Nutrition
Services

Sports Nutrition for Youth:

A Handbook for Coaches

Alberta Health Services

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Introduction

"Good nutrition accounts for 50% of my performance, with 40% being mental and 10% being physical."

Five-Time Canadian Olympian Hayley Wickenheiser

Proper nutrition and hydration have a major impact on young athletes' health and sports performance across all levels of training and competition. When athletes want to improve their physical skills – whether it is strength, speed, endurance, or power – they need to train well and eat well. Athletes who invest time to plan for healthy eating and hydration get more out of their training, perform better during competition, refuel their bodies faster, and have less illness and injury.(1)

Athletes often look to coaches as the most trusted source of nutrition information over parents, friends, teachers, or dietitians.(2) It is vital that coaches act as healthy role models who support athletes to make smart food choices for improved overall health and sports performance. Coaches can also work with parents, athletes, teachers, and the community to create healthier eating environments that support athletes to eat well at home, at school, on the road, in recreation centres, and in other spaces where they train or compete. When the healthy choice is the easy choice, athletes are more likely to eat well and perform better.

The information in this handbook is based on research and best practice in sports nutrition at the time of publication. For young athletes, proper nutrition is more important than ever because they must eat well to support both healthy growth and optimal sports performance. Active youth need to learn how to follow a well-balanced approach to eating which includes healthy amounts of fluid, protein, fat, carbohydrate, and other nutrients.

Purpose of this Handbook

Sports Nutrition for Youth: A Handbook for Coaches has 3 main purposes:

- To help school and community coaches support young athletes and their parents in making informed choices around nutrition and hydration for sports performance.
- To provide ideas on how coaches can help build healthier eating environments for athletes at home, at school, on the road, and in recreation centres.
- To help coaches address unique concerns such as vegetarian diets, alcohol, and nutrition supplements.

Please Note:

This handbook aims to support coaches who work with recreational athletes, rather than elite athletes. Always consult a sports dietitian for young athletes who compete at an elite level or who need special nutrition advice. Search for a Registered Dietitian in your area using the Find a Dietitian page on the Dietitians of Canada website.

Learning Outcomes

By using the information in this handbook, coaches will be able to:

- Speak to the value of eating healthy to support an athlete's training plan and well-being.
- Understand and value their role to promote healthy eating in the home, at school, in the community, on the road, and in recreation centres.
- Provide ideas for good eating habits by using Canada's food guide.
- Help athletes learn to make healthy food and fluid choices to fuel their bodies before, during, and after activity when they train, compete, or travel.
- Locate and use other credible online resources and tools to support athletes and parents.
- Address special concerns that may affect some athletes:
  - the effects of alcohol on health and sports performance
  - the safe use of nutrition supplements
- Identify when to refer athletes to health professionals or sports dietitians for support.

How to Use this Handbook

Each chapter follows the same format and has 3 to 4 sections:

1. **Key Teaching Points** that spotlight the main nutrition messages from the chapter. When you don't have time to cover all the information, you can refer to the key teaching points for ideas to share with your athletes.
2. **Background Information** that provides more detail and research about the topic of each chapter. This section explains the 'what' and 'why' behind the key teaching points and includes details such as meal, snack, and drink examples.
3. **How To** sections that outline ideas coaches can use to support the key teaching points.
4. **Teaching Tools and Resources** which are available online and can help coaches add more detail when talking about nutrition with athletes and parents. These tools and resources include websites, articles, handouts, or activity sheets. They can be passed along to your athletes and parents to provide ideas to help athletes eat healthy.

Coaches

Coaches: A Source of Nutrition Information

Key Teaching Points

1. Young athletes often view coaches as the most trusted source of nutrition information.
2. Coaches can support their athletes to eat healthy by sharing the information in this manual with athletes and their parents.
3. Coaches can learn new ways to work with athletes, parents, teachers, and other decision makers to ensure healthy food choices are available in the settings where athletes live, study, train, compete, and play.

Background Information

Coaches play an important role in teaching athletes and their parents about nutrition and sports performance because the coach is often viewed as the most trusted source of nutrition information.(2) There are 3 environments which impact the food choices of teen athletes: home, schools, and recreation centres. When coaches educate athletes, parents, teachers, and the community about healthy eating for sports, it may create more demand for better quality food options in all these environments. This could inspire athletes, parents, and spectators to select healthier foods.

How to Talk About Sports Nutrition with Young Athletes

- Use the information in this handbook to teach or remind athletes and parents about healthy eating habits to provide fuel for better sports performance.
- Offer a session on sports nutrition for parents and/or athletes where you outline the role of nutrition and healthy eating goals for sports performance.
- Set nutrition targets for teams and athletes. Good examples include:
  - to plan healthy food choices at home, at school, in the community, and on the road
  - to plan healthy meals, snacks, and drinks before, during, and after training or competition
  - to plan healthy meals, snacks, and drinks during travel
- Work with athletes, parents, teachers, and community members to assess and promote healthy eating environments in schools and recreation centres.

- Include a ‘healthy eating tip of the week’ on schedules.
- Talk about healthy food and drink ideas while travelling on a bus or when athletes are changing or stretching.
- Add healthy eating tips to your team talks or at the start or end of practice. If you keep healthy eating top of mind, athletes will be more likely to reflect on the food and drink choices they make.

- Contact local restaurants or the host school to ask if they are willing to provide high carbohydrate, low fat meals before games during a tournament or competition. Let your athletes know which restaurants are on board.

Teaching Tools and Resources

Coaching Association of Canada provides information on coach training and certification as well as tips on how to coach specific sports.

