

Injury Prevention & Food: Pointing you in the right direction

DANCERS' HEALTH CORNER

BY KATHERINE EWALT

Dancers' Health Corner is a new, regular column for *DSD* written by Katherine Ewalt from Performing Arts and Athletic Restorative Training Specialists (PAARTS) in San Diego. The column will provide information and/or advice and resources about dance-related injury and injury prevention. Due to legal limitations, no individual diagnosis or treatment plans will be provided through this forum. If you have questions you'd like answered, e-mail them to info@PAARTSsandiego.com.

Q: What types of foods and nutrients are important for dancers to consume to help with injury prevention? ~ San Diego Dancer

A: Nutrition plays a vital role in the dancers' ability to stay healthy and prevent injury. There are six groups of nutrients: carbohydrates, proteins, fats, vitamins, minerals and water. A balanced diet of quality foods and fluid will provide the dancer with the necessary nutrients needed for peak performance, growth, tissue repair and overall health.

The dancers' caloric intake must meet the energy demands for class, rehearsal and performance. On average, professional adult ballet dancers burn about 2,600 calories in a typical day of class and rehearsals. Dancers ages 6-18 may need anywhere between 1,600-2,500 calories each day. The specific calorie requirements depend on the individuals' height, weight and muscle mass. In general, a dancer's diet should contain 55 %-60% carbohydrates, 12%-15% protein and 20%-30% fat. Carbohydrate intake should increase to 65% during periods of intense training and rehearsals.

Carbohydrates are sugars and starches. Simple carbohydrates are sweet-tasting such as fruits, cookies, honey, candy, etc. They are easily broken down and quickly pass into the bloodstream. Complex carbohydrates include vegetables and grains. They provide glucose as well as the added benefit of vitamins, minerals and fiber. Carbohydrates are broken down by the body into glucose to be used as quick energy to fuel your muscles and brain. Excess glucose is converted into glycogen and stored as an energy reserve. Once the glycogen stores are full, the remaining excess glucose is converted and stored as fat.

Eating a low-carbohydrate diet depletes the body of its glycogen stores, resulting in decreased performance and mental function, often leaving the dancer feeling sluggish or uninterested in dance activity. Going without food, or eating very little, will cause the dancer's endurance level to drop resulting in fatigue.

Studies demonstrate 90% of dance injuries occur while the dancer is in a fatigued state¹. To avoid fatigue, dancers should have a small carbohydrate snack (energy bar, bagel, cereal) 1-2 hours prior to activity, as well as some carbohydrate during long rehearsal periods. Sport drinks are also a good option during activity as they contain an appropriate amount of glucose and aid in fluid and electrolyte replacement.

Protein is necessary for all dancers. It functions to help build and repair many body tissues including muscle that has been stressed through continuous use, an important consideration as the majority of dance injuries are a result of repetitive activity. Protein is also used as a secondary source of fuel. Meat and animal products provide the most readily available sources of complete proteins. Vegetarians are able to obtain protein from non-animal sources but will need to eat a combination of foods to ensure the protein content is comparable to that of animal products. Good sources of protein include chicken, turkey, lean beef (less than 10% fat), tuna, tofu, cottage cheese, yogurt, oatmeal, brown rice, whole wheat bread, lentils, lima beans and soybeans.

Dietary fat is a nutrient required for health. It has many functions in the body including insulation of organs and nerves, assisting in absorption of fat-soluble hormones and vitamins, maintenance of healthy skin, and as fuel for muscles. Saturated fats primarily come from meat, baked goods and full-fat dairy products. Less than 10% of daily fat intake should come from saturated fat as it is closely associated with chronic disease. Unsaturated fats help to reduce blood cholesterol levels and are found in items such as fish, nuts and vegetable oils. Unsaturated fats should make up the remaining 10%-20% of daily fat intake.

During periods of continuous dancing (>20 minutes), triglycerides (stored fats) are broken down to produce energy for muscular activity. This process begins as the glucose and glycogen stores are depleted. Eating a fat-restricted diet limits available energy impairing dance performance and possibly resulting in injury or other health problems including amenorrhea (absence of menstruation), which is linked to low estrogen, and the development of osteoporosis (softening of bones related to stress fracture/fracture)².

