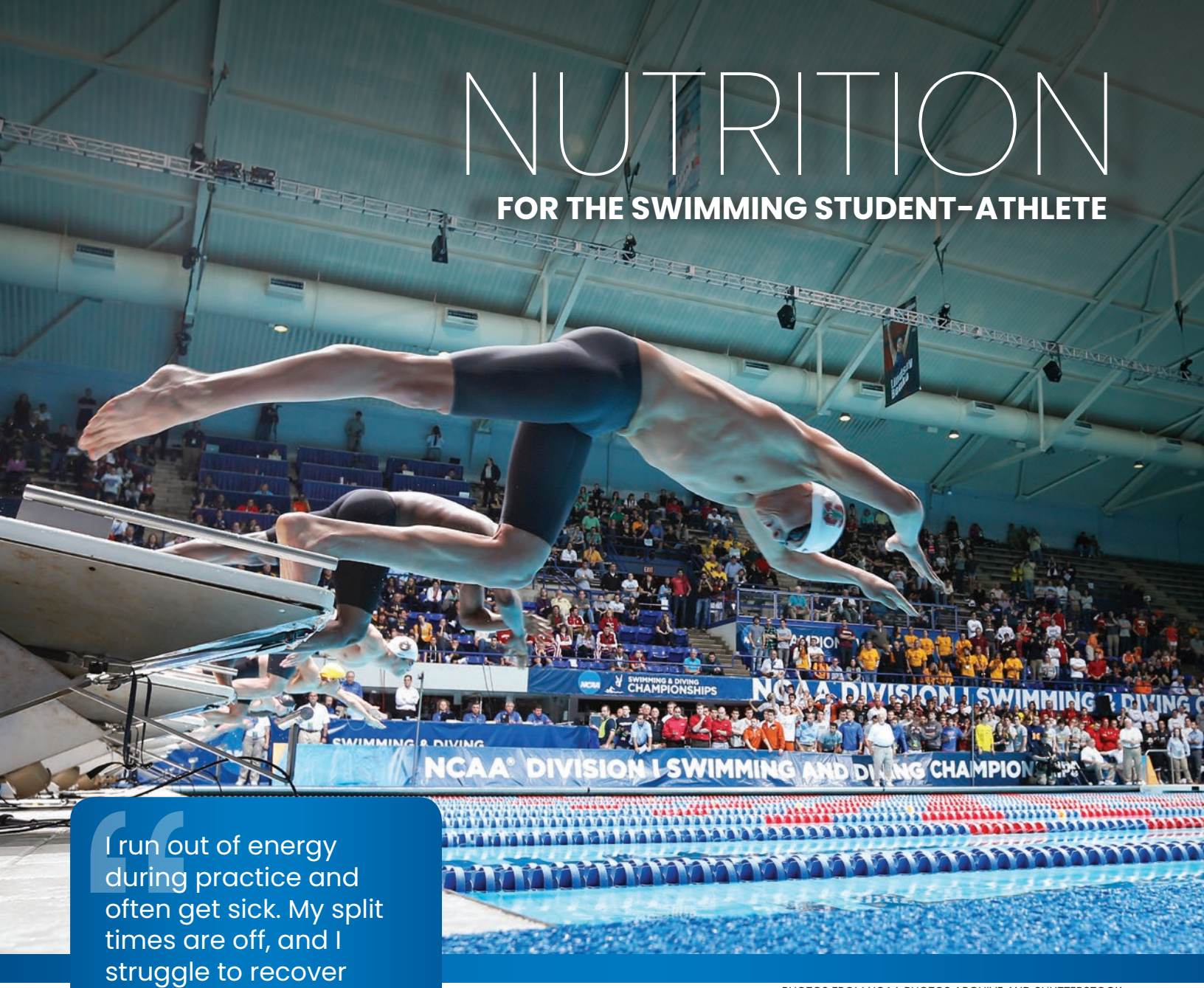
NUTRITION

FOR THE SWIMMING STUDENT-ATHLETE



PHOTOS FROM NCAA PHOTOS ARCHIVE AND SHUTTERSTOCK

> "I run out of energy during practice and often get sick. My split times are off, and I struggle to recover between sets. Even extra sleep doesn't stop the tiredness. I think I eat well, but something isn't working. What eating changes could improve my energy and recovery?"

Swimming success depends on power, speed and endurance. Periodized programs develop these qualities through pool workouts and dry-land conditioning. Training promotes adaptations in both aerobic and anaerobic energy systems. A strong nutrition foundation supplies needed energy and nutrients and supports recovery between practices.

Information provided by

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TRAINING

Build a solid nutrition foundation during training to develop energy systems, strength and power. Four nutrient groups help fuel practice and conditioning and support recovery between sessions:

- Carbohydrates
- Proteins
- Fluids
- Iron-rich foods

Carbohydrates. Carbs are stored as glycogen in muscles and the liver. Breaking down and oxidizing glycogen supplies energy for pool and weight-room sessions. Eating enough helps protect muscle stores during training and limit fatigue and soreness. Depending on practices, training phase and personal goals, daily needs range from 3 to 10 grams per kilogram of body weight. High-intensity exercise uses carbs faster, so intake should approach the upper end to restore glycogen. Eat carbohydrates at meals and around training throughout the day.

