臺北市立大學

112 學年度碩士班考試入學筆試試題

系　　所：運動健康科學系碩士班

組　　別：不分組

科　　目：運動健康議題（運動健身指導、運動傷害防護、運動健康科學研發相關議題）

考試時間：90 分鐘【10：30－12：00】

總　　分：100 分

※ 不必抄題，作答時請將試題題號及答案**依照順序**寫在答卷上；限用藍色或黑色鋼筆或原子筆作答，用其他顏色或鉛筆作答者，所考科目以零分計。

※ **不得**使用計算機或任何儀具。

※ 於本試題紙上作答者，不予計分。

一、問答題（每題 25 分，共計 50 分）

（一）請自選一個運動項目，盡可能詳盡的說明該運動項目在訓練期及比賽期肌力體能訓練及疲勞恢復的策略及方法。

（二）活化後增益現象(Post-activation potentiation enhancement, PAPE)為運動健身課題對肌肉功能表現有效的生理機制，請就您所知盡可能詳盡說明活化後增益現象的原理、訓練介入方法與提升運動功能表現的方法。

二、文獻賞析（每題 25 分，共計 50 分）

（一）下面是一篇關於遲發性肌肉痠痛(Delayed onset muscle soreness, DOMS)的文章摘要，請以此篇文章的內容為基礎，說明運動員哪些時候或狀況容易發生 DOMS？DOMS 發生的機制可能為何？治療策略為何？運動員因應 DOMS 的訓練策略為何？

Delayed onset muscle soreness: treatment strategies and performance factors

Delayed onset muscle soreness (DOMS) is a familiar experience for the elite or novice athlete. Symptoms can range from muscle tenderness to severe debilitating pain. The mechanisms, treatment strategies, and impact on athletic performance remain uncertain, despite the high incidence of DOMS. DOMS is most prevalent at the beginning of the sporting season when athletes are returning to training following a period of reduced activity. DOMS is also common when athletes are first introduced to certain types of activities regardless of the time of year. Eccentric activities induce micro-injury at a greater frequency and severity than other types of muscle actions. The intensity and duration of exercise are also important factors in DOMS onset. Up to six hypothesised theories have been proposed for the mechanism of DOMS, namely: lactic acid, muscle spasm, connective tissue damage, muscle damage, inflammation and the enzyme efflux theories. However, an integration of two or more theories is likely to explain muscle soreness. DOMS can affect athletic performance by causing a reduction in joint range of motion, shock attenuation and peak torque. Alterations in muscle sequencing and recruitment patterns may also occur, causing unaccustomed stress to be placed on muscle ligaments and tendons. These compensatory mechanisms may increase the risk of further injury if a premature return to sport is attempted. A number of treatment strategies have been introduced to help alleviate the severity of DOMS and to restore the maximal function of the muscles as rapidly as possible. Nonsteroidal anti-inflammatory drugs have demonstrated dosage-dependent effects that may also be influenced by the time of administration. Similarly, massage has shown varying results that may be attributed to the time of massage application and the type of massage technique used. Cryotherapy, stretching, homeopathy, ultrasound and electrical current modalities have demonstrated no effect on the alleviation of muscle soreness or other DOMS

symptoms. Exercise is the most effective means of alleviating pain during DOMS, however the analgesic effect is also temporary. Athletes who must train on a daily basis should be encouraged to reduce the intensity and duration of exercise for 1-2 days following intense DOMS-inducing exercise. Alternatively, exercises targeting less affected body parts should be encouraged in order to allow the most affected muscle groups to recover. Eccentric exercises or novel activities should be introduced progressively over a period of 1 or 2 weeks at the beginning of, or during, the sporting season in order to reduce the level of physical impairment and/or training disruption. There are still many unanswered questions relating to DOMS, and many potential areas for future research.

（二）請仔細閱讀以下摘要短文，並於答案卷中以中文陳述此篇摘要之意涵。

A Sports Nutrition Perspective on the Impacts of Hypoxic High-Intensity Interval Training (HIIT) on Appetite Regulatory Mechanisms: A Narrative Review of the Current Evidence

High-intensity interval training (HIIT) and low-oxygen exposure may inhibit the secretion of appetite-stimulating hormones, suppress appetite, and inhibit dietary intake. Physiological changes affecting appetite are frequent and include appetite hormone (ghrelin, leptin, PYY, and GLP-1) effects and the subjective loss of appetite, resulting in nutritional deficiencies. This paper is a narrative review of the literature to verify the HIIT effect on appetite regulation mechanisms and discusses the possible relationship between appetite effects and the need for high-intensity exercise training in a hypoxic environment. We searched MEDLINE/PubMed and the Web of Science databases, as well as English articles (gray literature by Google Scholar for English articles) through Google Scholar, and the searched studies primarily focused

on the acute effects of exercise and hypoxic environmental factors on appetite, related hormones, and energy intake. In a general normoxic environment, regular exercise habits may have accustomed the athlete to intense training and, therefore, no changes occurred in their subjective appetite, but there is a significant effect on the appetite hormones. The higher the exercise intensity and the longer the duration, the more likely exercise is to cause exercise-induced appetite loss and changes in appetite hormones. It has not been clear whether performing HIIT in a hypoxic environment may interfere with the exerciser's diet or the nutritional supplement intake as it suppresses appetite, which, in turn, affects and interferes with the recovery efficiency after exercise. Although appetite-regulatory hormones, the subjective appetite, and energy intake may be affected by exercise, such as hypoxia or hypoxic exercise, we believe that energy intake should be the main observable indicator in future studies on environmental and exercise interventions.

文獻來源：Int J Environ Res Public Health, 19(3), 1736, 2022.