to the task to meet "the needs of the present without compromising the ability of future generations to meet their own needs." (Imperatives, 1987). The World Resource Institute (2016) states that "we are what we eat, and what we eat has a profound impact on the planet", which underlines the importance of sustainable diets as a crucial part of sustainable development. Nutritional style does not only influence one's well-being and health but also has a manifold impact on the environment and society through its way of production and consumption. The basis of a sustainable diet is a socio-ecologically sustainable food system. Accordingly, sustainability must be ensured during production, processing, transport, marketing and retail, consumption, loss, waste and disposal. In addition, several drivers, more precisely factors, processes, and conditions that shape the availability, accessibility, affordability, and desirability of foods in a particular location must be taken into account. Fundamental transformations of our food system are necessary to ensure a sustainable and good nutrition for all.

In line with this, sustainable diets refer to food preferences based on low environmental pressure and impact, and fair trade to reduce greenhouse gas emissions from food systems (Food and Agriculture Organisation, 2019). Meyer et al. (2020) has identified five widely accepted steps essential for achieving such a sustainable diet: (1) Reduce Food Waste, (2) Avoid Unnecessary Packaging, (3) Reduce Processed, Frozen, and Canned Foods, (4) Limit Protein Supplements, and (5) Transition from Animal-based to Plant-based Foods. These steps can be further elaborated on, as illustrated in the visual below.

Figure 2. Adopted from EUFIC, Last Updated: 26 May 2023: https://www.eufic.org/en/food-production/article/practical- tips-for-a-healthy-and- sustainable-diet

3.1. What is a Sustainable Diet for Athletes?

Meyer et al. pointed out that athletes are widely perceived as role models by an extensive range of society, therefore, they could act as such in the field of sustainable nutrition, becoming change agents for climate action (Meyer & Reguant-Closa, 2017). One might assume that a sustainable diet for athletes involve merely integrating sustainability principles into their nutritional choices. However, such interventions require holistic and comprehensive approaches due to various factors that must be considered, such as potential concerns about decreasing their athletic performance. Furthermore, athletes have unique nutritional needs when compared to the non-athletic population, with different macro- and micronutrients, fluids, and energy recommendations aimed at improving performance (Kreider et al., 2010). Inherently, this unique need of athletes highly complicates the process of integrating sustainability into their daily dietary choices.

Consequently, the food choices of athletes, especially the higher protein intake, usually from animal-based sources (Philips et al., 2013; Lynch et al., 2018), have been under scrutiny for sustainability for a while now. In this sense, the International Olympic Committee (IOC) is committed to inspire its members, such as athletes, coaches, and national sports federations, to actively contribute to the planet's sustainable development [1]. However, it's worth asking the question which also served as the starting point for this project with Terzi and Ersoy's (2022) words: "Can a sustainable diet be sustainable for athletes?". This inquiry is sought out to be answered in the following section.

3.2 How Can Sustainability Be Increased in Athletes' Dietary Choices?

An optimal intake of energy, macro-, and micronutrients, and fluids is essential to good performance in all sports (Kreider et al., 2010). Notwithstanding, all recommendations vary depending on the type of sport, volume of training, body composition, hydration status, food allergies, or other special needs of the respective athletes. According to sports guidelines, for carbohydrates, Burke et al. (2011) consider intakes of at least 5 g/kg/d (for a moderate exercise program, such as 1h/d) for fuel and recovery, but these recommendations can increase to more than double during the competition phase (Burke et al., 2011). Fat intake should be between 20-35% of energy intake. Protein intake should be 1.2 – 2.1 g/kg/d (Thomas et al., 2016), but higher values are seen in strength/power training athletes and bodybuilders (Phillips, 2012).

For micronutrients, an adequate intake can enhance recovery and improve sports performance (Burke & Deakin, 2015). Athletes should consume at least the Dietary Reference Intake (DRI) because of the wide safety margins for nutrient recommendations (Rodriguez et al., 2009). Requirements of micronutrients, particularly sodium, B6, and iron, may depend on the levels of physical activity (Whiting & Barabash, 2006), but further research is needed on this topic.

Besides that, the Dietary Reference Intake (DRI) for micronutrients seems to be appropriate for most athletes (Thomas et al., 2016), except for iron, which is 1.3 – 1.7 times higher for athletes (Institute of Medicine (US) Committee to Review Dietary Reference Intakes for Vitamin D and Calcium; Ross AC). For those who restrict energy intake to achieve weight loss or restrict a specific group of foods, more attention to micronutrient adequacy is required because of the higher risk of deficiency.

Currently, a sustainable diet is defined as one that produces little environmental impact, is protective and respectful of biodiversity and ecosystems, and is nutritionally adequate, safe, healthy, culturally acceptable, and economically affordable (Agyemang et al., 2022). To achieve a more sustainable diet, athletes can use different predominantly plant-based dietary approaches as an orientation. In this recommendation, we look closer into the Planetary Health Diet and the Mediterranean Diet.

3.3 Planetary Health Diet

According to the EAT-Lancet Commission, the term "planetary health diet" is used to highlight the critical role that diets play in linking human health and environmental sustainability and the need to integrate these often-separate agendas into a shared global agenda for food system transformation to achieve the SDGs and Paris Agreement (Willett et al., 2019). The Planetary Health Diet is a flexitarian diet, which is largely plant-based but can optionally include modest amounts of fish, poultry, eggs, and dairy products, foods and occasionally red meat. The diet contains unsaturated rather than saturated fats and limited amounts of refined grains, highly processed foods, and added sugars. Nevertheless, local interpretation and adaptation of the universally applicable planetary health diet is necessary and should reflect the culture, geography, and demography of the population and individuals (Meyer et al., 2020; Swinburn et al., 2019; Willett et al., 2019).

Figure 3. Types of Foods in the Planetary Health Diet. The EAT-Lancet Commission on Food, Planet, Health, https://eatforum.org/eat-lancet-commission/the-planetary-health-diet- and-you/

Although such diets are consistent with many traditional eating patterns, it does not imply that the global population should eat the same food, nor does it describe an exact diet. Instead, it outlines empirical food groups and ranges of food intake, which, combined with a diet, would optimize human health (For more details please see our Susdiet Guideline).

3.4 Mediterranean Diet

This dietary pattern, resembling the traditional eating habits of people from the Mediterranean area during the 1960s, is characterised by a low intake of red meat and processed meats, a moderate intake of fish, poultry, eggs, and dairy, and a high intake of olive oil, non-refined cereals, legumes, vegetables, fruits and nuts (Griffiths et al., 2022; Martinez-Lacoba et al., 2018).

While close adherence to the Mediterranean Diet makes the risk of nutritional deficiencies extremely low, it also offers multiple possibilities of modulation and customisation according to the individual needs and to comply with specific sport nutrition recommendations. Furthermore, the transferability of the traditional Mediterranean Diet pattern to non- Mediterranean populations is also possible due to its nutritional adequacy, palatability, potential for health and sustainability.

In 2010, the new Mediterranean Diet Pyramid was developed to represent "a lifestyle of today" with the following dietary consumption recommendations (see figure 32 below). The new pyramid is not just about prioritising some food groups over others but also paying attention to the way of selecting, cooking and eating to acquire all the benefits offered by the Mediterranean diet, specifically moderation, socialisation, cooking, seasonality, biodiversity, eco-friendliness, traditional and local food products, physical activity and rest (Bach-Faig et al., 2011; Martinez-Lacoba et al., 2018).

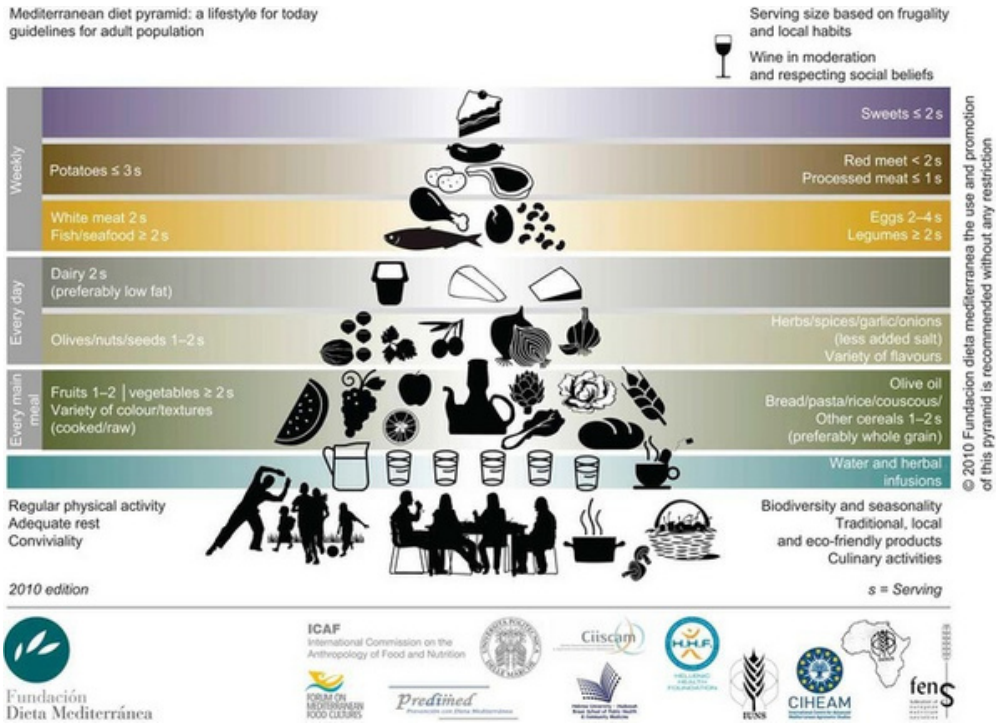

Figure 4. Mediterranean Diet Pyramid dietary recommendations (Bach-Faig et al., 2011)

Regarding athletes, the available evidence suggests that this nutrition model is feasible as a healthy dietary pattern in sports nutrition .

