An Overview of Collegiate Sport Nutrition

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Collegiate Sport Nutrition

- The university setting offers a unique opportunity to offer comprehensive sport nutrition assessment and educational services to athletes.
- EP’s and SN specialists can serve as a valuable member of a performance enhancement team.
Collegiate Sport Nutrition

*Overview*

- Performance enhancement team roles and opportunities
- Program design of an effective sport nutrition program
- General nutritional needs of college athletes
- Effective nutritional strategies that can be used to enhance training adaptations, promote weight gain, and/or assist college athletes in losing weight
- How to implement a comprehensive sport nutrition program in light of NCAA regulations and limited resources.
Performance Enhancement

**General Principles**

- Factors Affecting Performance
  - Genetics
  - Training
  - Diet
  - Adequate Rest & Recovery (Sleep)
  - Coaching
  - Game Preparation
  - Focus/Intensity
  - Execution
  - Optimal Recovery
Training Stimulus

- Optimal Training/Diet
- Overtraining/Inadequate Diet
- Undertraining/Poor Diet

Optimizing Performance

- Athletes must be well coached, scientifically trained, and prepared to perform to the best of their ability
- Sound nutrition is vital to optimizing performance
- Sport nutritionists have a unique opportunity to serve as a member of a performance enhancement team
Performance Enhancement Team

- Coaches
- Strength & Conditioning Coaches
- Athletic Trainers / Team Physicians
- Support Staff
  - Exercise Physiologists
  - Nutrition Specialists
  - Biomechanists
  - Sport Psychologists
  - Minister/Spiritual Advisor
Principles in Working with Coaches and Athletes

• Must provide practical, honest, and up to date information
• Must earn respect of players and coaches
• Must be available to provide support
• Must be interested in performance enhancement of players/teams not just research opportunities
Performance Enhancement Program Activities

- Consult with S&C coaches and AT’s about proper training and nutrition
- Provide general nutritional education to athletes for each sport
- Consult with S&C coaches about strength and body composition goals of individual athletes
- Provide weight management, eating disorder, and supplement counseling to athletes
- Provide body composition and performance assessment services
- Provide students to support S&C and AT programs
- Conduct applied research designed to optimize performance
- Serve as a resource about latest training and nutrition advances
Performance Enhancement Program Components

- Nutrition Program
- Performance Assessments
- Research Protocol Considerations
Performance Enhancement
Nutrition

• General Guidelines
  • Caloric and Macronutrient needs
  • Meal Timing
  • Hydration

• Nutritional Supplements
  • Weight Gain
  • Weight Loss
  • Ergogenic Nutrients
  • Education About Banned and/or Dangerous Supplements
Nutritional Guidelines

General

- Eat an isoenergetic diet to maintain weight
- **Carbohydrate** (55-65% of calories)
  - 5 – 8 g/kg/d during normal training
  - 8 – 10 g/kg/d during heavy training
- **Protein** (15-20% of calories)
  - 1.0 – 1.5 g/kg/d light training
  - 1.5 - 2.0 g/kg/d during heavy training
- **Fat** (25-30% of calories)
  - 0.5 – 1.5 g/kg/d
- Eat/snack 4-6 times a day
- **Make Good Food Choices** (whole grains/breads, pastas, vegetables, fruits, low-fat milk, non-fried foods, lean meats).
- Strength/Power athletes may be able to train well with lower carbohydrate intake (40-50%) and higher protein needs (20-30%)
Nutritional Guidelines

Strategic Eating / Meal Timing

- Pre-exercise meals (4-6 h)
- Pre-exercise snack (30-60 min)
- Sports Drinks During Exercise (> 60 min)
- CHO Gels/Bars at Half-time
- Post-exercise CHO/PRO drink/bar
- Post-exercise high CHO/PRO meal
- Scientifically-based safe & effective supplements
Fluid Intake Guidelines