Vitamins and minerals are micronutrients that support metabolism. Vitamins assume several roles in the body including energy production, cell formation, and muscle and bone repair. B-complex vitamins are found in whole-grains, rice, nuts, milk, eggs, meat, fruits and leafy green vegetables. Vitamin C is

found in citrus fruits such as oranges, lemons and grapefruit as well as tomatoes, green pepper and potatoes. Vitamin A is found in liver and carrots; vitamin D in milk, egg yolks, butter, cream, fish and liver; vitamin E in nuts; and vitamin K is found in green leafy vegetables, beef, chicken and pork liver.

Minerals play an essential role with calcium, iron and zinc discussed here due to their importance for dancers. Calcium is essential in bone formation. Particularly during the growth years, it is vital that dancers consume adequate amounts of calcium to aid in bone development. Dancers with low bone mineral density, as well as dancers who consume insufficient amounts of calcium, calories and fat, are at increased risk for developing stress fractures³. Dairy products provide the fullest amount of calcium followed by green leafy vegetables, salmon and sardines.

Iron is important for oxygen delivery and energy production. An iron-deficient diet may lead to anemia, resulting in fatigue. There are two types of dietary iron: heme, found in meat (particularly red meat), and non-heme, found in plants. Non-meat sources of iron include chickpeas, bran flakes, boiled spinach, Muesli, dried figs and dried apricots. Non-heme iron is less absorbable by the body but its absorption can be increased by simultaneously ingesting vitamin C, for example eating bran flakes and drinking orange juice.

Zinc plays a role in the transport of carbon dioxide as well as a critical role in the body's healing process. Zinc deficiency may result in hair loss, skin lesions or decreased appetite possibly leading to under nutrition and, perhaps, anorexia nervosa. Sources of zinc include oysters, meat, chickpeas, pumpkin seeds, Muesli, cheddar cheese and yogurt.

Fluid intake is essential. Dance activity causes heat production, followed by an increase in body temperature and fluid loss via sweat. It is vital the dancer replace lost fluids to maintain the proper level of hydration necessary for performance and mental function. Thirst is not an accurate gauge for dehydration; once a dancer becomes thirsty, he/she is already dehydrated. It has been reported that as little as 1% water loss affects the body's performance, with 4% water loss cutting performance ability by 20%-30%⁴. Dancers should have water or sport drinks accessible during breaks in class or rehearsal and continue to drink fluids in the hours that follow to maintain hydration. Sport drinks should be used during periods of activity longer than one hour. Monitoring hydration can be accomplished by checking urine color. Clear to pale yellow urine indicates adequate hydration while yellow to dark yellow indicates dehydration. Dancers should use caution to not over hydrate as it may result in hyponatremia (water intoxication). Eating regularly will help to ensure the body has the necessary electrolytes to maintain water balance.

A nutrient- and fluid-restricted diet can have a detrimental effect on the body's ability to perform and repair itself following injury, and may lead to additional health risks. It is vital the dancers' diet meet the caloric and nutrient demands of dance activity to assist in injury prevention. To ensure nutrient needs are met, the dancers' daily diet should be well balanced including foods from each of the five basic food groups: bread/grains, vegetables, fruits, dairy and meat/beans/nuts. Proper nutrition and hydration will assist the dancer in both physical and mental focus during dance training

as well as provide the body with readily available energy for optimum performance and tissue recovery.

- Vitamin, mineral, and protein supplements were not discussed. A well-balanced diet should provide the dancer with the U.S. Recommended Daily Allowances of necessary nutrients. Dancers should use caution when taking dietary supplements, as excessive amounts of any one source may be harmful. Additionally, some supplements may result in yellow urine making the suggested dehydration monitoring method inaccurate.
- Food sources listed represent good sources of respective nutrients. These are not complete lists of all nutrient sources.
- Additional information and methods to determine calorie requirements can be found in the "Fueling the Dancer" fact sheet at www.DanceMedicine.org.

References:

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