

Trends in Nutrition: An Overview of Popular Diets and Supplements for Athletes

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Learning Objectives

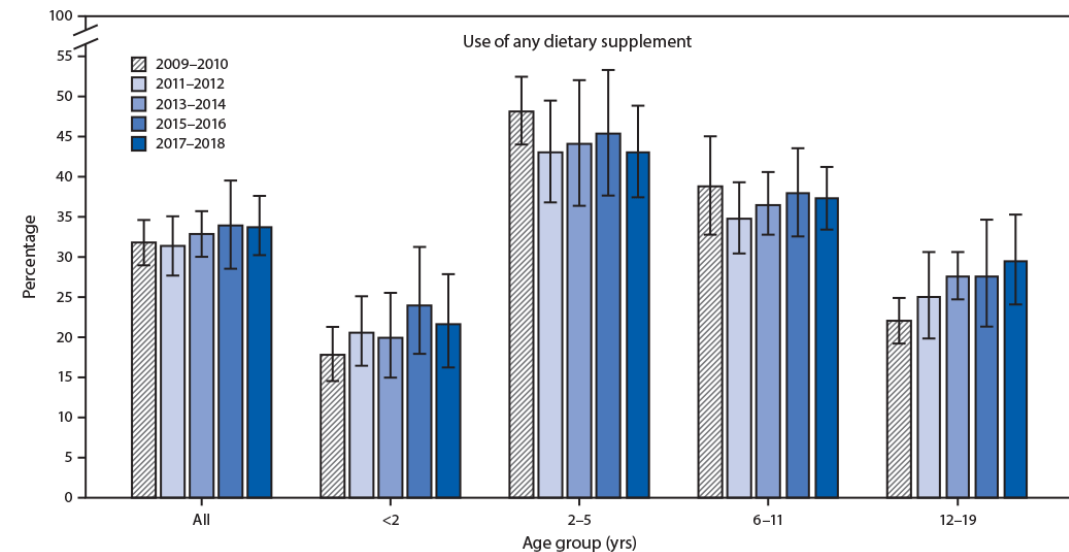
1. Outline popular supplements and diet strategies of interest to young athletes.
2. Discuss pros/cons of specific supplements and diets.
3. Review strategies for evaluating the quality of supplements available in the US.
4. Provide practical advice for young athletes seeking to gain muscle/energy and/or lose fat for sports performance.
5. Identify resources for individuals seeking continued sports nutrition guidance.



Dietary Supplement Usage in the US

- According to NHANES (2017-2018) data, nearly 58% of adults aged 20+ and **30% of adolescents** used at least one dietary supplement in the past 30 days
 - Prevalence in females exceeded that in males for all ages
 - Multivitamins, vitamin D, and omega-3 fatty acids were most common
- Dramatic increase in the number of dietary supplements sold in the US in past 25 years
 - 400 in 1994 vs. 90,000+ in 2014
 - Largely unregulated

FIGURE. Prevalence of use of any dietary supplement* and use of two or more dietary supplements*[†] in the past 30 days among children and adolescents aged ≤19 years, by age group — United States, 2009–2010 to 2017–2018



Dietary Supplements Defined

- Dietary supplements include a large group of products intended to supplement the diet that are not better described as drugs, foods, or food additives. These may include:
 - Sports performance products
 - Weight loss aids
 - Protein powders
 - Herbal remedies(Dietary Supplement Health and Education Act of 1994)
- Regulated by FDA
 - Need only to meet limited safety standards (via voluntary reporting mechanism)
 - Not evaluated for efficacy
 - Can be marketed at any concentration as long as DV is listed on label
 - Burden of proving a product is unsafe lies on FDA



Nutritional Ergogenic Aids

- “Substances that can enhance performance and are either nutrients, metabolic by-products of nutrients, food (plant) extracts, or substances commonly found in foods that are provided in amounts more concentrated than commonly found in the natural food supply.” –*Advanced Sports Nutrition*, 2nd ed. (2012)
- Relatively few dietary supplements provide performance benefits beyond what would be achieved with a balanced diet
 - E.g., protein powder supplement provides benefit not necessarily due to additional protein but because of additional kcal for an athlete who is under-eating for activity level

Popular Supplements Among Athletes: Creatine

- **Claims:**
 - ↑ muscular creatine content for quick, explosive movements
 - ↑ training capacity in strength and power activities
 - ↑ lean body mass and strength when combined with resistance training
- **Risks and Challenges:**
 - Some individuals do not experience any performance benefit
 - GI distress, cramps, and bloating
 - Causes weight gain r/t increases in lean body mass and total body water
 - Limited data available for safety and efficacy in adolescents
 - Adverse events are rare
- **Dose:** 3-5 grams per day, beginning about 1 month prior to competition

