AIM: We investigated the effects of low load resistance training (RT) to failure performed with different rest intervals on hormonal responses, chronic muscle hypertrophy and strength gains.

METHODS:
Experiment 1: Participants were assigned to either a short rest (S, 30 s) or long rest (L, 150 s) RT protocol. Both groups performed 40% one-repetition maximum (1RM) RT to failure. Blood samples were taken before and after (0, 15, 30 and 60 min) workout. 
Experiment 2: Same RT protocol as experiment 1 was performed 2 times/week for 8 weeks.

RESULTS:
Experiment 1: Both groups showed significant (p < 0.05) increases compared to before values in growth hormone (GH), insulin-like growth factor 1 (IGF-1) and testosterone (T) immediately post workout. No significant differences could be observed among groups for each hormone.

Experiment 2: The S group’s triceps cross-sectional area (CSA) increased 9.8 ± 8.8% (p < 0.05) compared to 10.6 ± 9.6% (p < 0.05) for the L group. The thigh CSA changed 5.7 ± 4.7% (p < 0.05) in the S group compared to 8.3 ± 6.4% (p < 0.05) in the L group. No significant differences among groups could be observed. 1RM significantly increased for the bench press (S: 9.9 ± 6.9%, L: 6.5 ± 5.8%, p < 0.05) and back squat (S: 5.2 ± 6.7%, L: 5.4 ± 3.5%, p < 0.05).

CONCLUSION: We conclude that acute hormonal responses, chronic CSA and strength increases in low load RT to failure are independent of the rest interval length between sets.

Keywords: hormonal responses, cross-sectional area, one-repetition maximum, bench press, back squat