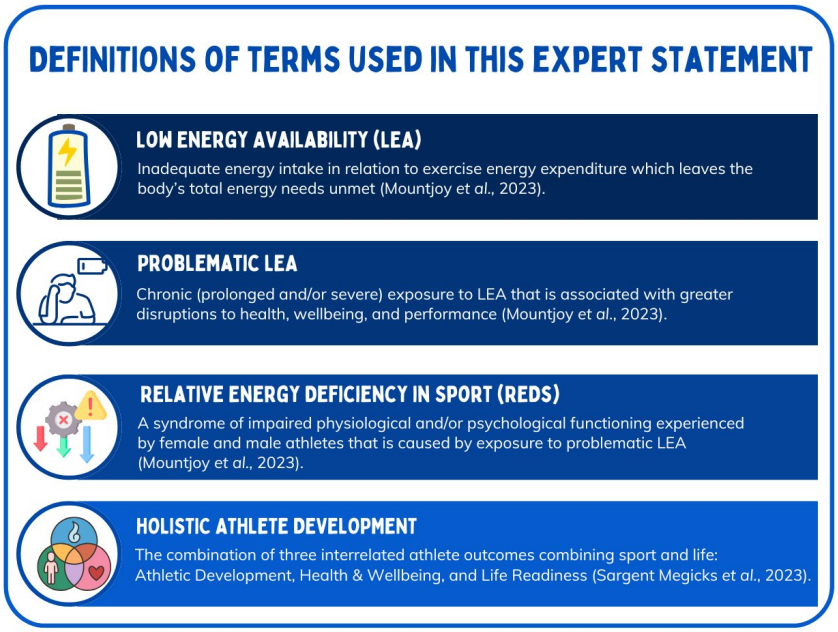
BASES EXPERT STATEMENT

THE BASES EXPERT STATEMENT ON USING A BEHAVIOURAL APPROACH TO PREVENT PROBLEMATIC LOW ENERGY AVAILABILITY (LEA)/RELATIVE ENERGY DEFICIENCY IN SPORT (REDS)

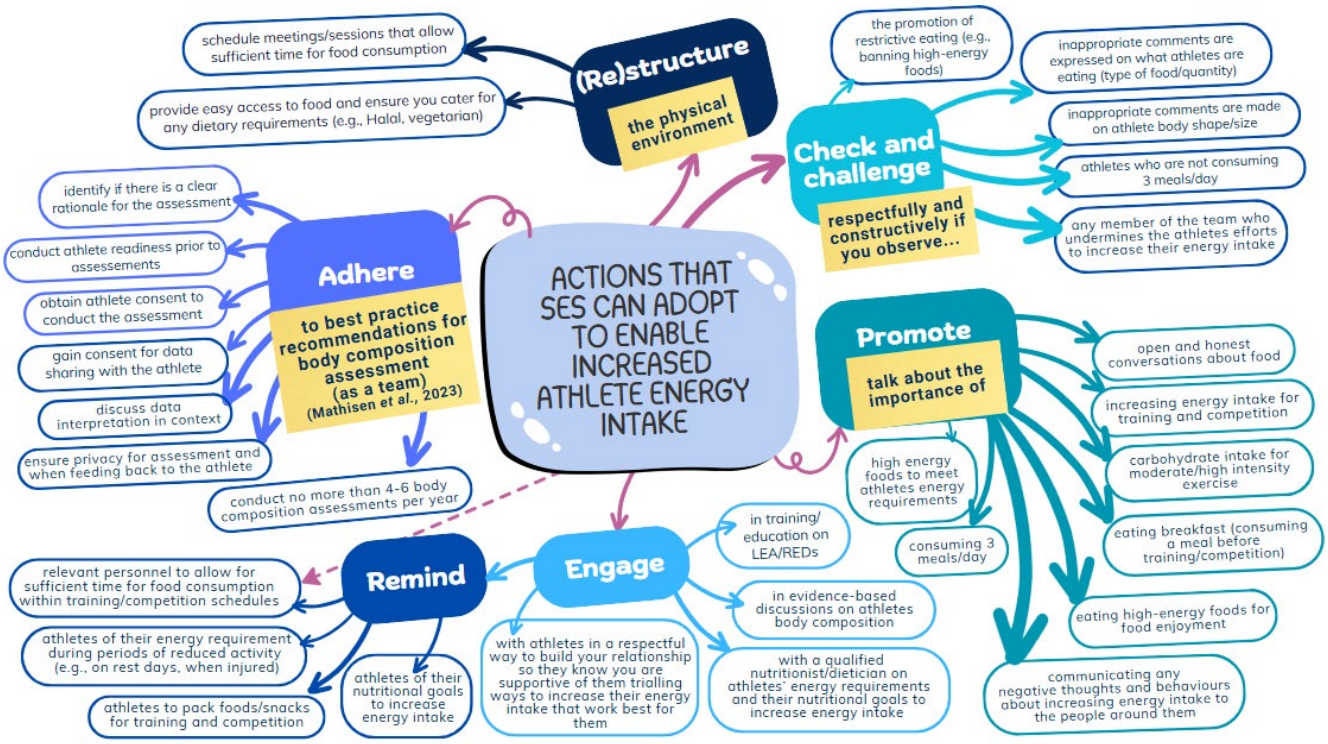
Produced on behalf of the British Association of Sport and Exercise Science by Dr Meghan Bentley, Prof Susan Backhouse FBASES, Kathryn Brown, Dr Lindsay Macnaughton, and Dr Laurie Patterson.

