

Publication**Effects of follicular versus luteal phase-based strength training in young women****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 4479536**Author(s)** Sung, Eunsook; Han, Ahreum; Hinrichs, Timo; Vorgerd, Matthias; Manchado, Carmen; Platen, Petra**Author(s) at UniBasel** [Hinrichs, Timo](#) ;**Year** 2014**Title** Effects of follicular versus luteal phase-based strength training in young women**Journal** SpringerPlus**Volume** 3**Pages / Article-Number** 668

Hormonal variations during the menstrual cycle (MC) may influence trainability of strength. We investigated the effects of a follicular phase-based strength training (FT) on muscle strength, muscle volume and microscopic parameters, comparing it to a luteal phase-based training (LT). Eumenorrheic women without oral contraception (OC) (N = 20, age: 25.9 $\pm$ 4.5äyr, height: 164.2 $\pm$ 5.5äcm, weight: 60.6 $\pm$ 7.8äkg) completed strength training on a leg press for three MC, and 9 of them participated in muscle biopsies. One leg had eight training sessions in the follicular phases (FP) and only two sessions in the luteal phases (LP) for follicular phase-based training (FT), while the other leg had eight training sessions in LP and only two sessions in FP for luteal phase-based training (LT). Estradiol (E2), progesterone (P4), total testosterone (T), free testosterone (free T) and DHEA-s were analysed once during FP (around day 11) and once during LP (around day 25). Maximum isometric force (Fmax), muscle diameter (Mdm), muscle fibre composition (No), fibre diameter (Fdm) and cell nuclei-to-fibre ratio (N/F) were analysed before and after the training intervention. T and free T were higher in FP compared to LP prior to the training intervention (P < 0.05). The increase in Fmax after FT was higher compared to LT (P < 0.05). FT also showed a higher increase in Mdm than LT (P < 0.05). Moreover, we found significant increases in Fdm of fibre type and in N/F only after FT; however, there was no significant difference from LT. With regard to change in fibre composition, no differences were observed between FT and LT. FT showed a higher gain in muscle strength and muscle diameter than LT. As a result, we recommend that eumenorrheic females without OC should base the periodization of their strength training on their individual MC.

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