

LAY ABSTRACT

The overall goal of our study is to determine how daily energy (calorie) and calcium intake and expenditure relate to bone health in female high school distance runners. This study will be a collaboration between our research group at San Diego State University and Dr. Marta Van Loan from the Graduate Group in Nutritional Biology at UC Davis. In previous research, we and other investigators found that many adolescent female runners had lower bone mineral density (BMD) than expected for their age. This finding was somewhat unexpected, as weight-bearing or impact sports are often associated with stronger bones. Recent research indicates that female runners who either intentionally restrict calories to maintain low body weight, or who unintentionally do not eat sufficient calories to balance their high energy expenditure from training, may place themselves at risk for not building and strengthening their bones during the critical adolescent years when bone mineral accrual should be at its fastest rate of one's lifetime.

In the present study, we will measure food intake for seven continuous days using palm pilots to record everything the runners eat and drink. At the same time they will wear a small device called an Actiheart, which measures physical activity and caloric expenditure. We will also measure the amount of calcium the athletes' lose while sweating, by having them wear a small skin patch that collects minerals present in sweat. Participants will also have their BMD measured and learn how their bone health compares with other girls their age. We expect our study results will help researchers better understand the relationship between bone health and energy and calcium intake and expenditure in female high school distance runners. We hope our study participants will benefit from learning the importance of calorie and calcium intake for building strong bones during these critical adolescent years.