Problematic Low Energy Availability (LEA)* and Relative Energy Deficiency in Sport (REDs)* are threats to athlete health, wellbeing, and performance (*see Figure 1 for definitions). The prevalence of LEA/REDs in athletes ranges from 23% – 80% (females) and 15% – 70% (males) (Mountjoy *et al.*, 2023). Whilst scientific advances in LEA/REDs have strengthened understanding of how to identify, detect, and treat LEA/REDs (Mountjoy *et al.*, 2023), shifting focus upstream to preventing LEA/REDs is warranted.

Prevention is underpinned by the behavioural and social sciences, which help us understand the cognitive, social, and environmental enablers and barriers of human behaviour. For example, how we develop protective behaviours (e.g., increasing athletes' energy intake), whilst reducing potentially harmful behaviours



▲ **Figure 1:** Key term definitions



▲ **Figure 2:** An illustrative map of the actions SES can adopt to enable increased athlete energy intake. Please note this is not an exhaustive list of behaviours, but we hope it will serve as a stimulus to raise awareness and encourage self-reflexivity.

(e.g., banning high energy-foods) in sporting environments. Additionally, the health and performance team supporting athletes are preventive agents as their behaviours influence sporting cultures and environments. This influence is acknowledged in the International Olympic Committee (IOC) Consensus Statement on LEA/REDs (Mountjoy *et al.*, 2023).

The purpose of this Expert Statement is to focus attention on the behaviours of the Sport and Exercise Scientist (SES). Specifically, how they can enable increased athlete energy intake to prevent REDs, and subsequently, protect athlete health and wellbeing, and optimise performance. Whilst we recognise there are multiple behaviours which can address LEA/REDs, this statement focuses on increasing athletes' energy intake. Therefore, this expert statement aims to:

1. Raise awareness of the role of the SES in preventing problematic LEA/REDs;
2. Identify actions that SES can adopt to enable increased athlete energy intake;
3. Integrate a theoretical framework to guide SES on the factors that enable increased athlete energy intake.