4. ADVANCING SUSTAINABILITY IN THE SPORTS REALM

Given the potential role that athletes' demands and sustainability awareness can play in driving the food industry towards greater sustainability, we outline key observations below, stemming from literature and the insights gained from our project:

1 - While an adequate intake of micronutrients can facilitate the recovery process and improve athletic performance (Burke & Deakin, 2015), it is important to note that athletes, particularly those dealing with injuries or seeking to boost performance, should avoid excessive micronutrient consumption, as advised by recent systematic reviews (Ghazzawi et al., 2023). This is important because the overuse of micronutrient consumption is not eco-friendly.

2 - There is lingering belief and practice to favour higher protein intakes for active and athletic individuals, with some studies showing excessive intakes as high as 4.3 g/kg/day (Meyer & Reguant-Closa, 2017) although that leads to a decrease in another macronutrient intake, typically carbohydrates (Phillips, 2014). As such, one of the important steps toward sustainability for athletes should involve a careful assessment of the total amount of protein intake, its quality, and its distribution frequency (Burke et al., 2019; Jenner et al., 2019a; Meyer et al., 2020). In other words, the more ensuring the avoidance of overconsumption of protein intake the more environmental sustainability.

3 - As suggested by Meyer & Reguant-Closa (2017), well-designed and sustainable training is required for athletes, which should include topics such as food waste, learning to devise weekly meal plans, compile precise shopping lists, and effectively store leftovers.

4 - According to the literature, animal-based protein sources included in common diets have a significantly higher environmental impact than plant-based alternatives (Meyer & Reguant-Closa, 2017). On the other hand, regarding athletic performance, a significant amount of research finds no significant differences in strength, and aerobic or anaerobic capabilities between omnivorous athletes and those adhering to plant-based diets, including vegan or vegetarian regimes. Furthermore, numerous athletes who adopt plant-based diets have high levels of performance in their respective sports (Burke et al., 2019; Jenner et al., 2021b). Moreover, with the increase of plant-based sources, it is expected that the intake of fruits and vegetables, which are associated with vasodilatory, antioxidant, and anti-inflammatory properties, will also increase, which can lead to improved blood flow, reduced oxidative stress, and inflammation, thus, reduced muscle damage (Lynch et al., 2018; Meyer & Reguant-Closa, 2017; Meyer et al., 2020).

5 - Athletes tend to consume protein-enriched supplements, particularly animal-based ones, to strengthen muscle building, and adaptation, and accelerate the recovery process from injury (Jovanov et al., 2019). While convenient, using protein supplements may lead to excessive protein consumption (Nunes et al., 2018). Therefore, athletes should favour a whole food-centered diet that is rich in fiber and nutrients while minimizing the excessive intake of supplements (Jenner et al. 2019b: Westberg et al. 2022). Additionally, the preference for plant-based supplements can contribute to environmental sustainability.

6 - Athletes should be encouraged to adopt sustainable habits regarding their daily dietary choices such as investing in reusable water bottles, buying foods in recyclable packaging, reducing the use of straws, preferring home-prepared meals rather than snacks on the go, preferring fresh, seasonal, and locally grown foods, and reducing food waste (Willett et al., 2019). In this context, our Sustainable Diet Guideline draws attention to the importance of "Sustainable shopping & and consuming: choosing seasonal & and locally grown fresh food; limiting food waste" For instance, seasonal and fresh food consumption is generally more environmentally favourable (Calella et al., 2022). Similarly, food waste is another significant trait of sustainable habits because people globally waste 1 billion tonnes of food annually, as reported by the United Nations Environment Programme's (UNEP's) Food Waste Index Report 2021.

7 - It is vital to deepen our understanding of how dietary behaviour changes influence various population groups, particularly athletes (Hallström et al., 2015). Athletes may develop problematic eating behaviours due to their complex relationship with food, requiring multifaceted approaches to change such behaviours (Bentley et al. 2015). In this context, several systematic reviews reveal that nutrition education interventions (Boidin et al., 2021), the knowledge of athletes about nutrition (Janiczak et al., 2023), performance loss concerns (For more details please see our Susdiet Guideline), and social factors like diet patterns, availability, community pressure and marketing (Birkenhead & Slater, 2015) play a pivotal role in athletes' dietary changes. Furthermore, it is crucial to develop new skills regarding food selection, shopping, meal planning, cooking, food safety and storage (Calella et al., 2022; Westberg et al., 2022).

8 - Flexitarian diets predominantly consist of vegetarian or vegan meals, yet they occasionally allow the consumption of meat, fish, or dairy. This adaptable dietary pattern prioritises plant-based foods while respecting personal tastes and lifestyles. The emphasis of a flexitarian diet is on amplifying intake of nutrient-rich plant foods and curtailing animal products. The Mediterranean and Planetary Health diets, recognized as flexitarian diets, are aligned with sustainable eating practices (please see PR1 via https://www.sustdietproject.eu/).

4.1 The Role of Sports Professionals in Establishing Sustainable Diets for Athletes

Athletic success relies not solely on their talent, skills, and dedication but also on the support they receive, particularly from the human resources surrounding them. Coaches, as might be expected, are pivotal to an athlete's career and often become their role models, as noted by Arıpınar and Donuk (2011). More precisely, athletes develop their sportive worldviews through socialisation within the sports community, that is, learning from coaches, teammates, big names in their sports branch, and other sports professionals, as discussed by King et al. (2022). Having said that, this section focuses on two key roles within an athlete's environment, that is on coaches and sports nutritionists, both of whom are pivotal in shaping athletes' dietary choices and integrating sustainability principles in them.

Figure 5. An AI-generated depiction that portrays a futuristic or conceptual representation of athletes` sustainable diet practices.

4.1.1 The Role of Sports Nutritionists

As indicated by Ulutaş and Özgül (2020), sports nutritionists are significantly involved in athletes' stories in the contemporary sports world. They undertake personalised guidance roles in establishing the dietary patterns of athletes, from weight management strategies to performance optimization strategies, from preventing eating disorders to ensuring sufficient energy intake. Likewise, sports nutritionists will undoubtedly play a key role in making the dietary practices of athletes sustainable. Therefore, building upon the previous outcomes of our project (IO1 and IO2) and the report of the Dietitians of Canada Association (Carlsson et al., 2020), sports nutritionists should:

- be reflective on their own beliefs and perspectives on a sustainable diet to gain a deeper understanding of athletes' views and contexts.
- conduct research and reveal evidence related to sustainable diets for athletes (i.e., strategies to optimise their sports performance while becoming sustainable)
- provide reliable and verified knowledge and skills related to sustainable diets (i.e., informing about protein consumption and supplement usage, sustainable shopping and consuming, providing strategies for weight management when there is a need to lose weight to belong in a lower-weight category etc.)
- fight against myths and misinformation about the ingredients of foods, and their impact on sportive performance.
- promote a sustainable diet for athletes and support their dietary behaviour change by improving their relationship with food.
- involved in sustainable diet activities both inside and outside of the sports realm.
- work closely with food chains to enhance sustainable food supply for athletes.
- establish collaborations with coaches and various sports professionals to present a strong and unified voice for a sustainable diet for athletes.

- act as leverage in establishing a sustainable food culture among athletes on sports teams. For example: facilitate the process of reducing meat quantity and increasing legume quantity (considering the macronutrient adjustments) and/or implement plant-based alternatives such as soy, seitan, tofu, etc.)
- explore methods for integrating sustainability into athletes' diets, focusing on aspects like seasonal food preference and reducing food waste. This should involve both pre-consumption strategies, such as selecting local and seasonal foods, and post-consumption approaches, like efficient food waste management. The aim here is to establish tailored diet plans that align with sustainable practices.
- consider the possible barriers that athletes/sports teams might face while adopting the sustainable diet, such as the accessibility of sustainable foods and their cost, cultural dietary habits, travel for away games, and performance loss concerns.
- follow up on the sustainable diet activities embraced by athletes and the entire team (i.e., the amount of food waste reduction, control of the supplements usage and prioritising whole foods, assuring that athletes are not under a lower energy availability, avoiding eating disorders, the tendency on plant-based foods, the decrease in canned, packaged, or frozen food consumption)

4.1.2 The Role of Sports Coaches

When discussing nutrition, in addition to acknowledging the crucial role of sports nutritionists, however, coaches still play a vital and central role in this journey, as athletes often see them as role models (Jowett, 2017). This is because most beliefs and attitudes athletes possess are coloured by significant others such as coaches, teammates, and role models of the sport they perform (Dunn et al., 2001; King et al., 2022). Furthermore, the collaboration between coaches and nutritionists, who particularly specialise in athletes' diets, is crucial in integrating sustainability into athletes' dietary decisions.

However, this section will specifically focus on examining the role of coaches in aligning sustainable dietary practices with athletes' preferences. For instance, while sports nutritionists prescribe athletes daily diets, it is the coaches who are central to monitoring and managing the athletes' diets (Gullu, 2018). In other words, the effectiveness and applicability of sports nutritionists' diet recommendations largely depend on the level of importance and adherence coaches give to them.