Additional sports nutrition resources to support this handbook are posted at ahs.ca/schoolnutrition:

- Handouts to print and share with athletes and their parents
- Posters to displays in gyms, locker rooms or recreation centres

Healthy Eating

Canada's Food Guide

Key Teaching Points

1. Athletes need to consume a variety of foods including vegetables and fruits, whole grain foods, and protein foods to meet their energy and nutrient needs.
2. Athletes may need to consume extra food to meet their energy demands on days when they train or compete.(3)
3. Athletes may need slightly more protein for muscle growth and repair. This can be achieved by consuming extra protein foods.(3)

Background Information

Balanced Meals and Snacks

Canada's food guide provides a visual of the types and proportions of foods for balanced meals and snacks. Vegetables and fruits, protein foods, and whole grain foods provide different nutrients to our body, so it is important to eat a variety of each type of food. Aim to have vegetables and fruits as half of your meal or snack, with the other half made up of an equal amount of proteins foods and whole grains.(4) This advice helps athletes receive a balanced mix of carbohydrates and protein as well as their daily needs for other nutrients such as fibre, vitamins and minerals.(3,5)

Intense Training and Competition

On days when athletes train or compete at high intensity or for long periods of time, they may need to eat more food. Encourage athletes to eat and drink enough to avoid fatigue and to satisfy their hunger and thirst. This will help them meet their increased energy and nutrient needs, and refuel their muscles.(5)

Advice on eating before, during and after intense activity will be covered later in the handbook.

Have Plenty of Vegetables and Fruits

Athletes need to eat plenty of vegetables and fruits to ensure they meet their energy needs and to help their bodies recover well.

- Most vegetables and fruits contain carbohydrates that provide the body with energy.
- Many vegetables and fruits provide vitamin C, which helps protect and repair body cells that are broken down by intense physical activity.(1) Athletes will benefit from choosing vegetables and fruits that are high in vitamin C such as oranges, grapefruit, strawberries, bell peppers, tomatoes, and broccoli.

Whole Grain Foods

Athletes need whole grain foods to help meet their energy needs.

- Grains are high in carbohydrate. Carbohydrates are the best source of fuel for athletes, who need to supply more blood sugar to the brain and muscles during activity.(6)
- The body stores carbohydrates as glycogen in the muscles and the liver. When an athlete doesn't store enough carbohydrate, they are at a greater risk of tiring quickly, having too little energy to train, or performing poorly during competition.(7)
- Athletes benefit from choosing whole grains because they contain more nutrients, such as B vitamins and fibre, than refined (white) grains.

Protein Foods

- Protein foods provide nutrients and are an important part of healthy eating. Protein helps build and maintain muscles and other body tissues.(8) Protein foods can also be a good sources of iron. Iron helps the body to use and carry oxygen to active muscle.(5) Some people need more iron, including children, adolescents and those following a vegetarian diet.

Examples of protein foods include:

- Animal-based: lean meats and poultry, fish, shellfish, eggs, milk, cheese and yogurt.
- Plant-based: nuts, seeds, beans, lentils, chickpeas, split peas, tofu, soybeans, and fortified soy beverage.

  * When eating plant-based proteins, include a source of vitamin C (refer to Vegetables and Fruit above). Vitamin C helps your body absorb iron.(5)
- Choose protein foods that come from plants more often. Plant-based protein foods can provide more fibre and less saturated fat than other types of protein foods. This can be beneficial for heart health.(9)

- Active people may need slightly more protein than those who are less active, but they can easily get enough by following Canada's food guide.(3) Athletes who eat too much protein may not get enough nutrients from the other foods. Please refer to the Nutrition Supplements for Young Athletes section starting on page 41 for more information on protein.(3)

Lower Fat Dairy and Fortified Plant-Based Products

- Athletes need to eat enough calcium rich foods to promote bone growth and prevent bone damage. The teen years (ages 11–17) are the time in life for building healthy bones.(10)
- Milk and fortified soy products are the best sources of calcium and vitamin D, which help build strong bones and muscles.(11) They are also a source of carbohydrate and protein.
- A practical way to help youth and teens to meet these nutrient needs is to include 2 cups (500 mL) of milk (skim, 1%, 2%) or fortified soy beverage every day.

Teaching Tools and Resources

AHS.ca/NutritionHandouts: Information and resources on healthy eating.

Healthy Eating Environment

Promoting Healthy Eating at School

Key Teaching Points

1. Nutrition is important for healthy growth, effective learning, and sports performance.
2. It is recommended that schools have healthy environments that offer and sell healthy foods and drinks to students and staff that support learning and work.
3. School (or school district) nutrition policies help to ensure a school offers and sells healthy foods, drinks, and snacks.

Background Information

Nutrition promotes physical growth and supports learning among children and youth. Students who meet their nutrition needs are better able to focus on learning and classroom activities. Teens are more likely to develop better eating habits when the school environment helps them learn and enjoy healthier food and drinks.(12)

Whether young athletes are on school teams or community teams, they are all still students. A school environment that offers and sells healthy foods better supports students' school and sports performance. Students spend about one third of each weekday at school, so a healthy eating environment supports them to make healthier choices.

How To Support Healthy Eating in Your Athletes

Coaches and athletes can promote a healthy school food environment through:

1. Non-Food Rewards

- Use rewards that do not include unhealthy food options such as candy or chocolate.
- Some ideas for rewards include:
  - recognition on team's social media page
  - pass to a bowling alley, swimming pool, movie, museum, art gallery or sports event
  - paid entry for a sports event such as a fun run
  - frisbee, soccer ball, baseball, football
  - gift card for a massage therapist or a sports store
  - e-book download
  - water bottle or thermos
  - sunscreen
  - travel-size toiletries

2. Healthy Fundraisers

- Sell healthy food such as fruit or non-food items such as poinsettias.
- Host social activities and events such as dance-a-thons.
- See Healthy School Fundraising for more ideas.

3. Healthy Foods at Special Events

- Take the focus away from the food and place it on fun and social connections instead.
- Start new healthy food customs at parties or track and field days.

4. Healthy Vending, Canteens and Cafeterias

- Ask for healthy meals, snack items, and drinks in school cafeterias, canteens, and vending machines.
- Suggest taste tests or student surveys to find out which healthy options athletes and their friends are willing to eat.
- See The Healthy Vending Toolkit for ideas.