- Drink 4-6 cups of water before leaving the dorm for practice.
- When arriving at practice, drink 1 cup of sports drinks and 1 cup of water.
- Drink as often as you can during practice.
- Do not depend on thirst to regulate fluid intake.
- Drink 2 - 4 cups of water or sports drinks every water break whether you are thirsty or not!
- You need to drink more fluid the hotter and more humid it is during practice.
- Drink a carbohydrate/protein shake or eat an energy bar after practice to optimize recovery.
Fluid Intake Guidelines

- Monitor pre and post-practice body weight to determine if an adequate amount of fluid was ingested.
- You should try not lose more than 2% of body weight (4-6 lbs) with each practice.
- Loss of 3% (6-9 lbs) or more may require medical attention.
- Drink 3 cups of sports drink and/or water for every 1 pound that you lost during practice.
- Add salt to your diet to improve fluid retention during exercise in the heat.
- Try to regain the majority of weight lost before the next practice.
Ergogenic Aid

Analysis

• Is there a scientific rationale?
• Is there any scientific evidence that the rationale may affect exercise?
• Is there any well-controlled data supporting the ergogenic value in athletes?
• Is it legal and safe?
Ergogenic Aids

Categories

I. **Effective/Safe** - Research clearly shows is effective & safe.

II. **Possibly Effective** - Good theoretical rationale and some preliminary evidence to support use.

III. **To Early to Tell** - Good theoretical rationale but insufficient research to support use at this time.

IV. **Apparently Ineffective** - Little scientific rationale and/or research indicates it is ineffective and/or dangerous.
Nutritional Ergogenic Aids

Apparently Effective

- Water/GES
- Carbohydrate
- Creatine
- Bicarbonate Loading
- Phosphate Loading
- Caffeine
Nutritional Ergogenic Aids

*Potentially Effective*

- Post-exercise CHO/PRO & EAA
- Glutamine
- BCAA
- Calcium β-HMB
- Glucosamine/Chondroitin
- Glycerol
Nutritional Ergogenic Aids

Too Early to Tell

- Antioxidants
- Arginine
- Colostrum
- CLA
- Calcium Pyruvate
- Chitosan
- MCT’s
- Phosphatidylserine
- Ribose
Nutritional Ergogenic Aids

Too Early to Tell

• $\alpha$-ketoglutarate
• $\alpha$-Ketoisocaproate
• Ecdysternones
• GHRP and Secretogues
• Isoflavones (e.g., methoxyisoflavone)
• Ornithine-$\alpha$-ketoglutarate
• Sulfo-polysaccharides (myostatin inhibitors)
• Zinc/Magnesium Aspartate
Nutritional Ergogenic Aids

Apparently Ineffective

- Inosine
- L-carnitine (fat loss)
- Boron
- Chromium
- Vanadium (Vanadyl Sulfate)
- Gamma Oryzanol (Ferulic Acid).
- Smilax Officinalis
- Tribulus Terrestris
- Prohormones
- Yohimbine (Yohimbe)
(c) Training-Table Meals.
- An institution may provide only one training-table meal per day to a student-athlete during the academic year on those days when regular institutional dining facilities are open; *(Adopted: 1/10/91 effective 8/1/96, Revised: 11/1/01 effective 8/1/02)*

(d) Meals Incidental to Participation.
- Student-athletes who are not receiving athletically related financial aid (e.g., walk-ons) may receive the benefit of a training-table meal during the permissible playing and practice season in those instances in which the student-athlete's schedule is affected by involvement in practice activities, provided the student-athlete previously has paid for the same meal (e.g., dinner) at an institutional dining facility. Further, all student-athletes are permitted to receive a pregame meal as a benefit incidental to participation and all student-athletes are permitted to receive meals at the institution's discretion from the time the student-athlete reports on call (at the direction of the student-athlete's coach or comparable authority) and becomes involved in competition-related activities to the end of competition and the release by the appropriate institutional authority. An institution, at its discretion, may provide cash, not to exceed $10, in lieu of a meal to student-athletes following home and away-from-home contests; *(Revised: 4/25/02, 4/29/04)*
g) Nutritional Supplements.