- Coaches need to increase their awareness and knowledge of sports nutrition, particularly the integration of sustainability into athletes' dietary preferences (Jessri et al., 2010; Cockburn et al., 2014; Aka, 2020).
- Coaches can start adopting sustainable diet practices themselves to be role models and improve practical advice.
- Coaches should effectively collaborate with sports nutritionists for sustainability (IO1)
- Coaches should deliberately encourage their athletes to adopt/develop sustainable dietary habits (Hackman et al., 1992)
- Coaches ought to consult with sports nutritionists to improve the sustainability of the team's diet during travel for away games and conduct a sound needs analysis in partnership with sports nutritionists (IO1).
- Given that one of the biggest barriers to making athletes' diets more sustainable is their concern about performance decline (IO1), coaches should facilitate their athletes' sustainable diet adoption process by reducing performance loss concerns and clearly expressing their support throughout this challenging journey.
- Coaches should increase their familiarity with available digital technologies such as food waste applications and actively benefit from them for sustainability.
- Coaches should deal with continuing professional development specifically focused on the integration of sustainability into athletes' diet routines and actively utilise digital technologies that facilitate such diet processes (IO1, IO2)

4.2. Conclusion for Part One

As yet, we have attempted to provide a detailed outline of the significance and multifaceted topic of sustainable dietary guidelines for athletes. The implementation of sustainable diets for athletes needs a comprehensive approach that takes into account several dynamics such as preserving performance, injury prevention, and high nutritional requirements. Therefore, the integration of sustainability into athletes' diets may be more challenging compared to non-athlete populations due to their unique needs. In view of this fact, we recommend adopting the five steps outlined by Meyer et al. (2020) as a framework for integrating sustainability into athletes' dietary choices.

Figure 6. Adapted from Meyer et al. (2020)

We also addressed reasonable strategies that athletes and sports professionals, such as coaches and sports nutritionists, can apply for incorporating sustainability in modern sporting life.

Figure 7. Sustainability Strageties

In conclusion, while integrating sustainability into athletes' dietary choices is not an easy process, it is an imperative journey toward promoting environmental sustainability. In this context, the collective efforts of athletes, coaches, sports nutritionists, and other sports professionals, supported by continued research and technological advances, can pave the way for a more sustainable future in the sports realm. Furthermore, integrating sustainability into athletes' diets may inspire their devoted fans to take similar steps in the same direction.

5. POLICY RECOMMENDATION FOR NATIONAL AUTHORITIES

In this part of the guideline, we discuss the integration process of sustainability practices for athletes into National Dietary Guidelines (NDG) and provide a set of policy recommendations aiming to assist national authorities towards that end. In this context, this part starts with a chapter focusing on the structure recommendations. In the second chapter, the importance of the integration of a sustainable diet for athletes into the NDGs is attempted to be justified. Since partner countries will seek to integrate the sustainability of athletes' dietary choices into NDGs for the first time, the third chapter discusses the risks, challenges, barriers, and opportunities in the journey of integration of sustainable diets for athletes into NDGs.

In Chapter 4, a collection of some best practices/innovative activities to raise awareness of sustainability in the sports world are presented (i.e., best practices from the sports industry related to sustainability, along with innovative strategies from various sectors that could be adapted for use in the sports realm.) Since the current sports regulations and policies are not sufficient to promote sustainability, chapter 5 proposes some regulation and policy changes. Hereafter, the final chapter provides a number of few recommendations for future directions in the integration of sustainability into athletes' dietary practices. Before delving into these chapters, however, it is necessary to better discuss the nature, scope, dimensions, and structure of the "Sustainable Diets for Athletes" sections in NDGs.

5.1 Structure Recommendation for National Dietary Guidelines Chapters Focusing on the Integration of Sustainability into Athletes' Dietary Choices

A well-structured chapter in dietary guidelines regarding the integration of sustainable dietary practices tailored for athletes should begin with an overview of current knowledge about sustainability, followed by the roles of nutrition since, and general sustainable diet practice. Subsequently, a detailed section should be addressed on the role sports professionals such as coaches and sports nutritionists. Lastly, strategies that assist practitioners in increasing sustainability in our dietary choices should be presented. Given that there can be serious concerns about the potential impacts of dietary change on performance, convincing athletes and sports professionals to alter their traditional dietary habits can be challenging. Hence, these chapters should consider the behaviour change process, adopt evidence-based approaches, highlight the long-term benefits of such changes (e.g., health benefits, performance, environmental). If real behaviour changes are targeted, it is also essential that these chapters address myths and misinformation about food components and their effects on athletic performance.

Lastly, these chapters should include appropriate recommendations on how these suggestions can be implemented in the premises of existing national sports policies, regulations, cultural values, national dietary habits, and economic and geographical conditions, while also challenging them. Inherently, many recommendations for sustainable diets for the public are like those for the athletic population. For example, opting for shopping local, seasonal, and fresh produce is valid for everybody. Nevertheless, as mentioned above, the requirements for macro- and micronutrients are different for athletes compared to the general population. Furthermore, there are various concerns regarding athletic performance. Concerning the planning of shopping and food consumption, there are also varying needs, especially for professional athletes. Therefore, the recommendations for athletes focus predominantly on plant-based protein alternatives, sustainable meal planning, the use and risks of supplements, and the incorporation of coaches, nutritionists, and sports organisations into the transition to more sustainable diets.

For these reasons, general advice on sustainable nutrition should be complemented with specific information on sports nutrition, and respective citation. Organizations and scientists working in the fields of nutrition, sports, and sustainability can be consulted or worked together in a consortium. Having said that, we pursued to justify the importance of the Integration of Sustainable Diets for Athletes into National Dietary Guidelines in the following chapter.

5.2 Justification for the Integration of Sustainable Diets for Athletes into National Dietary Guidelines

The concept of dietary sustainability, outlined by the FAO, encompasses not only nutritional and environmental considerations but also economic and socio-cultural dimensions.

A key strategy that has been adopted by many nations looking to incorporate sustainability principles in their food policies is the development of recommendations promoting specific dietary practices and their integration into Food-Based Dietary Guidelines (FBDGs). These dietary recommendations are often addressed to specific population groups with unique nutritional or other needs, such as people of different ages or with specific dietary restrictions. Athletes, a group with unique diets and nutritional requirements who exert great influence in the wider society, should not be exempt from such recommendations. In that view, this chapter aims to shed light on why the theme of the sustainability of athletes' dietary choices should be integrated into existing National Dietary Guidelines.

5.2.1. The Athletes' Diet and Its Influence

Athletes are not just individuals competing on the field; they are role models, inspiring millions of people globally. Especially in the case of professional and high-performance athletes, the carbon footprint of their diet extends far beyond their plate. If athletes aligned their diets with sustainability goals, they would serve as ambassadors for responsible consumption, influencing not only their peers but also the wider public. Athletes incorporating sustainable principles into their diet could contribute to a larger cultural shift towards environmentally conscious living.

Regrettably, athletes' dietary choices are often geared towards performance, disregarding impact on the environment. As a rule, an athlete's diet involves large quantities of meat, particularly red meat, to meet the high protein demands for muscle building and repair, even though the livestock industry is a major contributor to greenhouse gas emissions, deforestation, and water pollution worldwide. That is why, integrating both sports nutrition and sustainability considerations into National Dietary Guidelines would provide athletes and other sports professionals with the knowledge required to change their current habits into more sustainable ones without sacrificing athletic performance.

5.2.2. The Role of Nutritional Sciences

Contrary to the conventional belief that athletes require copious amounts of animal protein, there is a growing body of evidence demonstrating that plant-based diets can adequately meet the nutritional needs of even high-performance athletes. A well-planned plant-based diet can provide sufficient protein, essential amino acids, and micronutrients crucial for athletic performance.

Advancements in nutritional science have illuminated the potential benefits of sustainable diets for athletes. From improved recovery to enhanced endurance, plant-based diets have shown positive outcomes. For example, research published in the Journal of the International Society of Sports Nutrition found no significant differences in performance outcomes between athletes following plant-based diets and those adhering to omnivorous diets (Heather et al., 2018). Additionally, the emphasis on whole, plant-based foods has been associated with a reduced risk of chronic diseases such as cardiovascular diseases, certain cancers, and type 2 diabetes (American Heart Association, 2018). Athletes adopting sustainable diets can thus ensure their health over the course of their careers, promoting sustained performance and longevity. The American Heart Association acknowledges that plant-based diets, when appropriately planned, can provide health benefits and reduce the risk of chronic diseases.

Integrating such findings into National Dietary Guidelines can serve as a foundation for evidence-based dietary recommendations that prioritisze both athlete health and environmental sustainability. By challenging the stereotype of a meat-centric athletic diet, National Dietary Guidelines can support a shift towards a more plant-centric approach that aligns with the broader global agenda of sustainable development.

5.2.3. Aligning With Global Sustainability Goals

Nations worldwide are increasingly committing to international agreements aimed at mitigating climate change and fostering sustainable development. The integration of sustainable diets for athletes into National Dietary Guidelines aligns with these commitments, highlighting a nation's dedication to environmental stewardship and responsible consumption. Such alignment is crucial in the global effort to achieve the Sustainable Development Goals (SDGs) set forth by the United Nations.

Given that athletes have a different set of nutritional requirements from the general population, there is a need to address them specifically within NDGs. National Dietary Guidelines should incorporate crucial information to help athletes and sport professionals carefully evaluate the overall quantity, quality, and distribution of protein, and to avoid excess intake as a first step to an environmentally friendly approach. Food specific recommendations should be provided alongside the knowledge needed for athletes to make responsible food choices without compromising their health or their performance.

NDGs that are addressed towards athletes could also include other themes related to sustainability, such as minimising food wastage and selecting food from sustainable sources. While highlighting strategies to minimise waste, NDGs could encourage athletes to adopt mindful eating practices, plan meals effectively, and repurpose leftovers. Additionally, NDGs could inspire athletes to promote sustainable sourcing and local agriculture. By exerting positive influence on their communities and driving demand for ethically sourced and locally produced food items, athletes could foster environmental sustainability while helping bolstering local economies.