5. Healthy Foods at Sporting Events

- Ask schools and food vendors to promote and sell healthy snacks, drinks, and meals during competitions and sporting events.
- Let guest teams know that there will be healthy options for their athletes – this is a great chance to lead by example.

6. School Meal and Snack Programs

- Support any plans for healthy breakfast, lunch, or snack programs in schools.

7. School Nutrition Policy

- For long-term healthy options, work with school leaders and student/parent councils to lobby the school or school district to develop a nutrition policy that supports healthy eating.

Teaching Tools and Resources

AHS.ca/SchoolNutrition: Information to help school communities incorporate healthy food knowledge and environments; also includes curriculum-based lesson plans, newsletter inserts, and more.

Healthy School Fundraising: Provides ideas from Alberta Health Services to help raise funds at your school by selling healthy foods.

Special Lunch Days: Tips on healthier food items to serve on hot lunch days or at special events.

Healthier together: Take Action - Nutrition Action Cards: Practical advice to take action on school wellness. Use them to spark your imagination and adapt them to suit your school community.

Promoting Healthy Eating in Community Recreation Centres

Key Teaching Points

1. Coaches can work with athletes, parents, and leaders at recreation centres to make sure there are healthy food options that fuel athletes and also keep all patrons healthy.
2. Recreation centres can create a nutrition policy to ensure the centre promotes and sells healthy food and drink choices. Nutrition policy can support good health and sports performance.

Background Information

Why Recreation Centres?

In many towns and cities, recreation centres are central places where people gather for meetings, events, and sports. Recreation centres play a role in helping people of all ages be healthier by sharing safe spaces for physical activity and socializing.

Recreation centres have the chance to align the value of physical and social well-being with healthy food and drinks. Creating centres of wellness will help support and maintain changes towards a healthy, active lifestyle for all users.

Parents, coaches, and athletes have power to persuade recreation centres to offer healthy food choices because they may be the main users or purchasers in these spaces. Teen athletes spend many hours each week at these centres for training and competition, and they often have to pack their own food to ensure they have healthy options to support good sports performance.(13-15)

How to Work with Recreation Centres to Promote Healthy Eating

- Share your goal to have healthy food options available for athletes, athletes' families, coaches, and members. All community members are potential users of these facilities, so they are likely to support such changes.
- Suggest the recreation centre use the Healthy Vending Toolkit to work with the food vendors to sell more healthy food choices.
- Ask athletes, their parents, coaches, and community members to write letters to vendors, recreation boards, city council, and sports councils to request healthy food and drink options at recreation centres.
- Use Stay Active Eat Healthy to determine with the recreation centre how many parents, coaches, and athletes will be more likely to purchase healthy food options.
- Ask the recreation centre to set up a nutrition policy that ensures healthy food and drinks are offered. Inform how a policy could highlight the centre as a health leader in the community, draw in new members, and create positive stories for the media.
- Contact local media (radio, newspaper, TV) to spotlight the challenges and the changes you would like to see happen.
- Contact your local public health partners for resources to help the recreation centre create a nutrition policy, and find healthier food and drink options.
- Rally support from others in your community and form a committee to start the changes.

Teaching Tools and Resources

Alberta Policy Coalition for Chronic Disease Prevention Policy Readiness Tool: The Policy Readiness Tool was created to increase local capacity for healthy policy change and is designed for individuals, organizations, and municipalities interested in creating healthier communities.

How to Market Healthy Food & Drinks, Healthy Eating in the Community: A collection of pictorial resources, information, and strategies to help facilities improve and sustain healthy food and drink changes. There are 11 posters that cover the 4 principles of marketing: Product, Pricing, Promotion, and Placement.

Communities Choosewell: Healthy Eating in Recreation Settings: A collection of resources, to help improve healthy eating environments in recreation centres.

- Cultivating Healthy Eating in Recreation Centres eCourse: 10 e-learning modules to improve healthy eating environments in recreation centres

  Module 1: Introduction into Healthy Eating in Recreation Settings
  Module 2: How Healthy is Your Environment?
  Module 3: Creating Healthy Eating Environments in Recreation Facilities Through Policy
  Module 4: A Business Case
  Module 5: Marketing Healthy Food and Drinks: the 4 P's *
  Module 6: Identify Healthy Foods and Drinks*
  Module 7: Concession Stand Menu Makeover*
  Module 8: Fueling Athletes with Healthy Food and Drinks
  Module 9: Indigenous Traditional Food Systems
  Module 10: Healthy Eating in Community Spaces

- A Fresh Start: A Guide to Offering Healthy Food and Drink Options in Recreation Food Services

Stay Active Eat Healthy: The Stay Active Eat Healthy® program aims to increase the provision of healthy food and beverages while restricting unhealthy options in municipal and community recreation facilities.

Promoting Healthy Eating at Home

Key Teaching Points

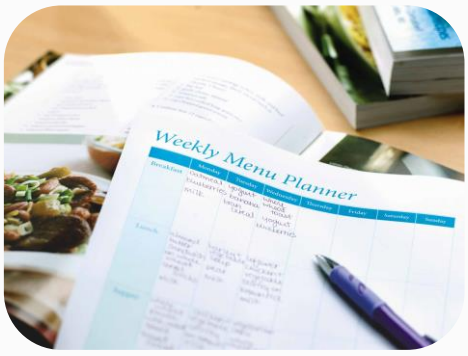
1. An athlete's everyday diet has an impact on sports performance.
2. Athletes need to eat a healthy breakfast to ensure their muscles refuel after many hours of sleep without food.
3. Athletes can eat healthy snacks when they feel hunger between meals.
4. Athletes need to develop a healthy eating routine by having healthy foods on-hand to meet their energy and nutrient needs at home, at school, and on the road.
5. When athletes and their parents plan meals in advance, they make healthier food choices and may also reduce food waste, and eat out less.
6. Athletes who learn to read food labels are better able to make healthy food choices.

Background Information

It is important for athletes to understand how and what they eat and drink each day can affect how well they train, perform, and recover.