FOOD RELATED BEHAVIOURS IN PREVENTING PROBLEMATIC LEA/REDS

Problematic LEA is one of the underlying causes of REDs. Ensuring athletes' energy intake is sufficient to sustain physiological function and support exercise energy expenditure will help prevent LEA (Torstveit *et al.*, 2023). However, athletes' energy and carbohydrate intake are frequently reported as inadequate (Jenner *et al.*, 2019) and the prevalence of disordered eating and eating disorders in athletes ranges from 0-19% (males) and 6-45% (females) (Bratland-Sanda *et al.*, 2013). The behaviours driving such disorders can manifest unintentionally (e.g. lack of knowledge), and intentionally. Restrictive eating is often associated with concerns around body weight and shape (Torstveit *et al.*, 2023). Negative comments and weight pressure can reinforce body dissatisfaction, subsequently enabling restrictive eating behaviour (Torstveit *et al.*, 2023). To prevent problematic LEA, and development of REDs, there is a need to de-emphasise weight and leanness within sporting practice, and instead enable athletes' increased energy intake to meet energy requirements. This is of particular importance given 78% of practitioners reported concerns with the focus on body composition within their sport (Mathisen *et al.*, 2023).

THE ROLE OF SPORT AND EXERCISE SCIENTISTS (SES) IN PROBLEMATIC LEA/REDS PREVENTION

Behaviours that can prevent LEA/REDs are not solely confined to athletes (Moutnjoy *et al.*, 2023; Torstveit *et al.*, 2023). SES play an important role as cultural architects and social reinforcers with the opportunity to enable increased athlete energy intake (Torstveit *et al.*, 2023). Whilst it can be challenging for SES to deliver a service that balances holistic athlete development* (Sargent Megicks *et al.*, 2023) (* for definition, see Figure 1) with performance expectations, it is imperative that SES work together to safeguard athletes from abuse or harm. Consequently, we ask SES to show openness to examining, and perhaps challenging, their own and others' behaviour that may support or prevent an increase in athletes' energy intake. To foster this openness, SES are encouraged to engage in reflective practice, to better understand 1) why SES do what they do? 2) the implications of what they do, and 3) how SES might change what they do to increase athletes' energy intake? Our experiences have highlighted the challenges of reflective practice including a risk that existing cultural norms are

perpetuated. Thus, we encourage SES to deepen their questioning to include 4) how have SES pre-existing values influenced the cultural norms? and 5) how have the cultural practices influenced the SES?

PREVENTING PROBLEMATIC LEA/REDS USING THE SOCIAL AND BEHAVIOURAL SCIENCES

Behavioural science is the systematic study of human behaviour and to fully understand athletes' dietary behaviour and experiences, we must understand the cultures and environments in which an athlete exists to reduce their risk of developing LEA/REDs. The norms and practices that prevail in high-performance sport environments may hinder the opportunity and motivation of athletes to increase their energy intake. Specifically, athletes report experiencing sociocultural pressures, such as the emphasis on performance and the 'slim to win' narrative (McMahon *et al.*, 2017). Concurrently, coaching staff enact misconceptions of food and body weight which are internalised by athletes as they adopt restrictive eating, to regulate emotions and maintain their athletic identity (Bentley *et al.*, 2021). These observations call for the need to broaden researchers' and practitioners' perspectives when exploring the underlying mechanisms which perpetuate athletes' restrictive eating, and identification of prevention strategies enabling athletes' increased energy intake.

Behavioural science offers an important contribution to the sport and exercise sciences as it enables the identification of target behaviour(s) (i.e., enabling increased athlete energy intake) to lessen the likelihood of LEA/REDs development (i.e., prior to clinical diagnosis or treatment). Figure 2 provides an illustrative map of some actions SES can adopt to enable increased athlete energy intake. Alongside the identification of target behaviour(s), behavioural theory helps multidisciplinary teams understand the barriers and enablers of the target behaviour so culturally informed strategies can be developed.

The capability, opportunity, and motivation model of Behaviour (COM-B) (the hub of the Behaviour Change Wheel (Michie *et al.*, 2011)) posits to enable increased athlete energy intake, SES must have the psychological and physical capability (C), social and physical opportunity (O), the automatic and reflective motivation (M). Table 1 provides an overview and definition of each domain of the COM-B model and Theoretical Domains Framework (TDF) (Cane *et al.*, 2012) with example questions. SES are encouraged to reflect upon each domain to identify what needs to change to enable them to increase athletes' energy intake. We recognise enabling increased athlete energy intake can be difficult for some SES, especially where maladaptive cultural norms are embedded within an organisation. We hope this expert statement encourages SES to think carefully about the complexity of LEA/REDs and prompts teams to come together to reflect on where change is possible.