Proteins. Enough protein supports the best training adaptations. After swim practice or strength work, consume 20 to 25 grams of high-quality protein. Eat similar amounts at meals and snacks four to five times daily. Sources include lean meat, fish, yogurt, especially Greek, cheese, cottage cheese, eggs, quinoa, edamame and tofu.

Fluids. Follow a hydration plan. Being in the pool makes sweat loss harder to notice, so you may underestimate fluid lost in practice. Losing fluid equal to just 2 percent of body weight can impair training and performance.

Iron. This essential nutrient must come from food. It forms part of the proteins that carry oxygen to muscle and supports energy production and immunity. Low iron and anemia can cause fatigue, weaker immunity and poorer pool performance. Heme iron occurs only in animal foods; non-heme iron occurs in animal and plant foods. Heme iron is absorbed more readily.



COMPETITION

Before a championship invitational, most swimmers reduce training volume over several days or weeks. This taper clears lingering fatigue and maximizes training adaptations for race performance. It usually lasts eight to 21 days, gradually reducing volume while maintaining intensity and frequency. Individualize the plan, as tapers vary among swimmers. Lower energy use during a taper calls for lower intake to avoid major body-composition changes.

Invitationals span consecutive days, with morning and evening sessions. Schedules differ widely: one swimmer may enter two events total, another four or five each day. Multiple daily races require a fueling plan to sustain reserves and recover between events.

Eat a pre-race meal one to two hours before warm-up. Between races, have sports drinks and carbohydrate snacks. Within one hour of the session's last event, consume protein with carbs for recovery, often as a shake or smoothie. Use familiar, well-tolerated foods for all meals and snacks between races.

OFFSEASON

After a championship invitational, swimmers often rest for several weeks to take a physical and physiological break from training. Small changes in weight and body composition are expected, but much lower energy needs call for smaller meals to avoid large changes. Reduce intake mainly through carbohydrates because muscle fuel needs are lower. Keep protein steady to preserve muscle, and emphasize nutrient-rich fruits and vegetables. Sports drinks and sports foods are unnecessary during this phase.

PRACTICAL WAYS TO
INCLUDE CARBOHYDRATES



Meals: Include carbs from every category at each meal:

- **Starches:** 100 percent whole-grain breads, brown or wild rice, white and sweet potatoes, whole-grain pasta, beans, oatmeal and whole-grain cereal
- **Fruits:** Melons, berries, tropical fruit, apples, pears, fruit cups in 100 percent juice, dried fruit, applesauce and 100 percent fruit juice
- **Dairy and alternatives:** Low-fat milk, soy milk, flavored almond milk and yogurt

Snacks: Choose portable foods your stomach tolerates during practice: granola bars, whole-grain crackers, fruit, pressed-fruit products, dried fruit, yogurt, milk, sports bars, drinks and chews.



PRACTICAL WAYS TO
AVOID DEHYDRATION

- Begin drinking water when you wake.
- Keep a drink bottle with you all day.
- Have several glasses with meals.
- Keep a bottle handy on deck and sip between sets.
- Use sports drinks during intense practice.
- Add salt to meals to replace sweat-lost electrolytes.
- Check urine color and amount.

PRACTICAL WAYS TO
BUILD IRON STORES

- Add iron-rich foods to meals:
  - Heme: Sirloin steak, lean ground beef, pork chops and tenderloin, skinless chicken thighs, chicken breast, fish and shellfish
  - Non-heme: Iron-fortified cereal, enriched rice, eggs, beans, pumpkin seeds, spinach and tofu
- Help your body absorb iron:
  - Combine heme and non-heme foods.
  - Pair iron-rich foods with vitamin C sources such as citrus, peppers and tomatoes.
- Limit interference with absorption:
  - Avoid coffee or tea with iron-rich meals.
  - Eat dairy and leafy greens separately from iron-rich foods.
- Use a cast-iron skillet to add iron to foods.
- Discuss iron supplements with a dietitian or physician before considering them.





Swimming training programs

Water creates more resistance than air, presenting a special challenge for aquatic sports. Swim training develops energy systems and adaptations while refining strokes to improve propulsion and reduce drag.

Body composition. A strong power-to-weight ratio helps overcome water resistance and drag. Ideal composition differs by event and individual. Swimmers commonly have muscular builds, long limbs and large hands. Men are generally leaner and more muscular than women, and sprinters often leaner than distance swimmers.

Nutrition needs. Daily training determines a swimmer's calorie and macronutrient requirements.

- Carbohydrate is swimming's main fuel, while protein supplies building blocks for muscle adaptation and growth.
- Include enough key micronutrients, especially iron, calcium and vitamin D, to support training, immunity and bone health.
- Hydration also affects performance. Inadequate fluid can reduce performance and increase susceptibility to muscle cramps.



Written by SCAN/CPSDA Registered Dietitians (RDs). For advice on customizing a fueling plan, consult an RD who specializes in sports, particularly a Board-Certified Specialist in Sports Dietetics (CSSD). Find a qualified RD at www.scandpg.org or www.sportsRD.org.