

Nutrition in fitness and sport

Sport & Tourism, Fitness



Introduction

\nIce hockey is characterized by high-intensity intermittent skating, rapid changes in velocity, lengthy duration and frequent body contact. The typical player performs for 15 to 20 minutes of a 60-minute game. Each shift lasts from 30 to 90 seconds with 4 to 4 minutes of recovery between shifts.\n

The intensity of a particular shift is determined by the duration and the extent of the contribution from aerobic to anaerobic energy systems by the player. In order to accommodate the body for these high-intensity bursts and length of activity, the player must develop muscle strength, power and anaerobic endurance in addition to a good aerobic system. Hockey players tend to have a mesomorphic structure and are relatively lean to positively influence their skating performance. For my nutrition analysis, I chose an adolescent female hockey player.

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As far as teenage athletes go, AC has already more than filled her resume with an abundance of accomplishments including a gold medal from the 2012 IIHF World Women's U18 Championship, the 2011 Tier 1 Under 19 U. S. National Championship, the 2010 Under 16 U. S. National Championship and the 2009 Atlantic Challenge Cup in addition to representing Team Nova Scotia at the 2011 Canada Winter Games. As a student at the private hockey prep school of Shattuck-St. Mary's in Faribault, Minnesota she is limited to a very specific selection of food on campus as she is a boarding student there.

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Female athletes are faced daily with the challenge of meeting the nutrient requirements for growth and development in addition to sports performance. Due to the wide range of physiological demands a large proportion of female athletes regularly do not meet DRI's for a number of macro and micronutrients some of which include vitamin D, folate, vitamin E and calcium. The current research illustrates the challenges that female athletes may face, otherwise known as the “female athlete triad” which include disordered eating, amenorrhea and osteoporosis.

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Furthermore, female teenage athletes have found to have relatively low energy intake and inadequate intakes of certain nutrients which are observed to improve seasonally in correspondence to their in-season and off-season, respectively. Assessment Part A: Objective Data AC is a 17-year-old female who is currently 68.95kg at 1.73m tall and has reported to have a 21% body fat composition, which equates to a normal BMI of 23. AC communicated the desire to cut weight to 65.7kg, which equates to a normal BMI of 22 by August 1st, 2012 in preparation for her next achievement of playing for Team Canada in the Olympics. In the patient's case, it would be more appropriate to use the body fat percentage to measure weight loss because the losses will be in body fat not lean body mass. Fortunately, in preparation for this event, AC is required to fill out a daily reflection including a food log, physical activity as defined by strength training, cardio and core exercise and personal reflection.

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Thus, from the data given to me, I have chosen to pick 3 weekdays and 3 weekend days to analyze. In summary, in-season she participates twice weekly with a strength training workout for approximately one hour and ice skating (practice) every day for approximately 1 hour and 15 minutes. As part of school extra circular activities, she incorporates basketball 3 times weekly for 45 minutes in addition to games once to twice weekly. During the off-season, she strives to maintain 4 days per week of strength training exercise, in addition to skating twice a week and running for approximately an hour each day.

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The raw data can be viewed in Appendix A. Part B: Analysis of the Data The analysis of AC's daily reflection reveals that as most female athletes she does not meet the required amount of energy for her physical activity level and body structure, but due to her current goal of losing weight, restricting calories while maintaining the recommended amount of servings as per Canada's Food Guide does not put her at risk for any of the symptoms of the female triad.

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AC's diet analysis reveals that although she is meeting her calcium requirement, other nutrients of concern as revealed by the literature review such as vitamin D, E and folate are not being met. AC is currently taking a multivitamin but was unable to describe in any detail in the interview type or contents (as her mother sends them too her from home) but the vitamin most likely supplies micronutrient needs. Furthermore, in most cases AC is

effective with meal timing, especially when you look at her inclusion of mid-morning snacks most days, which tend to be the days where a morning practice or working out is has occurred.

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In regards to AC's recommended food guide servings, as analyzed in appendix B, she meets her dairy servings all of the time, meat and alternative servings most of the time but only meets her fruit and vegetable and grain servings half some of the time. This further eliminates the risk of osteoporosis and protein losses, thus, the analysis should focus on grain servings to promote increased carbohydrate consumption and reaching daily servings of fruits and vegetables.

