

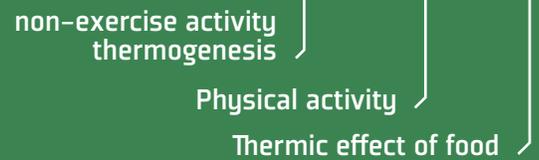
ESTIMATING RESTING ENERGY EXPENDITURE IN ADOLESCENT ATHLETES

Resting Energy Expenditure (REE) is the amount of energy the body needs to function while at rest.

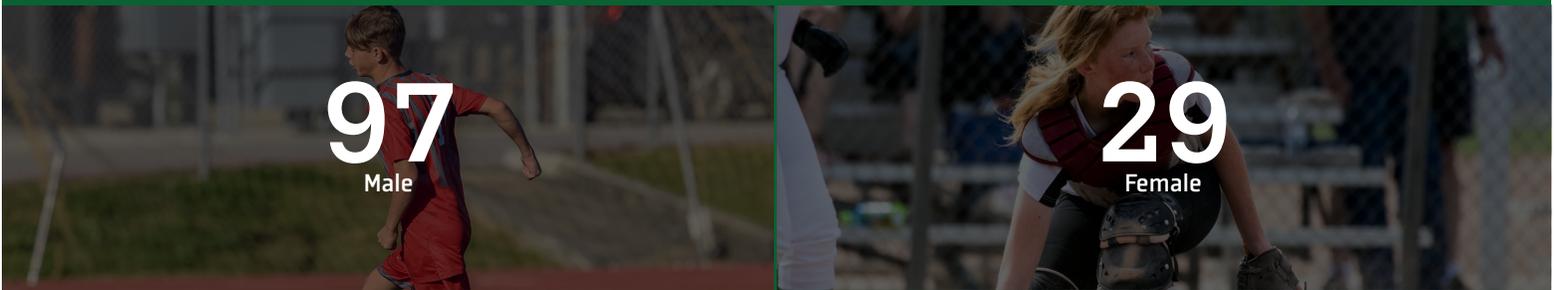
In other words, REE is the total number of calories someone burns per day, NOT including physical activity.

In adolescent athletes, the calories expended as part of REE also contribute to normal growth and development.

Breakdown of Total Energy Expenditure



WE MEASURED REE IN 126 ATHLETES ACROSS 8 SPORTS



WE FOUND THAT THE AVERAGE MEASURED RESTING METABOLIC RATE (RMR) FOR MALES AND FEMALES WERE:



Most existing prediction equations underestimate RMR in adolescent athletes. New one- and two-compartment model equations were developed and validated to more accurately estimate REE (r^2 of 0.83).

One Compartment Model

- **RMR (male)**
= $11.1 \times \text{BM (kg)} + 8.4 \times \text{height (cm)} - 340$
- **RMR (female)**
= $11.1 \times \text{BM (kg)} + 8.4 \times \text{height (cm)} - 537$

While both are valid and reliable, the one compartment was slightly more accurate and does not require the collection of body composition measures.



SUPPORTING ADEQUATE ENERGY INTAKE IN ADOLESCENT ATHLETES

For practitioners, calculating (or measuring) the resting energy needs of an adolescent athlete can help set a baseline for education and can highlight that **even without exercise, adolescent athletes have high energy demands.** Emphasize that any exercise or activity the athlete does throughout the day increases their energy expenditure, which in turn increases the total amount of energy (calories) they need to consume.

PRACTITIONERS SHOULD ENCOURAGE THEIR ATHLETES TO DO THE FOLLOWING TO HELP THEM MEET THEIR TOTAL ENERGY NEEDS:



Eat a meal or snack every 2-3 hours, including breakfast.



Balance macronutrients appropriately to meet total energy needs.

- Carbohydrate
- Protein
- Fat



If the athlete is having weight management issues, it is important to work with a multidisciplinary team to assess the reason:



A physician to assess medical issues



an RD to assess individual dietary needs



Reference: Reale R, Roberts TJ, Lee KA, Bonsignore JL, Anderson ML. (2020) Metabolic rate in adolescent athletes: the development and validation of new equations, and comparisons to previous models. *Int J Sport Nutr Exerc Metab.* 30(4):249-257.