Parents who know more about healthy food planning and grocery shopping may be better able to meet their teens' nutrition needs for growth and development.

Meal Planning



These tips can help athletes and their parents plan meals in advance and make healthier food choices:

- Set aside time to plan meals and snacks at least once or twice per week. Aim for balanced meals that have a variety of food from Canada's food guide.(4)
- Cook large batches of food to have leftovers for lunch or supper the next day.
- Use leftovers as a starting point to make a new, quick meal.
- Plan ahead for training, competitions, and travel. See the Planning for Tournaments, Competition, and Travel section (page 35), and the Sports Nutrition Travel Checklist found in the Tournaments and Travel handout for more details.

Label Reading

Food labels contain a lot of information to help consumers choose foods. Athletes and parents who learn to read food labels are better able to compare products and make healthier food choices.

Nutrition information is found in three places on food labels:

1. Ingredients List – This list shows what is used to make the food. The ingredients are always listed in order of weight, starting with the ingredient that weighs the most, and ending with the ingredient that weighs the least. In general, look for foods that do not list sugar or salt as one of the first few ingredients.
2. Nutrition Facts Table – The Nutrition Facts table provides details on calories (energy) and other nutrients in a food. The Nutrition Facts table can help athletes compare similar foods. All the data in the Nutrition Facts table is based on a certain serving size of the food. The serving size is listed at the top of the Nutrition Facts table.
3. Nutrition Claims – There are two types of nutrition claims on food products: nutrient content claims and health claims.
    - Nutrient content claims describe the amount of a nutrient in a food. “A good source of iron” is an example of a nutrient content claim.
    - Health claims are statements about the possible effects of a certain food on a person’s health when they include it in their diet. For example, “a healthy diet containing foods high in potassium and low in sodium may reduce the risk of high blood pressure, a risk factor for stroke and heart disease.”

Ingredients: Whole grain oats, Whole grain wheat flour, Bran, Sugars (brown sugar, corn maltodextrin, barley malt extract), Salt, Sodium bicarbonate, Caramel colour blend, BHT (preservative).

Nutrition Facts
Per 1 cup (30 g)

Calories 180	**% Daily Value***
Fat 2 g	3 %
Saturated 0.4 g + Trans 0 g	2 %
Carbohydrate 35 g	
Fibre 4 g	15 %
Sugars 7 g	7 %
Protein 5 g	
Cholesterol 0 mg	
Sodium 120 mg	5 %
Potassium 450 mg	10 %
Calcium 30 mg	2 %
Iron 8 mg	45 %

*5% or less is **a little**, 15% or more is **a lot**
* 5% ou moins c’est peu, 15% ou plus c’est beaucoup

Breakfast

Breakfast is a time to boost an athlete's carbohydrate intake to refuel muscles after a night of sleep. Include vegetables and fruits, whole grains, and protein foods from Canada's food guide in the breakfast meal.(3) If an athlete cannot eat a full breakfast due to an early morning training schedule, a quick snack that includes carbohydrates will ensure they have enough energy to train without getting any stomach upset.

Some examples of balanced breakfasts include:

- whole grain waffles or pancakes, low fat plain yogurt, berries, and eggs
- whole grain tortilla wrap with nut or seed butter, wrapped around a banana, and lower fat milk
- whole grain toast, boiled or scrambled eggs, and a fruit smoothie made with lower fat milk and frozen fruit
- cooked whole grain hot cereal made with lower fat milk and topped with a chopped apple, cinnamon, and nuts or seeds

To learn more about eating before activity, see Nutrition and Hydration Guidelines Before Activity, (page 22).

Snacks

Athletes need healthy snacks daily, even when they are not training or competing. Snacks help all youth meet their nutrition needs and satisfy their hunger between meals.

Here are some tips on how to help athletes choose healthy snacks:

- Have snacks that include the different types of foods from Canada's food guide. This helps athletes get a balance of carbohydrates and protein, meet their needs for other nutrients.(3,5)
- Ask athletes to keep a supply of healthy, non-perishable snacks in their locker or school bag so they do not have to buy less healthy options from vending machines or snack bars.
    - whole grain granola bar and a piece of fruit
    - box of raisins and a handful of almonds
    - whole grain crackers with nut butter

- Use Safe School Lunches (from Health Canada) to teach athletes how to keep cold foods cold, and hot foods hot when needed.
- Here are some easy snack choices to eat during the school day:
  - whole grain muffin and lower fat milk
  - hard-boiled egg and a piece of fruit
  - celery sticks with nut butter or hummus

Please see Nutrition and Hydration Guidelines Before Activity, (page 22) and During Activity, (page 26), for details on how snacks to support training and competition.

Teaching Tools and Resources

Menu Planning

Quick and Easy Meals: A handout from Alberta Health Services.

Cookspiration: Healthy recipes from Dietitians of Canada.

My Menu Planner: Menu planning tool from Dietitians of Canada.

AHS.ca/Recipes: Recipes from Alberta Health Services that are organized by types and main meals, so you can easily find the one you need.

Label Reading

Label Reading the Healthy Way: A handout from Alberta Health Services to help make sense of food labels.

Using Food Labels: Health Canada website with links to help explain all the parts of a food label.

Breakfast

Wake Up to Breakfast Every: A handout from Alberta Health Services with healthy breakfast ideas.

Snacks

Healthy Snacking: A handout from Alberta Health Services with healthy snack ideas.

Sports Nutrition and Hydration

Nutrition and Hydration Guidelines Before Activity

Key Teaching Points

1. Proper nutrition and hydration before activity can improve mental and physical performance.
2. Dehydration and over-hydration can have a negative effect on sports performance and health.
3. Athletes need to drink 400–600 mL (1½–2½ cups) of fluid, 2–3 hours before activity.
4. The best foods to eat before activity are high in carbohydrates, moderate in protein, and low in fat and fibre, to fuel the muscles and reduce any chance of stomach upset.
5. It's best for athletes to test new foods and drinks before training sessions rather than before a competition in case these items cause stomach upset.

