NUTRITION FOR ATHLETES

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OBJECTIVES

- Review the role of nutrition in athletic performance & training
- Know macronutrient recommendations for athletes
- Define energy availability
- Recognize “nutritionally risky” athletes
Food Is Fuel
NUTRITION

- Not easy
  - Recommendations for athletes different than general public
  - Nutritional fads
- Individual
- Sport Dependent
- Goals
- Social aspect
NUTRITIONIST/DIETICIAN

- Experience w/ athletes is helpful
  - Other experiences: eating disorders, obesity, chronic diseases, etc

- Check credentials
  - Board certified sports dietitian

- Sports Medicine Team Member
  - Key member
WEB SITES/POSITION STANDS

❖ SCAN
  • www.scanpg.org
  • Look under Professional Resources
  • Great listing of information

❖ Nutrition and Athletic Performance Position Stand: American Dietetic Assoc, Dieticians of Canada & the American College of Sports Medicine
  J Am Diet Assoc 109-509-527; 2009
WHY IS NUTRITION IMPORTANT FOR ATHLETES?

- Energy intake to meet the demands of training
- Carbs to replenish muscle & liver glycogen stores
- Protein for tissue growth & repair
- Micronutrients, vitamins, calories to maintain a healthy immune system
- Hydration
BUILDING BLOCKS OF NUTRITION

- Carbs
- Protein
- Fat
- Micronutrients
  - Vitamins & Minerals
- Water
Carbohydrates

- Maintain blood sugar during exercise
- Need more carbs with...
  - Longer workouts w/ few rest days
  - Workouts > 1x/day
  - Multiple games/day
- Replenish glycogen stores used during exercise
- 6-10 g/kg/day (2.7-4.5 g/lb)
  - Need depends on sex, environment, intensity, duration, etc
PROTEIN

- Muscle maintenance, building & repair
- Maintain immune function
- Fluid balance
- Hormones
- Energy source
- Amount: 1-2 g/kg/d
  - Sport specific recommendations
PROTEIN INTAKE

- Recreational: 1-2 g/kg/d
- Endurance: 1.2-1.4
- Ultra-Endurance: 1.2-2.0
- Strength: 1.5-2.0
FATS

- **Energy**
  - Provides 70% of energy at rest

- **Essential fatty acids**

- **Fat soluble vitamins (A,D,E & K)**

- **Supports vital organs, myelin in nerves, cell membranes**

- **No evidence that high fat is performance enhancing**
FAT INTAKE

- <30% of daily calories from fat
  - Saturated fats
  - Unsaturated fats: mono & poly
  - <10% of daily calories from saturated

- Athletes: 1 g/kg/d
  - Endurance 2 g/kg/d
  - Ultra 2-3 g/kg/d
MICRONUTRIENTS

- Vitamins & minerals supplementation not needed if proper diet
  - Vitamin D may be an exception

- Do athletes need more than the recommended amounts?
  - ?
  - Iron ?
  - Calcium & Vit D?

- Other concerns in athletes
  - Zinc
  - B vitamins
  - Anti-oxidants: selenium, Vit C & E, beta carotene
EATING BEFORE EXERCISE/COMPETITION

- Fluids for hydration
- Familiar foods
- Low fat & fiber
  - Gastric emptying is improved
- Moderate protein
- High carbs
  - Maintain BS while exercising
  - 1-4 g/kg 1-4 hours prior
EATING DURING EXERCISE/COMPETITION

- Fluid replacement
- CHO for maintenance of BS especially...
  - Exercise >1 hr
  - Extreme conditions
  - Inadequate intake prior
  - Ingest q15-20 mins preferred
EATING POST EXERCISE/COMPETITION

- Provide fluids & energy
  - Replace muscle glycogen stores
  - Rapid recovery from training
  - Protein aids in muscle repair

- Consume recovery snack w/in 30 min of completing exercise
  - Then q2 hrs for 4-6 hrs
  - Carbs: 1.0-1.2 g/kg or approx. 0.5 g/lb
  - Protein: 0.1-0.2 g/kg/hr
  - Good choice: 1% chocolate milk
ENERGY AVAILABILITY = \frac{\text{Calories Consumed}}{\text{Calories Expended}} \div \text{FAT FREE MASS}
ENERGY AVAILABILITY

- **Energy Availability** = Dietary Energy Intake – Exercise Energy Expenditure
  Fat Free Mass

Example:

2000 kcal/d - 600 kcal/d ÷ 51 kg =
27.5 kcal/kg FFM per day
WHAT IS LOW EA?

- 45 kcal/kg of FFM per day = energy balance
  - Healthy, adequately nourished, sedentary, young adult females

- 30 kcal/kg of FFM per day
  - Near resting metabolic rate
  - 33% below energy balance
  - Disrupted LH pulsatility
  - Impaired bone turnover

Loucks et al; 2003 & 2004

• Amenorrheic athletes restrict EA by 44-67%
LH PULSATILITY

- LH pulsatility disrupted within 5 days after ↓ EA by 33% in young women
- Exercise suppression of LH pulsatility can be restored with ↑ calories alone
  - Exercise is not the culprit!
- Some women may be less susceptible to ↓ EA
  - Individual threshold

ACSM POSITION STANDS

1997

Disordered Eating
Amenorrhea  Osteoporosis

1997

Optimal Energy Availability
Optimal Bone Health

Eumenorrhea

Subclinical Menstrual Disorders

Low BMD

2007

Reduced Energy Availability with or without Disordered Eating

Low Energy Availability with or without an Eating Disorder

Functional Hypothalamic Amenorrhea

Osteoporosis

Nattiv A: The Female Athlete Triad Position Stand. MSSE 2007
FEMALE ATHLETE TRIAD COALITION

- Non-profit organization formed in 2002
- Represents key medical & athletic groups, & concerned individuals
- Promote optimal health & well-being for female athletes, active girls & women

www.femaleathletetriad.org
Variability of techniques to measure

No known ideal body fat % or weight
  - No valid scientific rationale
  - Body fat does not predict order of medal winners at the Olympics

Range of body fat % & weight
  - Sex, sport, genetics, age
WEIGHT & BODY COMPOSITION

- Frequent weigh-ins discouraged
  - May be the trigger for eating disorders

- If weights & body composition are monitored
  - Medical staff in charge of the results not the coaching staff

- If weight loss is needed
  - Start in off season
  - Work with a Dietician or Nutritionist
NUTRITIONALLY “RISKY” ATHLETES

- Vegetarians/Vegans
- Gluten free
- Trying to lose weight
- Chronic diseases
- Menstrual dysfunction
- Stress fractures
- Chronic injuries
- etc
Nutrition is critical for athletes
“Good nutrition” for athletes may not be the same as the public
  • Higher caloric needs
  • May need more micronutrient
  • Need fuel for recovery

Many medical complaints can have a root cause of inadequate nutrition

Athletes are not Nutritionists!
  • Seek out a Sports Nutritionist/Registered Dietician