5.2.4 Educating Athletes and The Public

Incorporating sustainability into National Dietary Guidelines is not just about changing the habits of athletes but also about educating them and the public. As part of Susdiet Consortium's commitment to advancing knowledge and skills in sustainability, we are excited to introduce our latest online training offering. This training is the outcome of a collaborative effort done by the consortium, which sought to create a thorough learning experience that addresses the current and future needs of this field [3].

This kind of educational components are fundamental, as it empowers athletes to become advocates for sustainable living and facilitates the dissemination of crucial information. Athletes, often seen as idols and influencers, possess a unique platform that extends far beyond the sports arena.

5.3 Challenges, and Opportunities in the Integration of Sustainable Diets for Athletes into NDGs

The integration of sustainable diets for athletes into national dietary guidelines (NDGs) involves an intersection of nutrition, environmental, sustainability and athletic performance. Although increasing sustainability in athletes' diets should be a priority, with a growing recognition of the need for sustainable food practices in this population, the existence of some challenges must be considered. Overcoming these barriers is essential to increase sustainability in the athletic population. In this spirit, the major challenges that should be considered are stated below:

5.3.1 Challenges

1. Nutritional requirements: The inclusion of more sustainable choices in an athletes' routine must ensure that these alterations meet their nutritional requirements. It is known that athletes have different needs when compared to the non-athletic population, such as an increased protein intake and some micronutrients.

Therefore, finding a balance between sustainable goals and the fulfilment of their nutritional needs is crucial.

2. Lack of knowledge: Although there is increasing research regarding sustainability in general, studies involving athletes are limited. As the balance between athletes' nutritional needs and sustainability is not well-explored, it is crucial to increase collaborations among dietitians/nutritionists, researchers and policymakers in order to increase the athletic population's knowledge concerning sustainable diets**.**

3. Resistance to change: Convincing not only athletes, but also the sports community to change their traditional diet may be difficult, as they might fear to lose performance. Also, changing their traditional diets may be challenging. More clearly, the traditional dietary plans prioritize individual macro-, and micronutrients' needs without considering the environmental impact. Together with the limited research regarding this topic, achieving dietary recommendations while minimizing environmental footprint requires some adaptations that might be difficult to implement.

4. Availability and Accessibility: Dietary preferences vary among the different cultures. Also, access to a variety of sustainably sourced foods can be limited in certain areas. Athletes in such regions may face challenges in obtaining the recommended sustainable dietary options. Therefore, implementing a "one-size-fits-all" approach may not be effective, making it necessary to adapt according to the context.

5. Cost implications: Economic factors, including the cost of sustainably sourced foods and the potential financial burden on athletes, also contribute to resistance in incorporating sustainability into NDGs although increasing sustainability does not necessarily mean increasing the dietary costs.

6. Limited Research: Although there is growing evidence regarding the relationship between sustainability and athletic performance, there is still a lack of comprehensive research on the intersection of sustainable diets and athletic performance, making it difficult to provide evidence-based guidelines.

7. Lack of knowledge/awareness: Many athletes and even nutritionists may not be fully aware of the principles of sustainable diets or the environmental impact of different food choices.

8. Industry Resistance: The food industry may resist changes that could impact their existing supply chains and profit margins. This resistance can create barriers to the widespread adoption of sustainable diets.

5.3.2. Opportunities

The integration of environmentally conscious diets has the potential to redefine the relationship between athletes, their nutrition, and the broader ecological landscape. Despite all the challenges and the barriers that were discussed previously, the integration of sustainable diets in athletic populations may open the door to a realm of opportunities such as:

1 - Inclusion of educational programs: Educational programs are important to raise awareness and increase knowledge about sustainability not only among athletes but also amongst the athletic population. The impact of dietary patterns on one's health and on the planet must be covered in these programs. Also, they should emphasisze the importance of implementing environmentally-conscious food choices with practical examples.

2 - Innovation in Food Production: The food industry should be encouraged to adopt environmentally friendly practices, such as reducing carbon emissions and minimizing waste, resulting in more sustainable products. These products should include foods that athletes are prone to choose, i.e., that fulfill their nutritional needs but without compromising the environment. Moreover, the availability of these sustainable-friendly products in the market might lead to changes in the consumption habits of recreational/amateur athletes, shifting from the conventional high-protein and/or high-energy products to these new options.

3 - Collaboration between various stakeholders: Sports organisations, nutritionists, environmental experts, and policymakers can work together to create evidence-based guidelines that account for both the performance requirements of athletes and the ecological impact of their diets. This multidisciplinary approach ensures a holistic perspective, leading to more effective and sustainable dietary recommendations.

4 - Public Awareness and Advocacy: As role models, athletes can use their influence to raise awareness about sustainable diets. As public awareness plays a crucial role in facilitating change, athletes may inspire their public to adopt more sustainable choices.

5 - Policy Support: Governments can play a crucial role by incorporating sustainability considerations into their dietary guidelines. Policy support can also involve financial incentives for sustainable agriculture, research funding for initiatives exploring the intersection of nutrition and sustainability, and regulations that encourage food producers to adopt environmentally friendly practices.

5.4 Best Practices/Innovative Activities to Raise Awareness of Sustainability in the Sports Field

Nowadays, it is very evident that there is a direct connection between the sports field and ecology since many sports depend on their practices, conditions, and resources in the natural environment. Because of that, environmental problems must be seriously taken into account (FEMP, 2011). More often than not, local sports agents, stakeholders, and the general public have a local vision of the world and they do not observe the real global consequences of their actions. This is why all people around the world must start thinking and acting according to the principle of "think globally, act locally".

Sports, on the other hand, is the most consolidated and strongest international field that exists, as it is a global movement that knows hardly political or ideological borders. Likewise, it can transmit values and rules from one end of the planet to the other, almost in an instantaneous mode (Green Cross España, 2011).

In this direction, the Council of the EU recognised at the last meeting of the Sport Working Plan group that sport plays a very important role in society, including the adoption of a varied, balanced, healthy, and environmentally sustainable dietary pattern (Report of the Scientific Committee of the Spanish Agency for Food Safety and Nutrition (AESAN) on sustainable dietary recommendations and physical activity recommendations for the Spanish population, 2022). Although there are also other international organisations (such as the UN with the SDG strategy) or supranational entities (such as the European Union with its Agenda 2030 and laws to be implemented by its member states) that are trying to address the environmental problem, there is still much to be done at the global level to fully mitigate or alleviate the problem of human impact on the environment. As such, this chapter contains recommendations, strategies and responsible practices related to sustainable food in the world of sport. The practices are drawn from already available documentation: recommendations and good practices at the national level in the countries involved in this project, practices implemented by sports associations and clubs.

The recommendations and practices will be correctly cited in the document, while there will also be ideas that have been obtained from the debate generated among the project partners and that have been considered relevant to include in this document. The latter will not be specifically referenced. A compilation of measures at European level that affect the issue of food will be presented, followed by good practices and initiatives carried out in different countries; recommendations that sports professionals should implement in their daily lives to follow a sustainable diet with less impact on the environment; and, finally, recommendations that associations and/or sports clubs should implement to promote sustainability when holding sport events.

5.4.1 General Best Practices/Innovative Activities

- EU's Circular Economy Action Plan: to promote the use of sustainable packaging materials. [1]
- Review of the EU legislation regarding food contact materials, to support the uptake and adoption of more innovative and sustainable packaging solutions and contribute to the reduction of food waste (retrieved from: https://www.newfoodmagazine.com/article/161989/lets-talk-sustainability-for-the-sports-nutrition-sector/).
- Recommendation for businesses to take responsibility for the goods they place on the market and work to establish practices to ensure waste is managed in a responsible, sustainable and circular manner. (retrieved from: https://www.newfoodmagazine.com/article/161989/lets-talk-sustainability-for-the-sports-nutrition-sector/)
- EU Commission's upcoming policy proposal for a compulsory supply chain: due diligence legislation; to advance operational transparency and sustainable sourcing in the food sector. The sports nutrition industry's contribution to this objective can be vital, taking active steps with suppliers to ensure value chains are more transparent and allowing ingredients to be fully traced to their sources. (retrieved from: https://www.newfoodmagazine.com/article/161989/lets-talk-sustainability-for-the-sports-nutrition-sector/)

5.4.2 Sports Specific Best Practices/Innovative Activities

Research:

European Specialist Sports Nutrition Alliance: European trade association for any company operating in the sports nutrition sector.

EU Research and Innovation Magazine

Region of Murcia (Spain): development of activities for the promotion of a healthy lifestyle through investments in the biomedical and sport fields.

In this way, the investments focus on the research of new food products and medicines for people practicing sport at different levels, as well as monitoring IT tools and newly developed apps. (Mapping smart specialisation strategies for sport, EU Commission, 2018, p. 8) https://www.newfoodmagazine.com/article/161989/lets-talk-sustainability-for-the- sports-nutrition-sector/

5.4.3 Companies offering sustainable products

Ooho Water: a product designed as an innovative alternative solution to the classic plastic bottles and to mitigate container contamination. Created by Skipping Rocks Lab, an innovative sustainable packaging company.

Air Protein: a Californian startup that has created a meat alternative made from microbes that turn recycled carbon dioxide into protein.

Solein: protein-rich food made from electricity, air and water laced with bacteria created by Solar Foods in collaboration with the VTT Technical Research Centre of Finland and the Lappeenranta University of Technology.

5.4.4 Global Partnerships

Global Sustainable Sport: an organisation that aims to bring the global voices of sport together and to drive sustainability through sport to provide a better future for the sports field and the planet.