Source	Serving Size	Creatine Content (g)
Pork	3 oz.	0.43
Beef	3 oz.	0.38
Salmon	3 oz.	0.38
Tuna	3 oz.	0.34
Creatine Monohydrate Supplement	1 serving	5*

* Typical for most products

Popular Supplements Among Athletes: Caffeine

- **Claims:**

- ↑ endurance performance (in athletes unaccustomed to caffeine intake)
- ↓ pain
- Delay fatigue

- **Risks and Challenges:**

- Anxiety, tremor, ↑ heart rate, insomnia
- GI distress
- Banned in high amounts by NCAA (>15ug/mL in urine)
- Should not be taken in combination with depressants or other stimulants

- **Dose:** 2-3mg/kg; maximum is 6mg/kg

- Not recommended for those under 12 years
- For those aged 13-18 years: < 100mg/d



Popular Supplements Among Athletes: Fish Oil

- **Claims:**

- ↑ delivery of oxygen and nutrients to muscles
- ↑ release of human growth hormone
- ↓ inflammation and muscle soreness for faster recovery
- Improved recovery in concussions

- **Risks and Challenges:**

- May have different effects on trained vs. untrained athletes
- Potential for drug-nutrient interactions

- **Dose:**

- EPA:DHA 2:1; 2-4g/d. Higher doses indicated for concussion recovery benefits



Popular Supplements Among Athletes: Protein

- **Claims:**
 - Enhance muscle growth
 - ↑ muscle repair following activity
 - May facilitate weight loss for athletes aiming to lose fat
 - Match intake to increased needs in young athletes
- **Risks and Challenges:**
 - Lack variety of nutrients present in whole protein foods
 - May contain added sugars, unnecessary additives
 - Excess intake may increase risk of dehydration
 - Protein quality should be considered
- **Dose:**
 - Endurance: 1.2g to 1.4g/kg
 - Strength: 1.6 to 1.7g/kg
 - Up to 2.0g/kg

Weight	Grams of protein/day
150 LBS (68.2 kg)	80-135 g/day
200 LBS (90.9 kg)	110-180 g/day
250 LBS (113.6 kg)	135-225 g/day
300 LBS (136.4 kg)	165-275 g/day

This protein intake should be spread throughout the day with each meal and snack providing 20-40 g of protein.

How to Choose a Quality Supplement

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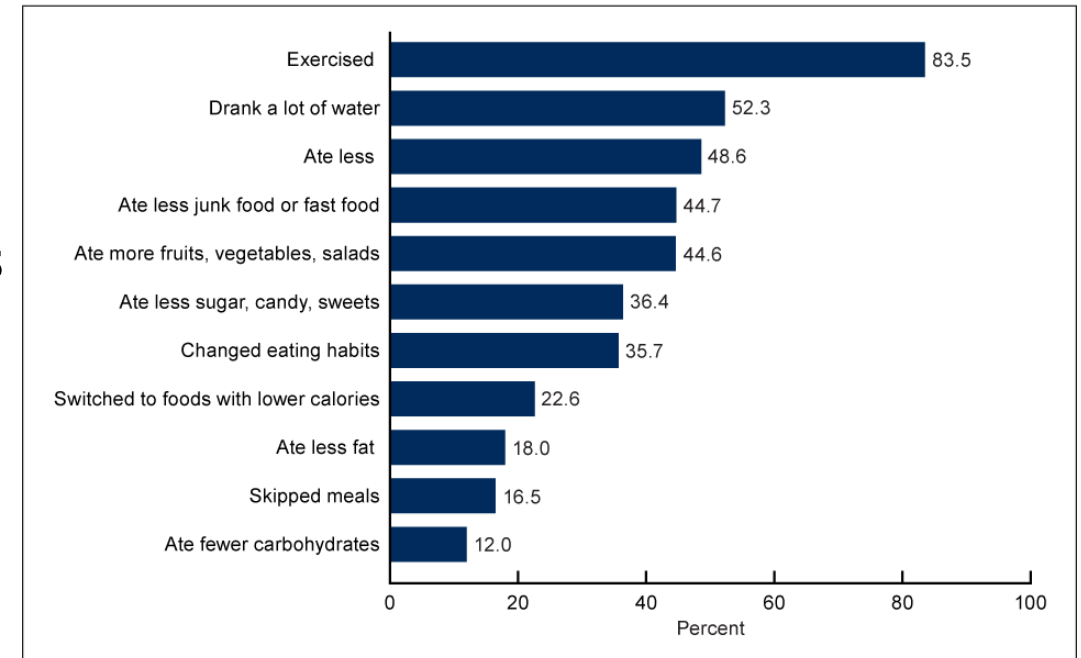
- Aim to use only supplements that have been tested for efficacy and safety by an outside party:
 - NSF Certified for Sport
 - US Pharmacopeia
 - Informed Choice
 - Also available as a convenient (and free!) mobile app (Informed Sport)
 - Labdoor
- Ask a Registered Dietitian