Background Information

Proper nutrition and hydration before activity are vital to ensure athletes (1,6):

- have enough fuel for mental and physical performance
- can avoid physical discomfort caused by hunger, upset stomach, or dehydration

Dehydration and Over-Hydration:

Water has many functions in the body including the transport of nutrients to muscles and tissues, and the control of body heat through sweat.(16) When an athlete has lost more than 2 percent of body weight during activity, mental and physical performance can be impaired.(17) Athletes must drink fluids before they begin an activity and then continue to drink during and after activity.

Dehydration occurs when an athlete loses more water than they take in. Athletes lose water through their sweat, breath, and urine. Athletes cannot always rely on thirst as a sign of dehydration and may already be quite dehydrated by the time they feel thirsty.(17)

The most common signs and symptoms of dehydration include(17):

- feeling dizzy or lightheaded
- feeling tired and weak
- nausea
- having chills
- high heart rate
- having less urine and/or dark urine
- raised body temperature
- muscle cramps
- headaches
- thirst

Over-hydration (also known as ‘hyponatremia’) occurs when there is too much fluid and not enough sodium in the blood. In athletes, over-hydration often happens when they drink large amounts (8–10 L or 36–40 cups) of low sodium fluids (like plain water) before or during long bouts of intense activity (such as triathlons).(18) The signs and symptoms of over-hydration are much like the signs and symptoms of dehydration and can pose safety risks to an athlete’s health.(18) Athletes can prevent over-hydration by staying within hydration guidelines at all times.

Hydration Guidelines Before Activity

Athletes need to drink 400–600 mL (about 1½–2½ cups) of fluid 2–3 hours before activity.(6)

Nutrition Guidelines Before Activity

What are the best foods for athletes to eat before activity?

The best foods to eat before activity contain carbohydrate and protein.(1,6) Choose foods that are lower in fat and fibre to reduce the chance of stomach upset.(1) High carbohydrate foods digest quickly and are the main source of fuel for activity.

Choose foods that contain carbohydrates and protein:

- fruit or fruit smoothies
- pasta in tomato sauce
- cereal
- bread
- 1% or skim milk
- yogurt, 1% milk fat (M.F.) or less with fruit
- cottage cheese,1% M.F. or less and fruit
- hardboiled egg and toast
- wrap with lean meat (chicken breast, ham)

Avoid foods that are higher in fat or fibre:

- cheeseburgers
- fries or potato chips
- deep-fried foods
- bran muffins
- cream-based soups or sauces
- ice cream
- chocolate
- peas, beans and lentils
- cabbage, broccoli or cauliflower
- high fat meats (sausage, hot dogs, pepperoni, salami)
- cheese

Before a competition, it's best for athletes to eat familiar foods that will not cause stomach upset and cramping during activity.(1)

When is the best time for athletes to eat before activity?

The timing of meals is vital. If an athlete begins an activity with food in their stomach, this can cause cramping or nausea.(1) Eating a meal 2–3 hours before activity gives an athlete time to digest food and convert it to fuel for their muscles.(18) When it is not possible to eat a meal 2-3 hours before an activity, athletes can choose a snack 1-2 hours before.(1) This snack will help prevent hunger and provide energy for the activity. Athletes also need to drink water with their meal or snack before an activity to maintain hydration.(6) Athletes are at high risk for an upset stomach if they eat just before they start an activity.

Sample pre-activity meals: Eat 2–3 hours before an activity.

Choose meals that contain vegetables and fruits, whole grains, and protein foods from Canada's food guide.(1)

- whole grain toast with nut/seed butter, a piece of fruit, and lower fat milk
- chicken wrap, low fat yogurt, and a banana
- roast beef and vegetables in a stir-fry with brown rice and lower fat milk

Sample pre-activity snacks: Eat 1–2 hours before an activity.(1)

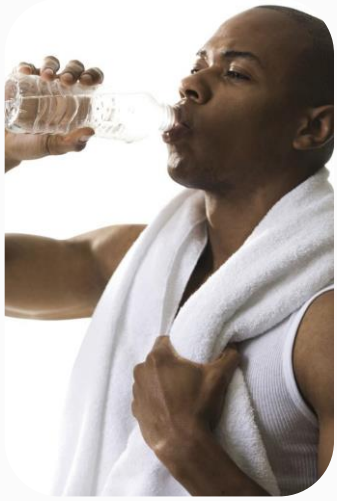
- granola bar, low fat yogurt and a banana
- pear slices and a whole grain English muffin
- toast with nut butter and an apple

Nutrition and Hydration Guidelines During Activity

Key Teaching Points

1. Proper nutrition and hydration during activity can improve mental and physical performance.
2. Dehydration and over-hydration can have a negative effect on sports performance and health.
3. Water is the best fluid for athletes who are active for 1 hour or less.(6)
4. Athletes may need a sports drink if they sweat a lot during intense activity that lasts more than 1 hour to replace sugar in the blood and mineral (electrolyte) losses.
5. Athletes need to drink 150–300 mL (½–1¼ cups) of fluid every 15–20 minutes during activity.(5)
6. It's best for athletes to trial new foods and drinks during training sessions to find out if these items cause stomach upset, or other physical effects that would impact them negatively during a competition.

Background Information



The amount of sweat an athlete loses will vary based on the intensity of the activity, their genetics, and the temperature or climate during exercise.(1) The more intense the activity and the warmer the temperature, the more an athlete will sweat.

Hydration Guidelines During Activity

- Athletes need to drink 150–300 mL (½–1¼ cups) of water every 15–20 minutes during activity.(6)
- Athletes can choose water when active for 1 hour or less.(6)
- Athletes may benefit from a sports drink when they sweat a lot and are active for more than 1 hour, in order to replace blood sugar and mineral (electrolyte) losses.(6,19)
- Encourage athletes to bring their own water bottle to drink fluid during activity.

