Nutrition concept for the football players

Football, also referred to like football, was an intermittent high-intensity team sport of skill and tactics that enjoys global popularity (Andrews & Itsiopoulos, 2016). Football was a game of strength, speed, and skill; all of which can be affected by what, when and how much an athlete eats and drinks. Athletes need to apply the same effort to proper fuelling as during practices and competition. Players sometimes neglect nutrition, which can result in poor performance. Proper nutrition was extremely important for football players because football requires short bursts of energy, eating enough carbohydrates were critical.

Foods that a player chooses will influence their ability to cope with these demands. It was also increasingly recognized that the brain plays a vital role in the fatigue process, and strategies that target this central fatigue can help sustain performance, especially in the later stages of the game when deterioration in function can affect the match outcome and also the risk of injury (Maughan, 2006). Current sports nutrition recommendations focus on periodizing energy, nutrient, and fluid intakes according to athletes' individual needs (Desbrow, McCormack, Burke, Cox, Fallon, Hislop, & Leveritt, 2014; FINA, 2014)

Football players can remain healthy, avoid injury and achieve their performance goals by adopting good dietary habits. Players should choose foods that support consistent, intensive training and optimize match performance. What a player eats and drinks in the days and hours before a game, as well as during the game itself, can influence the result by reducing the effects of fatigue and allowing players to make the most of their physical and tactical skills. Food and fluid consumed soon after a game and training can optimize recovery. All players should have a nutrition plan that takes account of individual needs (Maughan, 2006).

Football has been described as a stochastic, acyclical and intermittent aerobic event interspersed with periods of high-intensity activities (Bangsbo 2014). The total contribution of active play is typically 90 minutes suggesting that the primary energy source during the match (around 90%), is predominantly supplied via aerobic glycolysis (Stolen et al. 2005). Players must, therefore, possess sufficient aerobic and anaerobic capacity to sustain performance in, and quick recovery from, such intermittent and repeated bouts of high-intensity effort (Stolen et al. 2005). According to Bangsbo (2014), the researcher estimated the energy expenditure in a match to be in the region of sixteen kilocalories (kcal) per minute, corresponded to 1400 kcal for the entire duration of a 90-minute match. At the elite level, up to 2000 kcal could be expended throughout the total duration of a match (Bangsbo 2014).

Fatigue in football was defined as a decline in capacity to sustain muscular work, manifested as a reduction in work rate usually occurs towards the end of the match (Reilly et al., 2008). As the exercise intensity increases or the duration is prolonged, difficulty in supplying energy at the required rate may arise, and fatigue develops (Hargreaves 2000). At high standards of training and competitive play, players were known to experience observable fatigue which was indeed one of the major limiting factors in football performance, especially during the anaerobic phases of the match (Bangsbo et al., 2006).

Therefore, this study was carried out to investigate the dietary intake among football players.

The purpose of this article was to report on the dietary intake of male football players of Universiti Teknologi MARA Football Club (UiTM FC). The findings from this study would provide the overall nutrient intakes and recommendations for dietary improvement based on current food intake.

General Objectives

The main objectives of the study were to determine the dietary intakes of football player Universiti Teknologi MARA Football Club (UiTM FC).

The objectives of this Nutrient Intake analysis among football player Universiti Teknologi MARA Football Club (UiTM FC) were:

To analyze the nutrient intakes of a football player in Universiti Teknologi MARA Football Club (UiTM FC).

To evaluate and compare the nutrient intake of a football player in Universiti Teknologi MARA Football Club (UiTM FC) with Malaysian Recommended Nutrient Intake (RNI)

Participants

For this Nutrient Intake analysis study among Universiti Teknologi MARA Football Club (UiTM FC) football player, Diet Diary Record was used to record and to analyze the dietary intake of Universiti Teknologi MARA Football Club (UiTM FC) football player. This method was used by asking participants to take home and complete 3 days diet intake (consists of 2 days in weekdays and 1 day in the weekend) in Diet Diary Record.

Instruments

The Diet Diary booklet contained guidelines on how to records preparation of foods and its serving size, instructions on how to record participants diet intake, example of how to record diet intake, households measures and six-page to record food eaten during six time periods (breakfast, morning tea, lunch, afternoon tea, dinner and supper) for each three days. The instructions indicated that participants should record time, places where the food was prepared, types of food and drinks (including the brands), explanation on how the food was prepared (either fried, steam, roast and etc) and the portion size. In this study, we had distributed 30 sets of Diet Diary Record booklet and only 11 (37%) did return the diary. One Diet Diary Record booklet had been excluded due to insufficient data.