Dieting Trends in the US

- Between 2013-2016, 49.1% of adults and **37.6% of adolescents** reported trying to lose weight within the past 12 months.
 - Higher percentage of females vs. males in adults and adolescents
- Most commonly cited methods of weight loss included exercise, drinking more water, and general reduction in dietary intake.
- Disordered eating more prevalent among athletes, reaching as high as 45% in females

Figure 4. Ways of trying to lose weight used by adolescents aged 16–19 who tried to lose weight in the past year: United States, 2013–2016

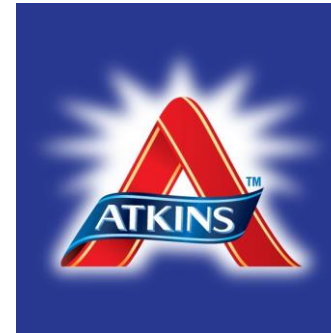


NOTES: Respondents could select multiple ways of trying to lose weight from a hand card listing 20 specific weight-loss methods; 82.1% of adolescents who tried to lose weight reported using two or more ways. Ways reported by less than 10% of adolescents who tried to lose weight are not shown separately. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db340_tables-508.pdf#4.
SOURCE: NCHS, National Health and Nutrition Examination Survey, 2013–2016.

Popular Diets

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- The most Googled diets in 2020:
 - **Keto Diet**
 - **Intermittent Fasting**
 - **Paleo Diet**
 - **DASH Diet**
 - Atkins Diet
 - Military Diet
 - Sirtfood Diet
 - Whole30®
 - Alkaline Diet
 - Noom



Popular Diets: Ketogenic Diet

- Developed in the 1920s as a treatment for epilepsy
 - Reduction in seizures after 2-3 days of fasting
 - Similar results with high-fat, extremely low-carb diet
 - ↑ concentrations of BHB and acetone (ketone bodies)
- Recent resurgence in popularity with increased research interest related to:
 - Cancer
 - Alzheimer's disease
 - Parkinson's disease
 - Traumatic brain injury
 - Diabetes
 - Weight loss

Popular Diets: Ketogenic Diet

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- Macronutrient distribution:
 - ~5% carbohydrate
 - 10-25% protein (1g/kg body weight)
 - 70-85% fat



Popular Diets: Ketogenic Diet

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Pros

- High satiety, highly palatable
- Rapid weight loss, which enhances motivation
- Significant reductions in central adiposity
- Improved blood glucose control
- Sustained energy due to fat adaptation
- Has been used with limited adverse effects in pediatric populations

Cons

- Short-term side effects (“keto flu”)
 - Dizziness
 - Fatigue
 - Headache
- Risk of constipation
- Relies on expensive ingredients (meats, cheeses, high-quality oils vs. low-cost grains and starches)
- Not appropriate for all
 - History of eating disorder/disordered eating
 - Liver disease
- May increase blood lipids
- Research is mixed regarding sports performance benefit

Popular Diets: Intermittent Fasting

- Temporary period of fasting followed by designated window for intake of all kcal
 - Duration of fasting vs. feeding varies by type:
 - **Alternate-Day Fasting:** Alternate fasting or feeding days; full fast or 25% of usual kcal
 - **Whole Day Fasting (5:2 diet):** Fasting 1-2 days per week, with normal eating 5-6 days per week
 - **Time-Restricted Feeding:** Fasting for 16 hours per day, with an 8-hour eating window
- Area of considerable research interest in recent years:
 - Blood glucose management (type 2 diabetes)
 - Hypertension
 - Inflammation
 - Healthy aging
 - Weight loss



