

IX Simposio Internacional de Actualizaciones en Entrenamiento  
de la Fuerza, Madrid 16-17 de Diciembre 2016

IX SIMPOSIO INTERNACIONAL DE ACTUALIZACIONES  
EN ENTRENAMIENTO DE LA FUERZA

*IX International Symposium in Strength Training*

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adaptations in human skeletal muscle and exercise performance.

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### 4.3 Comunicaciones Orales/Oral Presentations

#### Comunicaciones orales 1 / *Oral Presentations 1*

Viernes, 16 de diciembre / *Friday, December 16*

09:00 - 10:30 am

#### 1. Substrate oxidation in women during endurance exercise throughout menstrual cycle phases: IronFEMME pilot study

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**Background:** The contribution of fats and carbohydrates to the exercise energetic needs depends on several factors, including gender (Isacco et al., 2012, Vaiksaar et al., 2011b, Kraemer et al., 2013). This happens mostly due to the ovarian hormone natural fluctuations through menstrual cycle (Isacco et al., 2012).

**Objective:** To study the differences in substrate oxidation during exercise among different menstrual cycle phases in oral contraceptive users and eumenorrheic athletes.

**Methods:** Fifteen healthy endurance-trained women, eumenorrheic (n=9; 35± 4.3 years; 163±5.8 cm; 57.8±6kg; maximum oxygen consumption (VO<sub>2max</sub>) 50.9±3.7ml·min<sup>-1</sup>·kg<sup>-1</sup>) or oral contraceptives users (n=6; 28±3 years; 164±7 cm; 56.5±7 kg; VO<sub>2max</sub> 51.9 ±4.5 ml·min<sup>-1</sup>·kg<sup>-1</sup>) participated in the study. Each participant performed 40 min running at the speed corresponding to the 75% of VO<sub>2max</sub> previously determined. Exercise was completed on a treadmill and was performed in the different phases of menstrual cycle: early follicular (EFP), mid follicular (MFP) and luteal phase (LP) for the eumenorrheic women and hormonal phase (HP) and non-hormonal phase (NHP) in oral contraceptives users.

**Results:** There were no differences in the Respiratory Exchange Ratio (RER) among different menstrual cycle phases in women with regular cycle: RER values from min 35 to 40 were, at EFP 0.88, at MDP 0.84 and

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at LP 0.85 . As well as in women on oral contraceptives mean RER values during HP and NHP from min 35 to 40 were 0.87 and 0.89 respectively. There were no differences in the macronutrient oxidation among the different menstrual cycle phases 1.90 g CHO·min<sup>-1</sup> and 0.45 g fat·min<sup>-1</sup> at EFP, 1.60 g CHO·min<sup>-1</sup> and 0.55 g fat·min<sup>-1</sup> at MFP and 1.73 g CHO·min<sup>-1</sup> and 0.55 g fat·min<sup>-1</sup> at LP. Either in women on oral contraceptives 1.87 g CHO·min<sup>-1</sup> and 0.31 g fat·min<sup>-1</sup> at HP and 2.08 g CHO·min<sup>-1</sup> and 0.36 g fat·min<sup>-1</sup> at NHP.

**Conclusions:** Our preliminary results suggest that the different hormonal environments of each menstrual cycle phase do not significantly influence the energy metabolism in endurance-trained women.

**Practical application:** More research is needed to confirm these preliminary results, which suggest that the use of energy substrates is not modified by the action of sex hormones. Based on these data, any dietetic or training strategy for improve performance should be designed taking into account several circumstances such as the duration or intensity of the effort, but not the menstrual cycle phase.

**References:**

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