Pledge Ball: a platform for fans to push their sport teams to increase positive environmental measures.

Canopi: a next-gen nutrition platform that replaces powders and pills with grow-at-home superfood cultures.

Paris 2024 Olympic Games: commitment to provide 100% sustainable and certified food and to donate those not consumed during sports events (Manual Of Good Practices For Event Managers And Sports Volunteers)

5.4.5 European initiatives and news

HealthyLifestyle4All initiative: campaign to promote a healthy lifestyle for all

GREEN SPORTS HUB: EU-funded project to create an EU-level hub

SHARE: SportHub Alliance for Regional Development to improve sport's environmental performance.

5.4.6 Digital applications for reducing food waste

- Too good to go (Europe)
- Phenix (Spain)
- Talkual (Spain)
- Benebono (Spain)
- Bring it Back (Greece)
- Mystery Pot: End Food Waste (Greece)
- SavingFood (Europe)
- Refood (Portugal)
- ResQ Club (Germany)
- Olio (Germany)
- Globble (Malta)

5.4.7 Best Practices by Organisations

- *Athletes Houses*: Advice on the design of the catering offer, with special consideration of the sporting profile of the facility (DOSB: German Confederation for Olympic Games (dosb.de).
- Offer professional and expert advice to tailor diets to the specific needs and practices of the particular sport from a nutritional and sustainable perspective to ensure a needs-based nutrient supply and avoid possible nutrient deficiencies.
- Hot and cold beverage vending machines or vending services: install glass soft drink machines with automated return systems. (Guide for sustainable sport entities, 2011)

- Sale of Fairtrade products in vending machines and in bar and cafeteria services in sports facilities and open-air tents at urban sports events or natural spaces
- Use sport events to transmit the principles and values of the SDGs (Junta de Andalucía, 2020, p. 30).
- Calculate the environmental impact of sport events (carbon footprint, waste generation, resource consumption, etc.) to take actions to minimise the impact (Junta de Andalucía, 2020, p. 30).
- As far as possible, carry out sports activities outdoors and in nature to promote healthy lifestyle habits (Junta de Andalucía, 2020, p. 30).
- *An employee, a tree*: The Atlético de Madrid Foundation, in collaboration with Sheedo, has joined the World Environment Day (June 5) by giving a tree to Atlético de Madrid employees, so that they can plant them in their surroundings and thus join into the challenge of building a greener future.
- *Replant Madrid*: The club has joined the Re-Planta Madrid project, an exciting project launched by Madrid Futuro that has the purpose of replanting more than 10,000 trees in the city and recover the tree heritage lost after the Storm Filomena in the capital. At Re-Planta Madrid the club employees participate directly in planting trees across the city.

There are many ways in which it is possible to raise awareness about environmental sustainability in the sports field. As seen, many innovative practices can be implemented at different levels: local, national, and international. Every individual must take some steps towards environmental sustainability so that the sum of all our actions can contribute to mitigating and reducing the impact of climate change. The role of sports organisations, especially those with large fan bases, is vital for the mainstreaming of sustainable practices that individuals can consciously and unconsciously transfer into their daily lives. Popular sports clubs should also contribute, as they can give a good example not only to their fans, but also to their athletes, thanks to their enormous sphere of influence.

5.5 Recommendations For Regulation and Policy Changes in Sports

Since the current national sports regulations and policies remain incapable of or often overlook promoting sustainable diets for athletes, some regulation and policy changes are needed. Although national and international authorities put some policies into practice to make sports events more sustainable by considering the travel of athletes, coaches, spectators, and other professionals, the use of sustainable sports equipment, and the use of renewable energy sources in matters such as air conditioning and lighting of sports facilities (Sotiriadou & Hill, 2015), there is an absence of availability of policies and regulations focused on sustainable dietary practices for athletes. For instance, no policy or regulation considers the use of water in plastic bottles, canned drinks, and packaged foods consumed by athletes during sports events. Policy changes aiming to reduce the use of such foods and drinks or regulatory changes enforcing the use of eco-friendly alternatives for these items can significantly contribute to reducing non-sustainable dietary given that hundreds of millions of people participate in such events either as athletes, coaches, or spectators every year in the EU (Eurostat, 2017). Therefore, this chapter addresses the potential policy and regulatory changes that national authorities could implement to disseminate sustainable dietary practices among athletes.

Recommendation 1 - (Seasonal sustainable diet policies): According to BBC research report (2023), the expansion in European sports competitions, particularly in football, means increasing the sport's environmental footprint due to more games, and inevitably, more flights (please visit the website https://www.bbc.co.uk/sport/football/67159156). The carbon footprint of this mobility is approximately calculated (368,388 tonnes of CO2e for 2022-23 emissions from team and fan travel). On the other hand, research examining carbon emissions from food, beverages, and waste in England's lower league football estimates an annual total of approximately 30,000 tonnes (Goldblatt et al., 2020). However, we don't have data of athletes' sustainable consumption patterns in the EU.

Therefore, national authorities should develop tools to measure the footprint of athletes' dietary practices. Such interventions may initially begin with the self-reporting method by clubs and athletes since national authorities may take time to employ inspectors and provide training. In the progress of time, more systematic, elaborative, and on-site inspections can be put into practice.

Recommendation 2 - (Sustainable diet during sportive travels): The International Air Transport Association noted that airlines generated 5.7 million tonnes of cabin waste, with approximately 80.5% being unused food and drinks (You et al., 2020). The literature indicates that passengers play a key role in airline food consumption (You, 2022). Athletes, broadly sports teams, often need to travel for away games and pre-season camps, however, we don't know the environmental impact of their dietary practices during such travels. Moreover, since sports teams can consume more food than non-athlete passengers due to their high energy intake needs and it is known that more food and more energy are consumed while going to sports events (Goldblatt, 2020). In this context, some policy and regulation changes may foster sustainability during sports teams' mobilities.

- National authorities can stimulate sports teams to choose airline and bus companies with sustainable food policies for their away-game travels.
- NDGs can provide strategies for athletes to maintain sustainable diets during away-game travels.
- A study revealed that the number of wasted vegetables consists of almost half of the total food during the travel operation (Thamagasorn & Pharino, 2019). There may be particular attention to reducing vegetable waste during away-game travels, particularly since athletes have limited knowledge about plant-based diets. (please visit https://www.sustdietproject.eu/ to see project outcomes regarding athletes' food preferences and knowledge level about sustainability). More precisely, providing plant-based foods for athletes during these travels may not necessarily increase sustainability, and could potentially have an opposite effect if it doesn't coincide with the athletes' knowledge and conscience around these topics.

Figure 8. Depiction of Travel Food Waste Issue: https://edition.cnn.com/travel/article/airlines-cabin-waste/index.html

Terefore, such policy and regulation changes should be underpinned with training for athletes, sports clubs, and sports professionals.

Recommendation 3 - (Sustainable diet regulations for local, regional, and national competitions):

Based on the results obtained from past championships, Euro 2024 is expected to generate around 490,000 metric tons of CO_2 emissions, as projected by the German Government (Stahl et al., 2022). Forbes (2023) reports that UEFA is making a substantial investment of 32 million euros to ensure Euro 2024 in Germany. This becomes the most sustainable football tournament on the earth.

Notwithstanding, while the environmental effects of major international sports events can be approximately calculated, such as EURO2024 (UEFA, 2021), the environmental impacts of national and lower-level sports competitions, especially in terms of athletes' food consumption, remain largely unknown. In other words, the national authorities of most countries do not have any regulations or policies aimed at ensuring sustainability throughout such competitions.

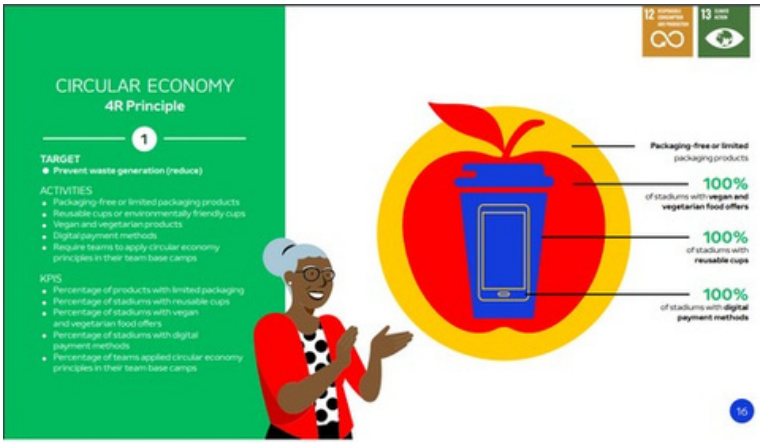

Figure 9. UEFA 2023 ESG Stragety

- National authorities should formulate policies enabling the assessment of the environmental impact of local, regional, and national sports events in terms of athletes' food consumption.
- National authorities can integrate some strategies into their NDGs that ensure sustainable diet strategies for athletes throughout such competitions.
- To enhance the overall sustainability of such events, national authorities, like sports federations or sports ministries, could introduce regulations that urge clubs and athletes to prioritize sustainable food consumption during competitions.

Recommendation 4 - (Considering cultural and moral values):

In achieving regulation and policy changes regarding sustainable diets for athletes, the role of culture and moral values should be considered (Munshi et al., 2020). Instead of directly incorporating internationally recognized sustainable nutrition practices into the National Dietary Guidelines (NDGs) or directly adopting international policies and regulations into national practices as they currently exist, these practices should be adapted by considering the cultural and moral values of relevant nations. For instance, while reducing pork consumption which is a key aspect of animal-based nutrition might be difficult in EU countries, this isn't a significant issue for a sustainable diet in Turkiye, where the majority Muslim population typically avoids pork. The impact of cultural and moral values on the integration of sustainable nutrition to combat climate change is well illustrated in the figures below (Munshi et al., 2020).