Popular Diets: Intermittent Fasting

Pros

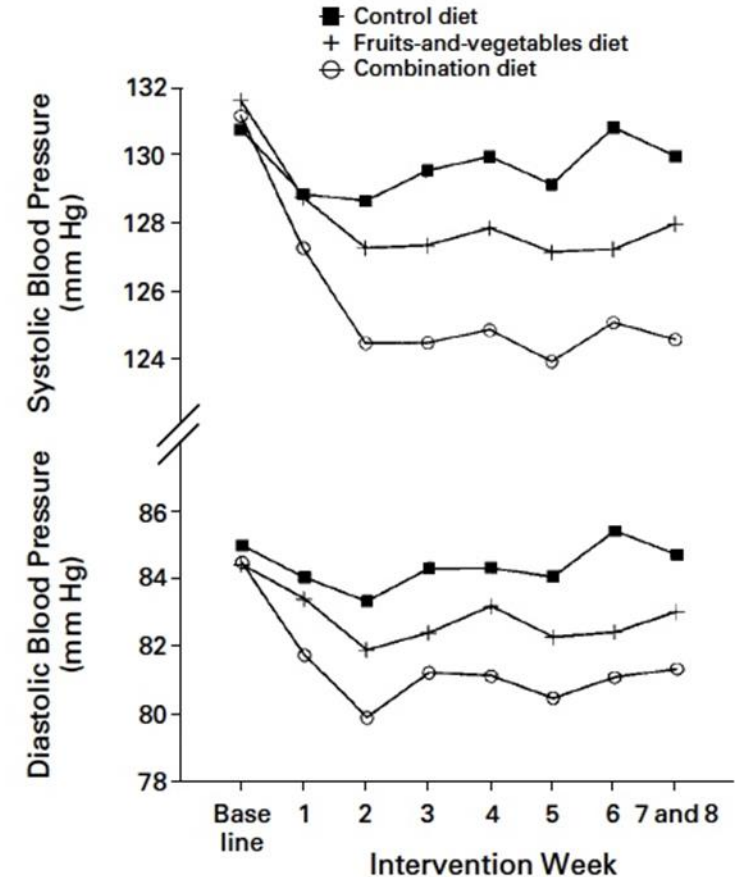
- Weight and (body fat) loss without intentional kcal restriction
- Improved insulin sensitivity
- Potential reductions in cholesterol and blood pressure
- Decreases in inflammatory markers

Cons

- Low energy during fasting periods
- Dysregulates intake and appetite cues
- May interfere with social life
- **NOT appropriate for anyone with history of disordered eating**
- Not recommended for children or teens
- Associated with decreases in cognitive functioning
- No benefit to sports performance, and may be detrimental for high-intensity activity

Popular Diets: DASH Diet

- **Dietary Approaches to Stop Hypertension (DASH)** was a multicenter, randomized feeding study, designed to compare the impact on blood pressure of 3 dietary patterns
- DASH was designed as a test of eating patterns vs. individual nutrients
- Objective was to identify practical, palatable dietary approaches to reduce morbidity & mortality related to blood pressure in the general population
- DASH diet (combination diet) significantly reduced blood pressure