Data analysis

Nutrient analysis for this Diet Diary Record was carried out by using Diet Plus Software. The system’s database contains nutritional information 853 food items based on Nutrient Composition of Malaysian Foods. Nutrients used in this analysis were dietary energy, total carbohydrates, protein, fat, sugars, fiber, vitamin A, thiamin, riboflavin, niacin, vitamin C, calcium, Omega-6 polyunsaturated fatty acid (PUFA), Omega-3 polyunsaturated fatty acid (PUFA) and Trans fat.

Graphs below demonstrate the comparison between nutrient intake of Universiti Teknologi MARA Football Club (UiTM FC) player and Recommended Nutrient Intake (RNI). From analysis, the energy intake of football player were 16% more excess compared to recommended intake (2849 kcal ± 691.09) whereby majority of energy sources came from protein (118 g ± 32.67) which was 90% more consumption than what has been recommended and from fat (97g ± 38.99) which was 21% excess from RBI. Meanwhile, the carbohydrate (373g ± 92.67) consumption was 12% less compared to what has been recommended. The intake of refining sugar (150g ± 119.37) was 64% higher from the RBI. Moreover, the fiber intake (18g ± 4.4) were 40% less than the recommendation.

Graph 1: The comparison between UiTM FC macronutrient intakes with Recommended Nutrient Intake (RNI)

The micronutrient intake was includes calcium (848mg ± 248.89) which was 6% higher than RNI, Vitamin B1 (2mg ± 0.61) which was 67% higher than RNI, Vitamin B2 (2.7mg ± 0.85) 108% higher than RNI, Vitamin B3 (20mg ± 5.6) which was 25% higher than RNI, vitamin C (287mg ± 615.68) which was 310% higher than RNI, Vitamin A (1.04mg + 988.23) which was 73% higher than RNI.

Graph 2: The comparison between UiTM FC micronutrient intakes with Recommended Nutrient Intake (RNI)

The intake of Omega-6 (14g ± 8.67) was 26% less than RNI and Omega-3 (0.7g ± 0.86) was 79% less than RNI. Meanwhile, the intake for trans-fat (0.1g ± 0.15) was 96% less than RNI.

Graph 3: The comparison between UiTM FC fat intakes with Recommended Nutrient Intake (RNI)

Based on the data collected on macronutrient intakes, it shows the UiTM FC athletes' energy sources exceed the requirement set up by the Ministry of Health/ RBI. The specific macronutrient components which exceed the RBI guidelines taken by the athletes include protein, fat, and sugars. While data recorded on total carbohydrate and fiber intake shows that the athletes did not meet the requirement RNI guideline.

According to Williams et al., (2015) to optimize muscle glycogen levels, the contribution of diets with high carbohydrates content was encouraged. Few previous research shows that diets high in can optimize and improve football performance. Ali et al., (2007) and Foskett et al., (2008) had found that there were increased in sprinting and shooting performance from a player who ingested carbohydrate-electrolyte drinks. Meanwhile, Sougilis et al., (2013) had found that there was an increase of 1.3km total distance of player who consumed high carbohydrate diet. Burke et al., (2006) stated that when carbohydrate stores were inadequate to meet the energy needs for players' training requirements, a number of mental, physical, and technical parameters were at stake, jeopardizing training/playing capacity and the ability to continue a progressive training programme. This was mainly because if a low CHO diet was consumed, carbohydrates stores quickly become depleted and the muscles become unable to meet ATP requirements in support of the high-demands of football training and match-play (Bangsbo et al., 2006). Nonetheless, the low total carbohydrate intake may give result in a reduction of the circulating insulin level, which promotes a high level of circulating fatty acids, used for oxidation and production of ketone bodies. It was assumed that when carbohydrate availability was reduced in short-term to

a significant amount, the body will be stimulated to maximize fat oxidation for energy needs (Manninen, 2004). Adam-Perrot et al., (2006) reported that low-carbohydrate diets enhanced lean body mass loss, increased urinary calcium loss, increased plasma homocysteine levels, and increased low-density lipoprotein-cholesterol