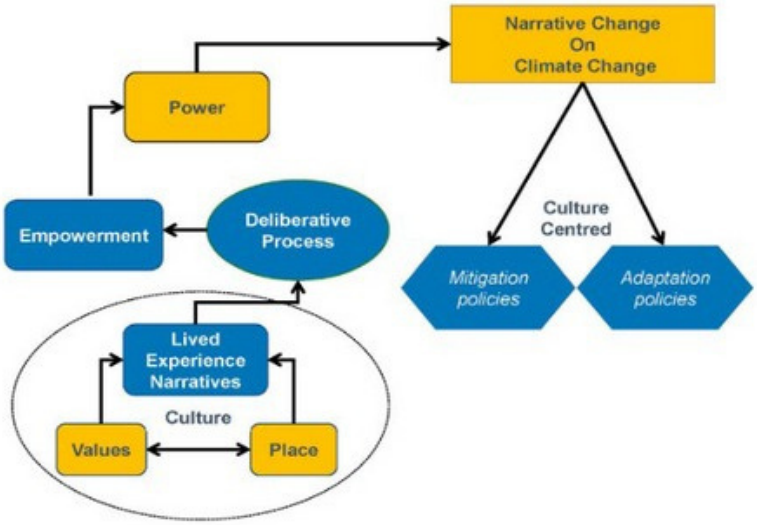

Figure 10. Munshi et al., 2020

Recommendation 5 - (Regulation of supplement use):

Athletes' primary motivations for using dietary supplements are to increase their performance or fasten the recovery process (Teixeira, 2013). Athletes frequently consume such dietary supplements (Knapik et al., 2016; Gençoğlu et al., 2021; Daher et al., 2022). Some regulation changes may help to reduce the environmental impact of these dietary supplements.

- Legal regulations can be implemented to encourage manufacturers to produce plant-based dietary supplements for athletes or at least to manufacture these supplements using environmentally sustainable practices, such as eco-friendly packaging.
- Just as national authorities have embraced the World Anti-Doping Agency's (WADA) prohibition of performance-enhancing dietary supplements, national authorities can also adopt measures permitting the use of eco-friendly nutritional supplements. In other words, they could periodically publish a list of unsustainable dietary supplements and exercise sanctions on athletes who consume any of these supplement products.

Recommendation 6 - (On-site sustainable diet practices for sports organisations):

Given the limited capacity of national authorities to oversee on-site sustainable dietary practices of sports organisations, sports organisations can put regulations into practice to enhance and promote sustainable dietary practices for these organisations.

- Enforce legal regulations for sports organizations mandating the employment of certified sports nutritionists with expertise in sustainable dietary practices. Thus, such experts can facilitate the sustainability transformation of sports organization.
- National authorities can establish a sustainable dietary framework for sports organizations, providing guidelines for the development of seasonal sustainable dietary practices. Sports organizations should be required to submit their action plans to the national authorities before the commencement of each season. Like the financial fair-play regulation applied by UEFA, through the adoption of this action plan, sports organizations commit to meeting the minimum sustainability criteria set by national authorities, for eligibility of providing sports services and participating in national sports activities.

5.6 Future Directions

The proposed guidelines offer a few tangible and feasible recommendations for future directions that have been suggested for experts, stakeholders, beneficiaries, policymakers, athletes, and coaches in the health and sports fields.

1 - In our project, data was gathered through surveys, relying on self-reported information from athletes and sports professionals. It is thus suggested that national sports authorities undertake empirical research to observe and analyse athletes' attitudes toward promoting, achieving, and implementing sustainable diets. This method would provide more objective, scientifically grounded insights into how athletes perceive and engage with sustainability in their dietary choices.

2 - Longitudinal studies exploring the impact of sustainable dietary preferences of athletes on their performance are limited.

3 - Integrating sustainable diet practices for athletes with other sustainable initiatives, if feasible, can produce better results and facilitate the implementation of the recommendations that this project is proposing.

4 - Although athletes are considered as role models and theoretically have substantial influence on their fans, the impact of athlete's sustainable dietary practices on their fans is unknown. Possible positive findings could stimulate food chains to provide more sustainable food supplies.

5 - Before putting legally sustainable diet regulations for athletes into practice, there is an urgent need to comprehend the perceptions, knowledge, and attitudes of all stakeholders of sports towards such regulation changes. Thus, gathering such data can facilitate any potential initiatives in this direction.

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NATIONAL POLICY RECOMMENDATIONS

GERMANY

This chapter represents an addition to the general recommendations, tailored to the German context.

A 2016 FAO analysis (Fischer & Garnett 2016) found that only four of the 83 countries that their research found had official dietary guidelines explicitly took environmental factors into account (Germany, Brazil, Sweden and Qatar) (p.17). The study also examined the content of the German guidelines in more detail. The FAO notes that ecological sustainability is only mentioned in passing in the DGE's 10 rules. However, since this analysis, additional editions of the 10 Rules have been published. The current guidelines were published in 2024 and are fundamentally geared towards a sustainable diet for the first time (DGE 2024). A reduction in the consumption of animal foods and an increase in the consumption of plant-based foods is recommended as a guideline and their health-promoting and ecological benefits are explained. Nevertheless, the choice between vegan, vegetarian and flexitarian diets could be made clearer, instead of presenting fish and dairy products as an essential part of the diet. However, the supposedly sustainable recommendations for fish such as the MSC logo or palm oil are questionable because it is now known that standards are demonstrably not being met or that very inadequate standards apply (Greenpeace 2017). Local and seasonal, and if possible organic, food is also advised and tips for avoiding food waste are provided. Reference is also made to the Sustainable Shopping Cart of the Council for Sustainable Development, which offers recommendations for more socially and ecologically sustainable shopping (RENN Netzwerk 2024). The website classifies various seals and gives assessments on specific subject areas such as “organic from overseas”, “palm oil”, etc. This can provide a good initial orientation, but the information is partly superficial and a critical classification of certain seals etc. is not done at all or only marginally.

The DGE continues to dedicate a separate section on its website to the basics of a sustainable diet, the UN Sustainable Development Goals, the Planetary Health Diet and measures and strategies of government organizations to implement sustainable diets. Accordingly, it can be seen that sustainability has increasingly become the focus of the DGE's recommendations in recent years.

Furthermore, there are guidelines for athletes. Although these repeatedly mention ecological sustainability aspects such as the use of a reusable glass bottle instead of a plastic bottle or information about seasonality and locality, the consumption of animal products, for example, is not questioned and a fundamental focus on sustainability aspects is missing.

Part of this more sustainable orientation is also the key issues paper that the German Ministry of Food and Agriculture (BMEL) published in 2022 as the basis for a comprehensive new nutrition strategy for the federal government. The strategy will include a series of goals and measures to be implemented by 2050 to ensure a healthier and more sustainable diet for the German population. The key points include:

1. Create a health-promoting and sustainable food environment
   - Community catering
   - Shaping the consumer landscape and prevention structures
   - Plant-based diet
   - Social aspects of nutrition
   - Promote movement
   - Structures and process
   - Monitoring and research
2. Promote resource- and climate-friendly approaches
   - Sustainable food production and supply
   - Reducing food waste
3. Nutrition literacy: promote healthy and sustainable eating patterns
   - Nutrition for special consumer groups
   - Nutritional recommendations
   - Nutritional communication and information
   - Nutrition education

The strategy focuses on combining health-promoting, ecological and social approaches. A structural transformation of the food system is being pushed, starting at various points from production to consumption in order to make healthy and sustainable diets as easy as possible for all consumers.

An increased plant-based diet with the Planetary Health Diet as a guideline is declared the goal. Nutritional recommendations for athletes or other specific approaches for the sports sector have not yet been explicitly provided for. Below we look at some points from the paper and how they can be expanded or adapted to the sports context.

Nutrition education in childhood and youth is a central aspect of the strategy; this could also be explicitly adapted to sports nutrition and implemented together with schools and sports clubs for young people who are active in sports. Furthermore, communal catering in daycare centers, schools and hospitals should be redesigned in a socially and ecologically sustainable manner; this would also be adaptable to sports organizations and increases both financial accessibility and the offer for a broader group of people. Regarding the paper, the consumption landscape should be designed in such a way that making healthy and sustainable choices is as easy as possible for consumers. This should be implemented, for example, through instruments such as the Nutriscore or the ecological footprint on food. These tools could be designed in a way that athletes can easily see additional sports-relevant information, such as protein content. A further point in nutrition education is the more comprehensive inclusion of nutritional topics, including sustainability aspects, in the curricula of medical courses. This could be expanded to include sports and nutritional science courses in order to comprehensively train the people who will later advise athletes. It should be noted critically that some of the measures are presented in a very vague manner and therefore offer a lot of scope for interpretation. This is of course due, among other things, to the fact that it is only a key points paper. However, it remains unclear to what extent the strategies will actually be implemented.

In summary, it can be said that approaches to promoting a more sustainable food system can be found in some places, but explicit measures and nutritional recommendations for sustainable nutrition for athletes still need to be developed. Therefore, putting together a consortium of sustainability and sports associations (DOSB and others) and DGE to jointly develop sustainable nutritional recommendations for athletes is highly recommended.

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GREECE

Background

Greece, with its rich cultural heritage, diverse culinary traditions, and unique environmental landscape, presents a distinctive context for weaving sustainability into the dietary regimens of athletes. In 2017, the Ministry of Health developed its strategic objective, adopted, and issued guidelines of dietary recommendations for a healthy population, including those with special nutritional requirements, aiming to improve the nutritional habits of the Greek people with an emphasis on the Mediterranean diet.

