

# 國立臺中教育大學 106 學年度研究所碩士班招生考試

## 運動生理學試題

適用學系：體育學系碩士班（運動科學組）

一、寫出下列符號或英文簡寫的中文名稱：（每題 1%，共 15%）

- |                     |   |
|---------------------|---|
| 1. ADP              | 2. AMP  |
| 3. ATPase           | 4. PCr  |
| 5. $C_6H_{12}O_6$   | 6. $C_3H_6O_3$  |
| 7. FFA              | 8. TG   |
| 9. $\dot{V}O_2\max$ | 10. HRmax   |
| 11. $\dot{Q}$       | 12. $\dot{V}O_2 = (HR \times SV) \times a-v O_2 \text{ diff}$ |
| 13. RER             | 14. MET   |
| 15. 1 RM            |   |

二、將下列英文名詞翻譯成中文：（每題 2%，共 20%）

- |                           |                                |
|---------------------------|--------------------------------|
| 1. aerobic training       | 2. cardiorespiratory endurance |
| 3. concentric contraction | 4. fiber hypertrophy           |
| 5. overtraining           | 6. insulin                     |
| 7. fat mass               | 8. resistance training         |
| 9. type I fibers          | 10. strength                   |

三、簡答題（每題 5%，共 15%）

1. 何謂延遲性肌肉酸痛(delayed-onset muscle soreness, DOMS)? 在何種情況下較易發生?
2. 何謂肌肉幫浦作用(Muscle Pump)? 何謂動態休息? 這兩件事有何關聯性?
3. 何謂努責現象(Valsalva Maneuver)? 如何避免運動時發生?

（背面尚有試題）

四、閱讀下面文章之後回答以下問題：(50%)

- 1.寫出 ergogenic aid 的運動生理意義。(10%)
- 2.請寫出這篇研究的研究目的。(10%)
- 3.這篇研究的補充劑名稱為何？(5%)
- 4.請寫出補充劑補充時間、劑量。(5%)
- 5.這篇研究的運動挑戰為何？(10%)
- 6.這篇研究的結果發現為何？(10%)

**Oral conjugated linoleic acid supplementation enhanced glycogen resynthesis in exercised human skeletal muscle**

**Abstract**

Present study examined the effects of conjugated linoleic acid (CLA) supplementation on glycogen resynthesis in exercised human skeletal muscle. Twelve male participants completed a cross-over trial with CLA (3.8 g/day for 8 week) or placebo supplements by separation of 8 weeks. CLA is a mixture of trans-10 cis-12 and cis-9 trans-11 isomers (50:50). On experiment day, all participants performed 60-min cycling exercise at 75% VO<sub>2</sub> max, then consumed a carbohydrate meal immediately after exercise and recovered for 3 h. Biopsied muscle samples from vastus lateralis were obtained immediately (0 h) and 3 h following exercise. Simultaneously, blood and gaseous samples were collected for every 30 min during 3-h recovery. Results showed significantly increased muscle glycogen content with CLA after a single bout of exercise ( $P < 0.05$ ). Muscle glucose transporter type 4 expression was significantly elevated immediately after exercise, and this elevation was continued until 3 h after exercise in CLA trial. However, P-Akt/Akt ratio was not significantly altered, while glucose tolerance was impaired with CLA. Gaseous exchange data showed no beneficial effect of CLA on fat oxidation, instead lower non-esterified fatty acid and glycerol levels were found at 0 h. Our findings conclude that CLA supplementation can enhance the glycogen resynthesis rate in exercised human skeletal muscle.

**Keywords:** ergogenic aid, glycogen content, fat oxidation, exhaustive exercise