Amino acids were a form of proteins building blocks of hormones and enzymes that regulate metabolism and other body functions (Wolfe, 2006). Protein also plays a key role in the adaptations that take place in response to training, including the repair and maintenance of body tissues to counter the increased rates of protein breakdown that normally occur during exercise, repair, and adaptation following the exercise stimulus (Lemon, 1994). Furthermore, the metabolism of amino acids also serves as a fuel source during extreme conditions such as starvation, when fats and glycogen stores are severely depleted (Williams 2012). Intake of small amounts (about 20 to 25 grams) of high-quality protein such as leucine during and after exercise, enhances protein synthesis and promotes the remodeling of muscle tissue that is an integral part of the process of adaptation to training (Maughan and Shirreffs 2007). Highton et al. (2013) stated that co-ingestion of protein and carbohydrate may also decrease the decrements of performance towards the end of a match to a greater magnitude than with carbohydrate ingestion alone. However high intake of protein had been implicated in chronic diseases such as osteoporosis, renal stones, renal insufficiency, cancer, heart disease and obesity (Miller et al., 2014). High protein intake can lead to an increase in urinary excretion of calcium. This can cause two potential harmful consequences which were a loss of bone calcium and increased risk of renal calcium stone formation (Miller et al., 2014). Although there had been studies indicating the increased reabsorption of bone with increasing protein intake, the available evidence was still weak to suggest limiting protein intake to avoid the potential risk of bone loss.

Fat is a necessary nutrient that assists in body functions including the preservation of body heat (via insulation), cushioning of vital organs, transportation and storage of fat-soluble vitamins, structural integrity of cell membranes and nerve fibres, and perhaps most importantly the provision of valuable energy storage and supply (Kreider et al. 2010). While fat was not the primary source of energy in football, it was necessary during the low-intensity periods of football training and match-play when the aerobic energy pathway especially during periods of rest, after high-intensity activities, during match-play or training (Bangsbo et al. (2006). However long-term consumption of a diet that was high in fat will result in a metabolic adaptation to favor fat oxidation at rest and during exercise of certain intensities. A high-fat diet can also result in ketosis; a process on which fats were broken down for energy in the absence of glucose from carbohydrates. Ketosis was a catabolic condition which quickly wastes the muscle and slows down body’s metabolism (White et al., 2007). The most critical risk of high-fat diets was heart disease. According to the American Heart Association (1961), a diet high in saturated fat can dramatically raise the cholesterol which increases the risk of developing heart disease.

Dietary intake of refined sugar had been alleged to contribute to a wide variety of health problems, including obesity, heart disease, diabetes, and cancer (Chiu et al., 2011). Habitual diet high-glycemic index foods theoretically may lead to insulin resistance and high triglyceride levels, which can be one of the risk factors to diabetes and heart disease respectively (Sacks et al., 2014). Added sugars can increase caloric intake and predispose to obesity. The National Academy of Sciences noted individual who consumes excess added sugar may not obtain sufficient amounts of various micronutrients, and this might lead to adverse health effects.

From the diet diary, the consumption of fruits and vegetables among Universiti Teknologi MARA Football Club (UiTM FC) football player were considerably low where according to Malaysian Dietary Guidelines 2010, Malaysian were recommended to take at least five servings of fruits and vegetables every day. It was recommended to take at least 3 serving of vegetables and at least two serving of fruits every day. Fruits and vegetables were also known for its good sources of dietary fibers, antioxidants, vitamins, and minerals and for a healthy population, it was not advisable to replace fruits and vegetables with supplements in order to meet the requirements of vitamins and minerals. Furthermore, overconsumption of vitamins may lead to hypervitaminosis, a condition where vitamins may change its function like drugs instead of nutrients which later than can induce toxic reactions. Hypervitaminosis occurs when overconsumption of vitamin supplements.

In conclusion, athletes need to consume energy that was adequate in amount and timing of intake during periods of high intensity and long duration training to maintain health and maximize training outcomes. Low energy availability can result in unwanted loss of muscle mass, sub-optimal bone density; an increased risk of fatigue, injury, and illness which impaired adaptation and a prolonged recovery process. Thus, the primary goal of the training diet was to provide nutritional support to allow the athletes to stay healthy and injury-free while maximizing the functional and metabolic adaptations to a periodized exercise program that prepares athletes to better achieve the performance demands of their event.

The limitation of this study was that even though athletes had achieved the requirement of diet intake, some of the athletes did not meet their nutrition goals. Common problems and challenges include poor knowledge of foods and drinks and inadequate cooking skills. Other than that, they were a poor choice when shopping or dining out especially travel for competition. Busy lifestyle will lead to inadequate time to obtain or consume appropriate foods. Thus, we conclude that poor in knowledge of nutrition intake and supervise from UiTM FC management may lead to inadequate nutrient intake of an athlete.