Sports Drinks

Sports drinks help replace sugar in the blood used up by the muscles and brain, as well as the electrolytes lost through sweat during intense, nonstop activity that lasts longer than 1 hour. However, sports drinks are not all the same and their ingredients may change over time. It is important for athletes to always check labels when choosing a sports drink. Each athlete will respond better to some sports drinks over others, so test new drinks during training sessions rather than the day of a competition.

Young athletes likely do not need sports drinks if they have not been active and sweating for more than 1 hour.(6) Athletes don't need sports drinks before activity or after activity. Eating food and drinking fluids such as water and milk is the best way to fuel the body before and after activity.(6) Also, sports drinks contain sugar that can lead to cavities when consumed on a regular basis.(20)

When choosing a sports drink, consider these ingredients: (20)

See table on page 29 for a summary

Carbohydrate or Sugar

Athletes who are active for more than 1 hour need carbohydrate during activity to provide energy to their working muscles and brain. The recommended intake of sugar/carbohydrate per 250 mL (1 cup) of sports drink is 8–20 g.(6) Drinking too much carbohydrate can have a negative impact on performance such as upset stomach, cramping, or diarrhea.

Sodium and Potassium

Sodium (salt) and potassium are electrolytes that help control fluid balance and blood pressure in the body.(6) Athletes who sweat a lot for more than 1 hour will need extra electrolytes to prevent muscle cramps and dehydration.(6,11) The recommended intake of sodium and potassium per 250 mL (1 cup) of sports drink is 115–173 mg of sodium and 19–49 mg of potassium.(6, 21) Always read the label. There may be sports drinks that have slightly more or slightly less sodium or potassium per 250 mL (1 cup) serving, but they will still help.

Sugar Substitutes

Sugar-free or low-calorie sport drinks are not recommended because they do not provide the carbohydrate the body needs to sustain activity that lasts more than 1 hour. Examples of sugar substitutes are: sucralose, acesulfame potassium, aspartame, saccharin, stevia, and cyclamate.(22)

Other ingredients common in drinks:

Caffeine
Drinks that have caffeine can cause negative side effects such as headache, poor sleep patterns, mood changes, anxiety, diarrhea, or upset stomach. See the Nutrition Supplements for Young Athletes - Caffeine (page 49) to learn more about caffeine.

Natural Health Products
Some drinks may contain various forms of natural health products such as ginseng, ma huang, guarana, yerba mate, açaí, inositol, carnitine, creatine, glucuronolactone, or ginkgo biloba. None of these ingredients have been shown to enhance performance and could pose serious health risks to young athletes whose bodies are not yet fully grown. See Guidelines for the Safe Use of Natural Health Products, (page 53) to learn more.

Carbonated Fluids
Fluids that are carbonated (have bubbles) often make athletes feel full. Athletes may then drink less fluid and dehydrate during activity. Carbonated fluids may also cause stomach discomfort and gas.

Table 2: Compare common drinks young athletes may choose during activity that lasts more than 1 hour

	Carbohydrate (CHO) per 250 mL	Sodium per 250 mL	Potassium per 250 mL	Caffeine, Natural Health Products, Sugar Substitutes	Carbonated	**Does this meet the Goal Range?**
Goal Range	8–20 g	115–173 mg	19–49 mg	None	No	
Sports Drinks	8–20 g	100–210 mg	15–100 mg	May contain sugar substitutes (check the label and choose a sports drink with no sugar substitutes)	No	Yes
Energy Drinks	27–30 g Too high	Varies Too low or too high	Varies Too low or too high	Contains caffeine; may also contain sugar substitutes or natural health products	Sometimes	No.(23) See Facts on Energy Drinks for more information.
Vitamin Fortified and Flavoured Waters	13–14 g	0–13 mg Too low	0–875 mg May be too high	May contain caffeine, sugar substitutes or natural health products	Sometimes	No.(24)
Soft Drinks	22–28 g Too high	10–53 mg Too low	3–15 mg Too low	May contain caffeine or sugar substitutes	Yes	No.(25)
Fruit Juice	24–34 g Too high	2–14 mg Too low	2–68 mg May be too low	None	No	No.(25,26) Juice can be used to make the Homemade Citrus Sports Drink (see Hydration during Activity for recipe)
Iced Tea	21–23 g Too high	0–50 mg Too low	0 mg Too low	May contain caffeine or sugar substitutes	No	No.(25,27)

Water is the best choice during activity that lasts less than 1 hour or does not cause the athlete to sweat a lot.(6)

Nutrition Guidelines During Activity

In most cases, an athlete will not need to eat during activity if they have eaten enough to fuel their muscles and body before they train or compete.

Athletes may need to eat during an activity when(1):

- it is a nonstop endurance activity that lasts longer than 1 hour
- it is a morning activity and the athlete has only eaten a small breakfast

Examples of intense, nonstop activity:

- long distance running
- triathlon
- long distance swimming
- cross-country skiing
- long distance biking

Eating During Activity

Athletes who are active for less than 1 hour do not need to eat food during activity unless they did not eat enough food before the activity. When athletes perform an intense activity for more than 1 hour, they need 30–60 grams of carbohydrate in small amounts during each hour of activity, and need to drink enough water to maintain hydration and energy levels.(1,19) Athletes can consume this carbohydrate through sports drinks or food or a combination of both. During competition, have athletes choose foods that they already know will not cause them stomach upset or cramps.(1)

Examples of Carbohydrate Food Choices Include (26,28):

- 1 large banana (27 g carbohydrate)

- 1 medium orange (15 g carbohydrate)

- 4 dried apricots (22 g carbohydrate)

- 1 small box (28 g) raisins (22 g carbohydrate)

Sports Food Products

Sports food products such as sport gels, beans, chews, and bars can help athletes refuel blood sugar levels and electrolytes during intense activity that lasts more than an hour.(1,6) However, unlike sports drinks, these products do not provide hydration during intense activity when athletes sweat a lot.

Sports food products are only helpful during activity. Athletes will not gain any benefit if they consume these food items as snacks or part of a meal before or after activity.(1) These products are low in fibre, high in sugar and calories, and can be costly. Promotion of these products by famous athletes may lead young athletes to believe they should use these to become more fit or to perform better at sports.

