

LOW ENERGY AVAILABILITY

Athlete Information Sheet

What is Low Energy Availability?

When the energy (calories) we consume from food and drink is not enough to match the needs of exercise and everyday living, the body runs at an 'energy' deficit. If this deficit is severe and lasts long enough it can lead to a situation known as low energy availability (LEA).

LEA forces the body's systems to adapt to the lower energy levels, which compromises and reduces the energy available to the body for key functions such as bone health, reproduction, and immunity. Ultimately, this increases the risk of multiple health problems.

LEA is formally defined as having "limited energy available to support the normal body functions, once the energy expended through exercise is subtracted from the total dietary energy intake."

Risk Factors of LEA

LEA is more common in individuals who participate in sports:

- That are endurance based (e.g. Triathlon, distance running)
- Where lean or light body types are often considered good for performance (e.g. cycling, running, rowing, gymnastics)
- Where a weight category is implemented for competition (e.g. light-weight rowing, weightlifting, combat sports).

However, LEA can occur with any body type, at any body mass and in both men and women. Any individual exercising is at risk of developing LEA.



How does LEA start?

In many athletes, LEA is the result of accidentally not meeting the energy needs of their sport, exercise activity or daily life. Athletes may find themselves to have LEA due to a lack of knowledge or understanding of nutrition, being influenced by eating habits of others or other social factors such as dietary trends or social media.

This accidental LEA may be due to:

- An increase in training volume and/or intensity without increasing dietary energy intake
- Lack of time or thought for food preparation/organisation
- Eliminating foods/food groups

LEA can also result from 'disordered eating behaviours' or formal 'eating disorders' which may cause significant health concerns. This may include excessive 'calorie (energy) counting', skipping meals, bingeing or purging (vomiting), deliberately changing eating patterns to achieve a certain look, or using medications to cause weight loss without medical advice.

Common signs of LEA

Frequent or repeated illnesses (e.g. coughs, colds, skin infections, stomach bugs)

- Recurring injuries that do not get better (e.g. stress fractures)
- Tired, sluggish, not recovering from training
- Absent or irregular menstrual periods
- Poor concentration, reduced interest, low mood
- Under performing in training and competition

LEA is not always accompanied by weight loss. The body has amazing tricks to conserve energy for survival and can maintain overall body weight even when there is not enough energy. One method is shutting down 'non-vital' body systems such as the menstrual cycle (see HPSNZ menstrual cycle information sheet for more details). As a result, weight on its own is not a great guide to the presence or absence of LEA.

What is relative energy deficiency in sport (RED-S)?

Relative energy deficiency in sport is a syndrome that impairs the physiological function of athlete's bodies and that can result in many negative health and performance outcomes. RED-S is caused by LEA. For further information on RED-S, see the HPSNZ RED-S Information Sheet.

For further information:

Speak with your HPSNZ Medical, Nutrition or Physiology Team

How to prevent LEA

1. To prevent LEA a diet should provide enough energy to support the demands of exercise and life – this allows for optimal health, training adaptation, recovery, and performance.
2. If there is an increase in training volume or intensity, energy intake should also increase to match the increase in energy expenditure.
3. Understanding the energy value of food and the demands of exercise helps ensure athletes have a healthy approach to energy requirements.
4. Be cautious of information and trends on social and mainstream media.
5. Utilise HPSNZ nutrition, physiology and medical experts for support and advice around energy availability.

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