- An institution may provide only nonmuscle-building nutritional supplements to a student-athlete at any time for the purpose of providing additional calories and electrolytes, provided the supplements do not contain any NCAA banned substances. Permissible nonmuscle-building nutritional supplements are identified according to the following classes: Carbohydrate/electrolyte drinks, energy bars, carbohydrate boosters and vitamins and minerals. (Adopted: 4/27/00 effective 8/1/00, Revised: 11/1/01 effective 8/1/02)
NCAA Restrictions

Bylaw 16.5.2.2 – Permissible Nutritional Supplements
(Adopted: 4/27/00 effective 8/1/00, Revised: 11/1/01 effective 8/1/02)

• Nonpermissible
  – Amino acids
  – Chrysin
  – Condroitin
  – Creatine/creatine-containing compounds
  – Ginseng
  – Glucosamine
  – Glycerol
  – HMB
  – I-carnitin (sic)
  – Melatonin
  – Pos-2
  – Protein powders
  – Tribulus

http://www.ncaa.org/sports_sciences/education/nutritional_supplements.html
Supplements Containing Protein

... a supplement that contains **protein may be classified as a non-muscle-building supplement**, provided it meets all of the following conditions:

1. It is included in **one of the four permissible categories** set forth in 16.5.2.2;
2. It does not contain more than 30 percent of calories from protein (based solely on the package label); and
3. It does not contain additional ingredients that are designed to assist in the muscle-building process (see examples of nonpermissible supplements). ....The following are examples of this calculation:

   – Energy bar contains 24 grams of protein with a caloric value of 250. 24 grams times four = 96 calories. 96/250 = .384. Percentage of protein = **38 percent** -- as an example, this **energy bar would not be permissible**.
   – Energy bar contains 17 grams of protein with a caloric value of 250. 17 grams times four = 68 calories. 68/250 = .272. Percentage of protein = **27 percent** -- as an example, **this energy bar would be permissible**.
15.2.2.1.6 Training-Table Meals

- The cost of meals provided on the institution’s *training table shall be deducted from a student-athlete’s board allowance*, even if the student-athlete is not receiving a full grant-in-aid. In determining the cost figure to be deducted, the institution *may use the actual meal costs listed in the institution’s catalog or the average meal costs of its student-athletes living on campus*.

15.2.2.1.7 Game-Related Meals

- *The cost of meals provided for away-from-home practices and contests and pregame or postgame meals at home contests need not be deducted from a student-athlete’s board allowance*. Such meals also may be received by a student-athlete who is not receiving athletically related financial aid inasmuch as they constitute a benefit incidental to athletics participation.
13.3.2.2 Report Distribution. Effective Date: Aug 01, 2004

- Member institutions shall provide to all incoming prospects and to prospects' parents the **NCAA banned drug list**, or the NCAA Web site address at which the list is located, and **information about nutritional supplements** (See Bylaw 31.2.3.1). The information shall be provided at the earliest practical opportunity (e.g., after the institution's first arranged in-person encounter with the prospect) or upon request; however, in no event shall an institution provide the information later than July 1 before the prospect's initial enrollment at the institution. For a prospect whose recruitment is initiated after July 1, the institution must send the banned drug list and information about nutritional supplements at the earliest opportunity. Violations of this bylaw shall be considered institutional violations per Constitution 2.8.1; however, such violations shall not affect the prospective student-athlete's eligibility. *(Adopted: 4/29/04 effective 8/1/04)*

31.2.3.2 Medical Exceptions

- **Exceptions** for categories (a), (c), (d) and (f) under Bylaw 31.2.3.1 *may be made by the Executive Committee for those student-athletes with a documented medical history demonstrating the need for regular use of such a drug.* *(Revised: 8/5/99)*
NCAA Supplement Policy

• You will be provided supplements (vitamins, minerals, sports drinks, carbohydrate/protein bars, drinks, etc) that have been approved for provision by the NCAA at practice and/or in the weight room.
• Not all supplements sold over-the-counter are allowed to be taken by NCAA athletes. Some contain ingredients that will result in positive drug tests.
• There are some supplements the NCAA allows athletes to take but does not allow institutions to provide to their athletes.
• Report all supplements you take or are considering taking to athletic trainer.
Dealing with NCAA Supplement Restrictions