CONCLUSION AND RECOMMENDATIONS

Preventing problematic LEA/REDs is the collective responsibility of all SES. SES are well positioned to affect change in athletes' energy intake through the creation of safe and supportive environments. Specifically, SES should promote, remind, adhere, and check and challenge their own and others' behaviour to enable increased athlete energy intake. To equip SES to enact these behaviours, they must have learning opportunities and organisational support to develop their capability, opportunity, and motivation to enable athletes' increased energy intake. We recognise further research is required to evaluate the effectiveness of SES adopting the approach outlined in this Expert Statement to enable increased athlete energy intake. However, until this is available, we hope this Expert Statement raises awareness of the role the SES in preventing problematic LEA/REDs and gives practical tools to guide personal reflection, peer discussion, and action(s) that seek to reduce the prevalence of problematic LEA/REDs and protect athlete health, wellbeing, and performance. ■

▼ **Table 1:** Guided by the COM-B model and TDF, a framework of the factors that need to be in place for SES to enable increased athlete energy intake, including reflective questions for the SES (adapted from, (9, 10) with permission).

COM-B COMPONENT	TDF DOMAIN	DEFINITIONS	RELEVANT QUESTIONS RELATED TO SES ENABLING INCREASED ATHLETE ENERGY INTAKE
Capability (Psychological or physical)	Knowledge	An awareness of the existence of something	Do you know the importance of sufficient energy intake for health, wellbeing, and performance? Do you know how to enable increased athlete energy intake?
	Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions	Do you monitor when you are enabling increased athlete energy intake?
	Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment, and choose between two or more alternatives	Do you remember to enable increased athlete energy intake when there are distractions in your environment (e.g., during congested competition and training camp schedules)?
	Psychological skills	An ability or proficiency acquired through practice	Do you have the interpersonal skills to a) talk to athletes about increasing their energy intake, and b) constructively and respectfully check and challenge colleagues who are promoting unsafe behaviours (e.g., banning high-energy foods and not adhering to the IOC best practice on body composition assessments (Mathisen *et al.*, 2023)?
	Physical skills	An ability or proficiency acquired through practice	Are you able to physically execute enabling increased athlete energy intake?
Opportunity (Social or physical)	Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours	Do the people around you (e.g., colleagues and/or significant others (i.e., friends/family) talk about the importance of enabling increased athlete energy intake? Do people around you (e.g., coaches, other SES) enable increased athlete energy intake?
	Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	Do you have access to necessary resources to enable increased athlete energy intake? (e.g., training and education on LEA/REDs, access to qualified nutritionist/dietitian, and organisational policies for LEA/REDs and body composition assessments).
Motivation (Automatic or reflective)	Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use	How confident are you in your ability to enable increased athlete energy intake?
	Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	Do you believe enabling increased athlete energy intake will optimise athlete health, wellbeing, and performance?
	Professional/social role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	Do you believe enabling increased athlete energy intake is an important part of your personal and professional identity? Do you think of yourself as someone who should enable increased athlete energy intake?
	Emotions	A complex reaction pattern involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event	Do you have a positive or negative emotional response(s) when thinking about enabling increased athlete energy intake?
	Goals	Mental representations of outcomes or end states that an individual wants to achieve	What goal(s) are you working towards in relation to enabling increased athlete energy intake? Are you experiencing any competing goals that impact on enabling increased athlete energy intake?
	Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way	Do you intend to enable increased athlete energy intake?
	Optimism	The confidence that things will happen for the best or that desired goals will be attained	Do you feel confident that enabling increased athlete energy intake will help you achieve your personal and professional goals? Do you feel confident that enabling increased athlete energy intake will prevent LEA/REDs?
	Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus	Have you established habits and routines that allow you to enable increased athlete energy intake? Do you experience any incentives to enable increased athlete energy intake?

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