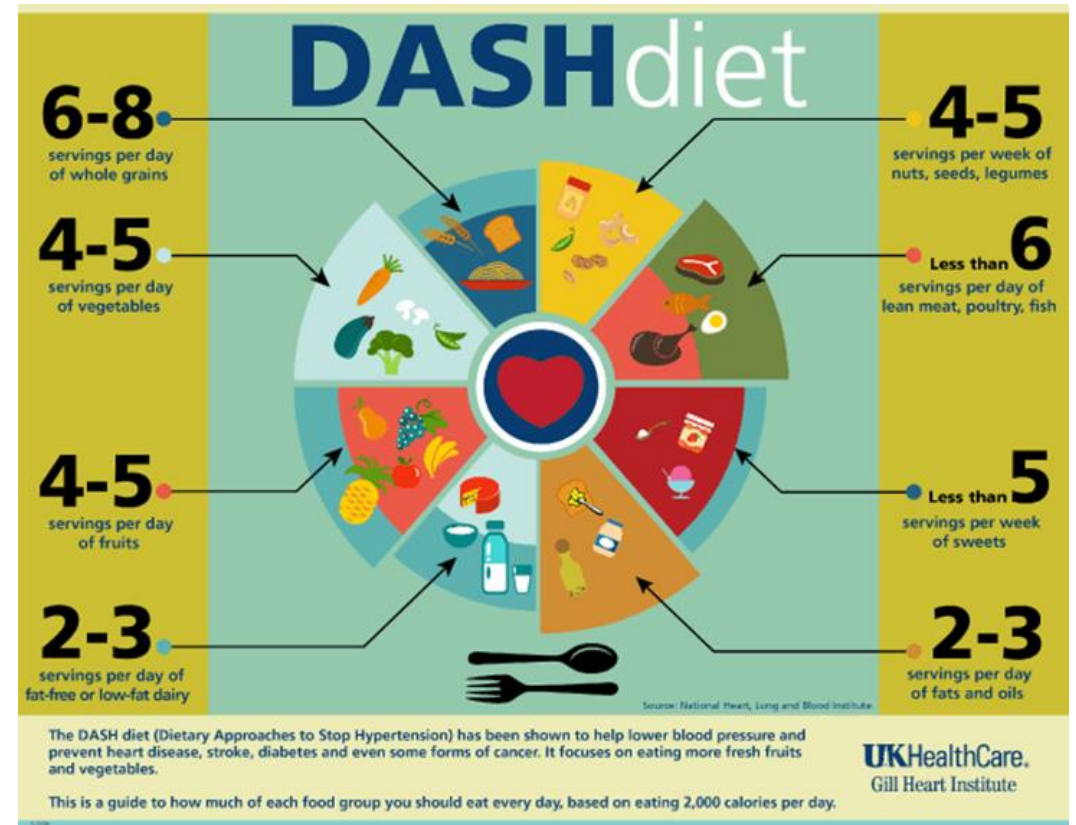


Popular Diets: DASH Diet

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Key nutrients:

- Dietary fiber from abundant fruits, vegetables, & whole grains
- Potassium from fruits & vegetables
- Calcium from low-fat dairy
- Magnesium from nuts and select fruits & vegetables
- May be considered a type of Mediterranean diet



Popular Diets: DASH Diet

Pros

- May be adapted for a variety of health conditions, with only minor modifications
- Widely studied
- Supported by NIH, AHA, USDA
- Many health benefits
 - Reduced risk of stroke
 - Decreases in LDL cholesterol
 - Reduced kidney stone formation
 - Improved insulin sensitivity when implemented > 8 weeks, **independent of weight loss**
- Focus is on a healthy dietary pattern, not kcal restriction

Cons

- Limited allowance for convenience foods or meals prepared outside the home
- Substantial dietary monitoring required
- Not palatable for some at the 1500mg sodium level
 - Likely not necessary for youth athletes

Popular Diets: Paleo Diet

- Diet modeled after that of hunter-gatherer ancestors (Paleolithic era) with the aim of preventing modern, chronic diseases
 - Belief that humans are genetically “mismatched” to modern farming practices that have allowed for high amounts of dairy, grains, and legumes in our diets

Foods to eat in abundance:

Fruits
Vegetables
Nuts and seeds
Lean meats (grass-fed, wild game)
Fish
Oils from fruits and nuts

Foods to avoid:

Grains
Legumes
Dairy
Refined sugar
Salt
Highly processed foods



Popular Diets: Paleo Diet

Pros

- Facilitates weight loss
- Improved lipid profiles
 - ↑ HDL, ↓ TG and total cholesterol
- Improved blood glucose control
- Emphasizes foods high in nutrient density

Cons

- Based on the assumption that there was a single Paleolithic dietary pattern
 - Relatively little historical evidence
- Limits some foods with established nutritional benefits
 - Whole grains, legumes, dairy
 - May be overly restrictive for athletes
- Expensive foods

General Nutrition Guidance for Youth Athletes

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- Most supplements are unlikely to provide significant benefit beyond a balanced diet.
- Some dietary supplements may be appropriate, but do your research to find a safe, high-quality brand.
- If weight loss is indicated in an athlete, gradual weight loss or weight maintenance are most appropriate with continued gains in height.
- Address fad diets with athletes and their caregivers directly.
- Processed foods should be limited but not necessarily eliminated. 😊
- Refer to a Registered Dietitian for assistance with nutritional concerns/questions.





SPORTS, WELLNESS, EXERCISE, AND ELITE PERFORMANCE (SWEEP) PROGRAM

ABOUT THE PROGRAM

Are you ready to take your athletic performance to the next level? In collaboration with select community partners, UAB Family and Community Medicine offers the Sports, Wellness, Exercise, and Elite Performance (SWEEP) Program. This program is open to competitive athletes as well as those working toward their athletic goals, ages 12 and older.

You will start with a comprehensive lifestyle and metabolic evaluation performed by a sports medicine physician. After your initial assessment, our experts will devise a plan with you to address your individual needs and areas of improvement. With an emphasis on enhancing your athletic abilities, our qualified team of sports medicine physicians, nutritionists, behaviorists, physical therapists, and personal trainers are here to guide you as you strive towards peak performance.

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ENHANCE YOUR PERFORMANCE TODAY

To schedule an appointment, call **205-934-9700**.

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