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If we calculate AC's carbohydrate (CHO) requirement as a recommendation based on body weight (per kg) and expressed as total grams per day considering her sport as intermittent high intensity she requires approximately 400g – 680g CHO/day. This amount can easily be adjusted daily in correspondence to the amount of exercise and energy level to accommodate weight loss. The average CHO intake was 246. 67g per day which equates to approximately 1000 Kcal per day but only nearly half of the recommended CHO consumption.

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As the role of protein is to build and repair tissue, consuming the recommended serving amounts is extremely important to protect herself

against the risk of protein losses. If we calculate AC's protein (PRO) requirement as a recommendation based on body weight (per kg) and expressed as total grams per day considering her sport as intermittent high intensity she requires approximately 89g – 103g PRO/day. To protect against protein losses and maintain existing muscle, timing of consumption becomes extremely important.

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After exercise protein sources should be consumed immediately after (stage 1) and within 2 hours after (stage 2) but should not exceed more than 1.6g/kg per day. The average PRO intake was 104g per day which equates to approximately 417.33 Kcal per day and exceeds her recommended protein intake slightly. As some dietary fat is essential to cell development and synthesis, and the recommended amounts range from 20-35% of the dietary energy intake are required.

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In comparison to her recommended range of fat intake as described by EatTracker, AC is not usually achieving her recommended amount of fat as her average fat intake was 42g per day which equates to approximately 378 Kcal, which is just less than 12% daily intake from fat. Lastly, fluids impact the regulation of body temperature, hydration and remove metabolic excretions which all improve athletic performance. Sweat rates and hydration level are affected by the duration, environmental temperature and intensity of the exercise the participant is engaged in, ergo, water needs are fairly diverse.

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As a regular participant in vigorous and enduring exercise AC's fluid recommendations would be fairly high. AC reported to consume at least one cup of water usually at every meal and drinks as much as 2L over the duration of any length of exercise. Nutrition Plan and Recommendations In regards to the literature review of typical female athlete concerns, AC is an ideal patient considering she does not show any symptoms of the female athlete triad and although weight loss is desired, she has determined an appropriate weight loss and time frame to achieve her goal by maintaining food guide recommendations while reducing energy intake.

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AC has described an appropriate goal of losing 3.18kg over 8 months (as the goal was acknowledged in January) to increase athletic performance and maintain good health by reducing body fat. To improve weight loss results AC should consume a number of small frequent meals that have a high proportion of CHO to maintain blood glucose levels and moderate protein levels to ensure adequate replacement of lean protein tissue. Although AC is typically meeting her Food Guide recommendations, she needs to ensure adequate energy intake of approximately 2700 Kcal/day and devise energy into 5-6 small meals every day.

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Some days she is just barely consuming 1200 Kcal which is not enough energy to keep her body strong and maintain muscle tissue when

considering the amount of physical demand on the body from the substantial amount of exercise. An energy reduction of 500 Kcal (2700kcal/day from 3200kcal/day) is appropriate to reduce weight by approximately 0.45kg (1lb) per week, reducing weight by approximately 3.6kg over 8 weeks. This gives the participant approximately 24 weeks to maintain and stabilize weight loss.

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As AC's physical activity participation is generally stable it is more appropriate to request stable and reduced energy intakes versus increasing physical activity duration. Further recommendations for AC would be to monitor weight changes during exercise to ensure adequate hydration status. Before exercise, increase fluid intake and reduce fat and fiber intake to facilitate gastric emptying and minimize GI upsets. During and after exercise consume fluids to replace sweat losses and maintain hydration status, which may include incorporating a sport drink to replenish water, carbohydrate and electrolyte levels.

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To increase consumption, ensure fluids are chilled to approximately 10 degrees Celsius. Advise that most liquids including milk, water, soup, 100% percent juices, and sports drinks all contribute to fluid intake recommendation. * I would advise AC to increase carbohydrate and fat intake by adding a carbohydrate-rich snack in the afternoon each day and increase fat of dairy products. A recommended meal plan using the 'Beyond the Basics' guidelines can be viewed in appendix G taking into consideration

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AC's limited food choices, EER, carbohydrate, protein and fat recommendations.

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References

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