In particular, the nutritional recommendations provided in the guidelines concern:

(a) Adults. These recommendations are for the general population, and specific individuals aged 18 to 65 years;

(b) Infants, children, and adolescents;

(c) Women, pregnant and lactating; The recommendations concern women during reproductive age, pregnancy, lactation and menopause;

(d) People aged 65 and over.

Two (2) volumes have been published for each population group, one of which includes the nutritional recommendations and the second describes the scientific evidence behind them.

Despite the commendable effort of the Ministry to develop guidelines that incorporate modern considerations and scientific findings, the current National Dietary Guidelines do not integrate sustainability as a central focus, nor do they include a section specifically addressed to athletes, even though athletes constitute a distinct category with unique nutritional requirements.

In view of improving the existing guidelines in favor of sustainability, below we explore national-specific policy recommendations tailored to the cultural, environmental, and economic nuances of Greece.

Recommendations

2.1. Incorporate sustainability into the existing national dietary guidelines

Greece's dietary guidelines are not among the 37 countries that have included environmental sustainability considerations in their national guidelines[1], nor does the 2017 Greek National Nutrition Guide include sustainability aspects explicitly.[2]

Greece should consider incorporating sustainability in its national dietary guidelines to align itself with contemporary global developments, better support the health of its population and contribute towards meeting global sustainability goals.

2.2. Update the 2017 national nutritional guidelines

Professional athletes and the athletic population, in general, constitute a distinct population category with unique nutritional requirements. Despite that fact, in Greece, there is no specific national guidance on sustainable sports nutrition.

In view of this, Greece should consider updating 2017 guidelines with a relevant section, taking into account the unique nutritional requirements of each major sports group (e.g., aerobic / endurance sports, anaerobic / strength sports) and other variables, such as training load, intensity, sex, and age. Detailed information on plant-based protein sources and guidelines on their optimal absorption should be included as well.

2.3. Strengthen the role of Sports Nutritionists

Sport nutritionists are key in promoting and ensuring sustainable nutrition practices among athletes and the sports community. They can provide tailored education and awareness raising and can design individualized nutrition programs in close cooperation with the athletes themselves. In turn, athletes can not only enhance their health and performance but also contribute to creating a more responsible and environmentally conscious sporting community.

Apart from including sustainable nutrition considerations in national guidelines, national authorities should support sports nutritionists in promoting environmentally friendly dietary choices. To do so, they should provide sports nutritionists with tailored educational resources, workshops, and training programs focusing on sustainable sports nutrition.

[1]https://www.sciencedirect.com/science/article/pii/S2542519622002467?via%3Dihub#ceab10
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2.4. Provide education and incentives for sport clubs, organizations, and professionals

Unlike other EU countries, sustainable practices are not yet common among sport organizations in Greece. Ensuring successful implementation of sustainable nutrition for athletes by sports clubs, organizations, and professionals requires an integrated strategy. To foster positive change, Greek authorities should consider providing financial incentives, subsidies, or grants to sport organizations that adopt and promote sustainable practices, such as opting for plant-based catering, working with local suppliers who prioritize local and seasonal produce, and collaborating with food brands that align with sustainable values. Additionally, the implementation of mandatory education and training programmes in sustainable nutrition can ensure that those responsible for the nutritional planning of athletes are familiar with sustainable practices.

2.5. Raise awareness among athletes and sports professionals

National authorities have a central role to play in increasing athletes' and sport professionals' knowledge and awareness of sustainable dietary choices, while sports media and broadcasters have a unique opportunity to contribute to a culture of sustainability in the sports community. By systematically highlighting issues related to awareness of sustainability in sport and promoting good practices and success stories, they can inspire athletes and fans to make the switch to sustainable nutrition. Greek authorities should therefore consider organizing awareness campaigns using media channels, social platforms and sporting events, as well as through partnerships with sports organizations (clubs, federations) at national and international level to implement sustainable nutrition initiatives.

2.6. Establish robust monitoring and evaluation mechanisms

To maximize adherence to sustainable practices, authorities should consider establishing robust monitoring and evaluation mechanisms to reward and raise the visibility of organizations that spearhead change through implementing sustainable practices.

2.7. Embrace the Mediterranean Diet

National policies can promote the Mediterranean diet as a sustainable and nutritionally rich foundation for athletes. They should encourage athletes to centre their diets on traditional Mediterranean ingredients such as olives, olive oil, fruits, vegetables, legumes, and whole grains, as these foods not only align with the cultural palate but also offer a sustainable foundation.

In the case of athletes, it is paramount to focus on sustainable protein sources and include advice such as:

a) Fish and Seafood Choices: Advocate for the inclusion of sustainably sourced fish and seafood in athletes' diets. Highlight local varieties that are abundant in Greek waters, ensuring responsible consumption and minimizing the impact on marine ecosystems. Look out for ecolabels such as MSC, ASC, and Krav, or use the WWF's fish guide, to ensure fish farming methods do not excessively harm ecosystems.

b) Plant-Based Proteins: Integrate plant-based protein sources such as lentils, chickpeas, and local legumes. These not only provide essential nutrients but also contribute to a more sustainable protein profile.

2.8. Approach sustainability from a holistic perspective

Sustainability is a complex and multi-dimensional issue extending beyond individual health and athletic performance. Authorities should therefore consider incorporating diverse information into updated national guidelines, as well as exploring a wide range of strategies such as:

Culinary Education Programmes: Introduce educational initiatives highlighting the cultural significance of traditional Greek ingredients and recipes. Foster a sense of pride in athletes for their culinary heritage while encouraging sustainable choices within this cultural framework.

Support for Local Farmers: Implement policies that prioritize the support of local farmers and producers. Create incentives for athletes and sports organizations to choose locally sourced, seasonal produce, reducing the carbon footprint associated with long-distance transportation.

Waste Reduction Initiatives: Introduce regulations that mandate sports organizations to implement waste reduction programmes. Encourage composting, recycling, and minimizing single-use packaging to align with Greece's commitment to environmental sustainability.

Integration into School / University Curricula: Embed sustainable nutrition education into school curricula, starting from a young age and continue up to university level education. By cultivating an understanding of the environmental impact of dietary choices, future generations of athletes can make informed and sustainable decisions.

TÜRKİYE

In response to Türkiye's disappointing ranking of 58th out of 67 countries in the Food Sustainability Index by the Barilla Centre for Food and Nutrition Foundation, the Ministry of Health incorporated the Sustainable Diet as a significant focus in the Turkiye Dietary Guideline (TUBER, 2022). While the impact of this step is yet to be measured, further measures could enhance sustainability in Turkiye. In this context, some nationally specific recommendations regarding the integration of sustainability into athletes' diets can foster this process given that even lower-level sports leagues lead to thousands of tonnes of carbon emissions (Goldblatt et al., 2020).

Recommendation 1: Although the Turkish National Dietary Guideline released in 2015 did not cover sustainable diets, this phenomenon has been included in the recently published Guideline (TUBER, 2022). However, this guideline lacks a specific section addressing the needs of athletes who are interested in adopting sustainable dietary practices. In this context, the new Turkish National Dietary Guideline to be published:

- Should include a chapter to increase awareness and knowledge of athletes, nutritionists including sports nutritionists, and sports professionals such as coaches.
- Should provide how sustainable dietary practices differ from non-athlete populations.
- Should provide recommendations on how athletes can keep their performance at the highest level and recovery pace while adopting sustainability into their dietary preferences.

Given the highly centralized nature of the Turkish Sports system, which is under the control of the Ministry of Youth and Sports (Alev et al., 2021), close collaboration with this Ministry in developing national guidelines could expedite the integration of sustainability into the dietary practices of athletes.

Recommendations 2: Annually, 703 Olympic candidate athletes receive training in 36 sports training centres (STC) and 21 Olympic training centers (OTC) located across 18 provinces by hundreds of sports coaches, sports nutritionists, and other sports professionals in line with national policy starting with the regulation numbered 32028 dated 2010 (Imamoglu Et al., 2017). These athletes reside full-time at these Sports Training Centers (STCs) and Olympic Training Centers (OTCs). National Dietary Guideline can specifically address the integration of sustainable diet practices for future Olympic candidates. This is important because they will be role models for athletes who will come after them but also for society at large.

Recommendation 3: There are more than 265.000 licensed coaches in Turkiye and approximately 5 thousand coaches employed by the Provincial Directorate of youth and Sports under the Ministry of Youth and Sports (Genclik ve Spor Bakanligi, 2022). Throughout 2023 summer, millions of potential athletes are being trained by these coaches regularly organized by the Ministry of Youth and Sports. (AA, 2023). A significant proportion of these individuals turn into athletes and proceed to train in the winter season under the guidance of coaches from the Ministry of Youth and Sports. the majority of athletes are identified and coached in line with the Youth And Sports Services Law No. 3289 by these coaches (https://www.mevzuat.gov.tr/). In this context, several steps can increase the sustainability.

- The Ministry of Youth and Sports, holding significant authority and legislative power in the realm of sports, should enact legal regulations to foster sustainable diet practices among athletes.
- The Ministry of Youth and Sports ought to offer Continuing Professional Development (CPD) activities aimed at increasing the knowledge and awareness of their coaches about integrating sustainability into athletes' dietary practices.
- The Ministry of Youth and Sports, in partnership with the Ministry of Health, should develop a chapter within the national dietary guidelines, emphasizing the integration of sustainability into the dietary choices of athletes.