- Teams can provide one-meal per day of a training table
- Training tables/meal services can provide energy bars and other snacks to athletes to carry out
- Primary focus should be on good diet foundation and proper meal timing
- Unlimited use of “non-muscle building” supplements prior to, during, and after practices/games
- Athletes can purchase non-banned supplements on their own
- Recommend providing guidance on product purchases and/or supervision when taking non-banned “non-permissible” supplements
- ISSN should be active in providing accurate information to NCAA so that misinformed policies are not passed to the detriment of athletes
Performance Enhancement Nutrition Program

- Stress high CHO, nutrient dense, isoenergetic diet
- Daily multi-vitamin (with iron for women)
- Taper & CHO load before competition
- Pre-practice snack with compliant energy bars/drinks/shake
- Water and GES during exercise
- Post-practice snack with compliant energy bars/drinks/shake
- Evening snacks or compliant energy bar/shake
- Sport specific use of effective and non-banned ergogenic aids
Performance Enhancement Nutrition Program

- Strength/Power/Sprint Athletes
  - High CHO diet/CHO loading
  - Water/GES
  - Creatine*
  - Bicarbonate *
  - Sodium Phosphate *
  - Glycerol (dehydration) *

- Endurance Athletes
  - High CHO diet/CHO loading
  - Water/GES
  - Caffeine
  - Sodium Phosphate *
  - Glycerol *
  - Creatine *

* Must purchase on own
Performance Enhancement Nutrition Program

- Possible Anticatabolic Nutrients
  - Creatine *
  - HMB *
  - L-carnitine *
- Possible Immunoenhancing Nutrients
  - Vitamin C
  - Zinc
  - Glutamine *
  - Post-Exercise Protein *
  - Echinacea *

* Must purchase on own
Performance Assessments

- Nutritional Analysis
  - Dietary Records
  - Training Table
- Body Composition
- Cardiopulmonary Exercise Testing
  - ECG/VO₂ Max
  - VANT, LT
- Strength/Power Tests
  - Wingate AC Testing
  - Isotonic & Isokinetic Assessment
  - Field Testing
- Blood Analyses
- Scheduled at beginning of major changes in training/season
- Results shared with S&C coaches, AT’s, and/or team coaches
Research Considerations

- Must maintain good research methods but have a practical application
- Must provide usable information to coaches & athletes in a timely manner
- Should provide training, performance, or recruiting edge
- Should not interfere with training methods or performance schedule
- Must be voluntary for athletes
- Must be a win – win situation for coaches, athletes, and researchers
Advantages in Conducting Research on Athletic Teams

- Supportive coaching staff
- Captive, interested, and typically homogeneous subject population
- Controlled and supervised training
- Sports medicine staff allows for thorough medical monitoring
- Often eat at one location and have similar dietary patterns
- Ease in administering and supervising supplementation protocols
- Typically undergo a series of performance tests throughout the year
- Ease in collecting group data
Disadvantages in Conducting Research on Athletic Teams

- Not all of the coaching staff may support involvement of their players in a study.
- Gaining trust takes time.
- Sport organization limitations on supplements may limit the type of research you can perform.
- May not be able to ideally manipulate training variables or diet.
- Time and travel constraints often make it difficult to collect data.
- Often requires on-site field testing which may decrease reliability of testing methods.
- Subject attrition/compliance to protocol.
- Often need to “bring something to the table” for coaches and athletes to participate.
An Overview of Collegiate Sport Nutrition

Summary

• Despite NCAA restrictions, the university setting provides a unique opportunity to implement a comprehensive sport nutrition program.
• The EP and nutritionist can play an important role in optimizing performance of athletes.
• Primary avenues include exercise and nutrition education, performance assessment, and research.
• Care must be made to ensure compliance to NCAA policies/procedures.
• Development of a good relationships with coaches and athletes can enhance performance of athletes, educational opportunities for students, and research productivity.
• Universities should ensure that athletes are properly educated regarding sport nutrition.
Reaching the world through exercise, nutrition, and preventive health research!

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