If an athlete wishes to consume sports food products during intense activity, consider these guidelines:

- Use the Nutrition Facts table to see how much of the product they need to consume to get 30–60 g of carbohydrate per hour of intense activity.(1,6)
- Avoid products that contain sugar substitutes or caffeine.(20,22)
- Drink enough water with these products to prevent stomach upset (1) and to ensure good hydration.

Nutrition and Hydration Guidelines After Activity

Key Teaching Points

1. Proper nutrition and hydration after activity are important to refuel and repair tissue.
2. Dehydration and over-hydration can have a negative effect on sports performance and health.
3. Athletes who have less than 24 hours to recover between training or competition need to eat foods that provide carbohydrate and protein within 30 minutes of finishing activity in order to refuel quickly.(1)
4. When more than 24 hours is available to recover between training or competition, athletes do not need to eat food within 30 minutes of finishing activity. They can wait until they feel hungry to eat.(1)

Background Information

There are many benefits of proper nutrition and hydration after activity:

- Athletes will have enough energy, fluid, and nutrients to recover from an event or training session and to fuel up for the next bout of activity.
- Eating protein helps athletes build and repair muscles and other tissues.
- Drinking fluid replaces losses from sweat and breath during activity.

Hydration Guidelines After Activity

Young athletes need to drink 4 mL of fluid per kilogram of body weight after exercise to ensure good hydration.(6) On average, this would be 250–500 mL (1–2 cups) of fluid for a young athlete. One sign of healthy hydration is urine colour. After activity, athletes can continue to drink small amounts of fluid until their urine appears pale yellow.(6)

Nutrition Guidelines After Activity

The timing of the snack or meal following an activity will depend on the amount of time between training sessions or competitions.

Less than 24 hours until next activity

- Eat within 30 minutes of activity to ensure your muscles refill their glycogen stores before the next activity.
- Choose foods with both carbohydrate and protein.(1)

More than 24 hours until next activity

- There is no need to refuel within 30 minutes of activity when an athlete has more than 24 hours to recover.(1)
- Athletes can refuel with food sources of carbohydrate and protein when they are hungry for their next meal or snack.

What are the Best Foods for Athletes to Eat After Activity?

To refuel muscles, athletes need to eat a meal or snack that provides carbohydrate and protein at a 4 gram:1 gram ratio.(1) Parents, athletes, and coaches can use the Nutrition Facts Table or Canadian Nutrient File to find the carbohydrate and protein content of foods.

Carbohydrate foods:

- fresh, frozen, or canned fruit
- fruit smoothie
- whole grain bread, bun, pita, flat bread, or bagels
- whole grain cereal
- whole grain pasta or rice
- couscous
- quinoa
- yogurt
- 100% fruit juice or dried fruit
- milk or fortified soy beverage

Protein foods:

- lean meat
- fish
- poultry
- tofu
- beans and lentils
- nuts, seeds, or nut/seed butter
- cottage cheese
- Greek yogurt
- cheese
- milk or fortified soy beverage

Well balanced meal and snack options include:

- 1 medium banana with 250 mL (1 cup) of milk (32 g carbohydrate, 8 g protein = 4:1)
- 175 mL (¾ cup) of granola with 250 mL (1 cup) of milk (77 g carbohydrate, 20 g protein = 4:1)
- 175 mL (¾ cup yogurt) with 125 mL (½ cup) of fresh berries (35 g carbohydrate, 8 g protein = 4:1)
- 1 slice whole grain toast with 15 mL (1 Tbsp) peanut butter and 1 small apple (29 g carbohydrate, 6.5 g protein = 4:1)

Teaching Tools and Resources

Sports Nutrition for Young Athletes: A position paper from the Canadian Pediatric Society.

Sport Hydration: A webpage from Dietitians of Canada that discusses sports hydration guidelines.

Sport Nutrition: Facts on Carbohydrate, Fat and Protein: A webpage from Dietitians of Canada.

Healthy Snacking: A handout from Alberta Health Services that helps Albertans plan and create healthy snacks.

Planning for Tournaments, Competitions, and Travel

Key Teaching Points

1. Athletes need to make healthy food choices and drink enough fluids during competitions for good mental and physical performance.
2. When menu planning, athletes and their parents should focus on the types of food and drinks found on Canada's food guide to ensure good nutrition and hydration during competitions.
3. Coaches, athletes, and parents can find out ahead of time which food and drinks will be available at restaurants and event venues when on the road. When healthy choices are not available, it is important to bring healthy food and drinks.

Background Information

Benefits of Proper Nutrition and Hydration

Competitions may require athletes to compete and train in many events over a short period of time. Proper nutrition and hydration are vital to ensure athletes:(29)

- consume enough energy, fluid, and nutrients to recover from one event or training session, and prepare for the next
- have enough fuel for mental focus and physical performance
- prevent physical discomfort caused by hunger, upset stomach, or dehydration

Menu Planning and Meal Timing During Competitions

The amount and type of food that athletes need will vary based on the amount of time they have between competition or training sessions. When the amount of time between events is less than 24 hours, athletes will benefit from consuming food and fluid within 30 minutes of ending the first event.(1)

Athletes need foods high in carbohydrates, moderate in protein, low in fat, and low in fibre to refuel quickly if they have less than 3 hours between events.(1) Carbohydrates are the main source of energy for the brain and muscles. Protein repairs and builds muscles. Fat and fibre take a long time to digest and may cause stomach upset during the next event when athletes have less than 3 hours to digest their meals.