Recommendation 4: The Turkish Physical Education and Sports Curriculum Program (MEB, 2018a, 2018b) focuses on dietary practices that can be adopted by students engaged in physical activities and sports. However, this curriculum does not include sustainable diet practices for students who are either already athletes or potential athletes of the future. Therefore, future curriculum changes should consider integrating sustainable diet practices for athletes. Young individuals exposed to sustainable diet practices through physical education during their early sporting life are likely to adopt these habits more easily compared to those who first encounter them in adulthood. Therefore, national dietary guidelines should provide knowledge for PE teachers who teach and train future athletes. the Ministry of Health, tasked with formulating national dietary guidelines (TUBER, 2022), could partner with the Ministry of National Education to promote sustainable diet practices among athletes, thereby extending these practices to broader populations.

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MALTA

Recommendations for sports clubs and sports organizations

What is the national strategy for sport and physical activity in Malta?

The strategy recognizes the value of sport and physical activity towards a healthier, inclusive, economically-productive, ecologically- educated and balanced society. The following set of values will serve as guiding principles during the term of this strategy.

The ministry is launching a national strategy to ensure success in the years to come to motivate and attract more people to be involved in physical activity and sports throughout their life; to invest in sport in order to be truly able to achieve our true potential as a nation. This strategy maps out a clear way which will lead to excellence in sports with an emphasis on the fundamental basics which are needed to achieve success.

Recommendations for National Authorities

Our education minister, Dr. Clifton Grima, Parliamentary Secretary for Youth, Sport and Voluntary Organisations, envisions sport and physical activity as a way of life that will play a crucial role to serve as a solid foundation for improved participation in physical activity and excellence in sports. We need to continue investing in facilities, collaborate with local industries and focus our efforts on our communities whilst protecting sports integrity and providing the right platform for high-performance individuals. This ambitious plan and its implementation will provide a strong basis for long-term success to ensure an achievement for the thousands of volunteers, athletes, coaches and administrators that work in silence every day and to have elite athletes who bring medals, honour and satisfaction to our country.

Strategies for Integrating Sustainable Diets for Athletes into National Dietary Guidelines

The traditional Mediterranean Diet contains many dishes which are simple to prepare, are tasty and give several health benefits. Many Maltese dishes have these qualities and can easily be integrated into a pattern of healthy eating the Mediterranean way. Features of the traditional Mediterranean diet and lifestyle include:

- the use of seasonal, fresh and minimally processed foods so that prepared dishes contain significantly higher amounts of protective nutrients and substances that benefit people's health;
- fresh and seasonal vegetables and fruits; herbs and spices, legumes, cereals and nuts;
- regular and moderate use of olive oil;
- a moderate consumption of fish and seafood, eggs and dairy products (mostly yoghurt without added sugars or cheese);
- small amounts of meat;
- appropriate food portion sizes;
- home cooking and sitting around the table, preparing and sharing food in the company of family and friends;
- a moderate to vigorous level of physical activity; and
- adequate rest and sleep as part of a balanced lifestyle.

SPAIN

In Spain, the Strategic Plan for Health and the Environment 2022-2026 has been drawn up, which reveals the importance of implementing multidisciplinary policies, practices and actions in various aspects of life in order to care for the health of people and the environment around us. The document warns of the harmful effects on health caused by current contexts. It places great emphasis on the intersectional care of all aspects of food, including the care of water and the controlled use of chemical components in agriculture and livestock farming, which can produce irrevocable consequences on human health.
The relationship that this strategic plan articulates between human health and the environment is relevant when it states "Human health and the environment are closely related since there are many and diverse factors that surround us and influence the organism." (p.24). It is important to keep in mind that the actions we take are not isolated but influence all parts of life with a holistic effect.

This is why the care of the entire production system and chain affects the environment, especially the food chain: "The food system is one of the sectors that uses the most natural resources and pollutes the environment the most: it emits a third of greenhouse gases (responsible for climate change), is the sector that consumes the most water and pollutes, and is the main responsible for deforestation and loss of biodiversity" (AESAN, 2022, p.15). (AESAN, 2022, p.15). According to a report by the Ministry of Consumer Affairs (Ministerio de Consumo/JRC, 2022), food consumption is responsible for more than half of the environmental impact generated by a person, being evident the need to follow diets with a lower environmental impact. It has been estimated that widespread adherence in the Spanish context to a healthy diet that includes environmental impact criteria with respect to the current diet would prevent more than 80,000 deaths per year and reduce the emission of greenhouse gases by at least 70%; in addition, the use of various natural resources would be reduced by 25-55% (Springmann et al., 2020 in AESAN, 2022).

According to Law 17/2011, of July 5, 2011, on Food Safety and Nutrition indicates, in its Article 36, paragraph 2, "public health policies are established among which the development of dietary recommendations or food guides is included, as a key instrument to improve the diet of the population, as well as physical activity recommendations for the general population". In spite of this very generic section in the Spanish legislative framework, we do not find a specific regulation for the target group of this project, that is, the group of sports professionals, but for the general population with some specific guides for people over 65 years of age, and minors.

We find under the umbrella of action of the law materials that warn of the importance of combining sustainable food and nutrition and sport for the general public as is the case of the Scientific Committee of the Spanish Agency for Food Safety and Nutrition (AESAN) or the White Paper on Sustainable Food in Spain of the Alternativas Foundation. These studies state that "In Spain, there are cultural eating patterns that have demonstrated their beneficial effects on health, and can also be considered sustainable." (AESAN, p.) Among these patterns is the Mediterranean diet, which stands out for its nutritional components (consumption of foods of vegetable origin and fish, with moderate intakes of meat and dairy products).

In 2008 organizations in favor of the unification between sport and plant-based diets materialized through the Vegetarian Sports Union (UDV) (VeggieRunners as a nom de guerre and activism) advocate the promotion of a vegan/vegetarian diet.

Recommendations

Recommendations:
Taking as a reference the recommendations described in this document, in the Spanish context one should:

1. Study on sustainable diets focused on the sports field.
To consider the target group of professional athletes as protagonists of relevant studies and guidelines in order to offer a wider range of nutritional possibilities based on the different needs of the target group depending on the type of sport they perform.

2. Multidisciplinary education on nutrition patterns and sustainable diet.
Training programs on sustainable food consumption should be carried out considering the sports needs of professionals dedicated to this sector and including individual needs (age, gender, weight, height, pathologies, rhythm of life, eating style, type of sport practiced). This includes promoting the consumption of local and seasonal foods, organic foods, and products of plant origin, as well as knowing the impact on the environment of actions related to food consumption. This should include a focus on reducing food waste and reducing the consumption of products packaged in plastic.

3. Encourage the role of coaches and nutritionists in sustainable eating.
Work together to develop balanced meal plans that not only meet the nutritional requirements of athletes, but also minimize environmental impact.

4. Consider alternative protein options in catering services at events and sporting venues.

Exploring alternative protein options, such as plant-based proteins (tofu, tempeh, seitan) and sustainable protein sources such as sustainably caught fish and eggs from hens raised in animal welfare systems, can help reduce the environmental footprint associated with animal protein production. This also has an impact on event attendees and sports fans.

5. Labeling regulations and facilitating access to whole, local and seasonal foods.

Implement stricter food labeling regulations so that consumers can make informed decisions about the sustainability of the products they buy. Promote the purchase of whole, local and seasonal foods at affordable prices for the sports population.

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PORTUGAL

The pursuit of excellence in athletics is complemented by a growing awareness of the importance of sustainability within the sport's community. As athletes strive for peak performance, there is an increasing recognition of the need to minimize their environmental footprint and contribute to the planet's well-being. These recommendations highlight the dedication to promoting eco-friendly practices and empowering athletes to be champions not only in their sport but also in their commitment to a sustainable future.

Recommends

1. Allocate funds for research on the intersection of sustainable diets and athletic performance.

This research should address nutrient adequacy, performance outcomes, and long-term health impacts to provide evidence-based guidance.

2. Establish multi-stakeholder task forces involving athletes, nutritionists, environmental experts, policymakers, and representatives from the food industry.

This collaboration can ensure diverse perspectives and foster consensus on sustainable dietary guidelines.

3. Develop and implement educational programs targeting athletes, coaches, and nutritionists.

These programs should highlight the benefits of sustainable diets, addressing both performance and environmental considerations.

4. Integrate sustainability considerations into existing dietary guidelines and policies for athletes.

Ensure that national sports and nutrition policies reflect a commitment to sustainable practices and include incentives for

5. Recognize regional and cultural variations in dietary preferences and access to sustainable food sources.

Provide guidelines that are adaptable to local contexts, allowing for the promotion of sustainable diets without imposing a one-size-fits-all approach.

6. Encourage collaboration with the food industry

This will develop sustainable sourcing practices and promote the production of eco-friendly sports nutrition products.

Offer incentives for companies that adopt sustainable practices in their supply chains.

7. Promote the inclusion of plant-based and protein-rich sustainable food sources in athletes' diets.

Educate athletes on the benefits of plant-based nutrition for performance and recovery.

8. Public Awareness Campaigns

Launch public awareness campaigns to inform the general population about the environmental impact of dietary choices, including those related to sports nutrition. This can create a broader demand for sustainable food options.

9. Integration with Climate Goals

Align sustainable dietary guidelines for athletes with broader climate and environmental goals. Showcase the contribution of sports communities to larger sustainability efforts, emphasizing the role athletes play in promoting eco-friendly practices.

Invest in capacity-building programs for nutritionists, trainers, and coaches to enhance their understanding of sustainable nutrition. This can facilitate the effective implementation of sustainable dietary guidelines in the athletic community.

Implementing these policy recommendations requires a coordinated effort among governments, sports organizations, the food industry, and the broader community. Regular assessments and adjustments should be made to ensure the continued effectiveness of sustainable dietary guidelines for athletes within National Dietary Guidelines.