It is best for athletes to test how their body reacts to certain amounts and types of foods and drinks during practice or training.(6,29) Competition is not the time to try new foods or drinks. Athletes who choose familiar foods during competition will avoid having stomach upset or cramps.(1)

Guidelines to help athletes plan and time meals and snacks:

If the next event is	Follow these guidelines
more than 3 hours away	Eat a regular meal. Include vegetables and fruits, whole grain foods and protein foods from Canada's food guide.(6)
less than 3 hours away	Eat a low fibre, low fat snack or meal made up of different food types from Canada's food guide.(6)
within 1-2 hours or if athletes have a "nervous stomach"	Drink a liquid snack, such as a low fat smoothie without added sugar, sweetener, or honey.(6,29)
more than 24 hours away (including training sessions)	Eat enough carbohydrate and protein within the next 24 hours. Timing of the snack or meal is not as rigid.(1)

General tips for competitions:

- Drink water to rehydrate between events to ensure enough fluid intake.(6,29)
- Focus on familiar foods during competition to avoid stomach upset or cramps.(6,29)

More examples of meals and snacks can be found in Nutrition and Hydration Guidelines Before Activity, (page 22).

Nutrition Tips for Travel

Before leaving on a sports trip, it is helpful for parents, coaches, and athletes to research the foods and drinks that will be available at the hotel, restaurants, and sporting centres. Many menus will be posted online, but you may need to call ahead for this information. It may be helpful to ask about ingredients and how the food is prepared.

Athletes, parents, and coaches can all help plan ahead for travel.

- Bring healthy foods and drinks to support good nutrition and hydration while on the road.
- Bring water bottles and drink plenty of fluids during and after traveling.
- Always pack extra snacks and drinks in case there are surprise changes in schedules.

It is important to consider food safety when packing foods and drinks to prevent food borne illnesses. Cold foods must be kept cold, and hot foods hot. The Safe School Lunches resource can teach athletes how to keep food at the right temperature.
Check the Sports Nutrition Travel Checklist found in the Tournaments and Travel handout for more ideas.

Teaching Tools and Resources

Choose Healthy Menu Options: A webpage from Health Canada with information about how to choose healthier foods when eating away from home.
Label Reading the Healthy Way: A handout from Alberta Health Services to help Albertans read food labels and make healthy food choices.

Safe School Lunches: A webpage from Health Canada that talks about food safety and how to keep cold foods cold, and hot foods hot when traveling.

Special Considerations

Vegetarian Eating

Key Teaching Points

1. Vegetarian diets can be a healthy choice for athletes but require careful planning to ensure their food choices meet all of their energy and nutrient needs.(30)
2. Vegetarian athletes need to ensure they consume enough of the following nutrients; protein, vitamin B12, iron, calcium, and vitamin D.(30)

Background Information

Vegetarian diets can be healthy for athletes if they make good food choices to ensure they meet all their nutrient needs. Vegetarian athletes who do not plan their food choices are at higher risk for a lack of certain nutrients that can affect their health, growth, and sports performance. If a coach is concerned about the eating habits of a vegetarian athlete, it is best to recommend that the athlete and their parents consult a dietitian.

Vegetarian athletes need to follow the Canada's food guide and the points listed below to ensure their diet meets their health, growth, and training needs.

Total Energy

Vegetarian diets are often higher in fibre, so an athlete may feel full before they have eaten enough energy to fuel their body.(1) These athletes can choose to eat more or have larger snacks to help meet their energy needs. Vegetarians can also choose healthy, higher calorie snacks like nuts, seeds, nut butters, cheese, dried fruit, and avocado to support activity and training.

Protein

Plants are the main source of protein for vegetarians who do not eat eggs or dairy products. Vegetarian athletes need the same amount of protein as other athletes. They can meet their protein needs by eating protein sources such as soy, beans, nuts and seeds.(30)

Vitamin B_{12}

Vegetarian diets tend to provide lower amounts of vitamin B_{12} because this nutrient is only found in animal products.(30) If a vegetarian athlete does not eat dairy products or eggs, they need to consume foods and drinks with added vitamin B_{12}, such as fortified nutritional yeast or fortified soy beverage and soy products. What You Need to Know About Vitamin B12 - Unlock Food (Dietitians of Canada) has a list of food sources of vitamin B_{12}.

Iron

Iron carries oxygen through the body and helps prevent fatigue. The body does not absorb the iron in plant foods as well as the iron in meats.(1) Vegetarians need to consume 1.8 times more iron than non-vegetarians.(30) Vegetarian athletes need to eat iron-rich meat alternatives often, such as kidney beans, brown beans, chickpeas, lentils, and split peas. Eating plant-based proteins such as legumes with a source of vitamin C will help the body absorb more iron from these foods.

Vegetarian athletes can ask their doctor about testing their blood iron level. If their levels are too low, they may need an iron supplement.(30) How to Get More Iron From Food - Unlock Food (Dietitians of Canada) and Iron and Your Health are two resources that provide information on iron in food.

Vitamin C

Vegetarians can increase the amount of iron the body absorbs by including a good source of vitamin C when eating iron-rich plant foods such as beans.(5) Good sources of vitamin C are listed in Iron and Your Health and What You Need to Know About Vitamin C - Unlock Food (Dietitians of Canada).

Calcium

Calcium helps build strong bones, muscles, and nerves. Vegetarian sources of calcium include: dairy products, fortified soy beverages, almonds, figs, beans, tahini, tofu made with calcium, and broccoli.(30) For vegetarians who eat fish, canned salmon and sardines with bones are also sources of calcium.(30) There are also many other plant-based drinks that may be fortified with calcium such as almond milk and rice beverage. A list of Food Sources of Calcium is available from Dietitians of Canada.

Vitamin D

Alberta Health Services recommends that all healthy Albertans, aged 0–70 years, take a 400 IU vitamin D supplement every day in addition to 200 IU of vitamin D consumed from food and drinks. Milk is always fortified with vitamin D; however, some soy or plant-based beverages do not have added vitamin D so it is important to read the label. Vegan athletes or athletes who do not consume milk can speak with a dietitian to assess if they need to take more vitamin D supplements. Dietitians of Canada provides a list of Food Sources of Vitamin D.

Teaching Tools and Resources

Vegetarian and Vegan Diets - Unlock Food: A webpage from Dietitians of Canada with links to information about vegetarian and vegan diets

Nutrition Supplements for Young Athletes

Key Teaching Points

1. With the exception of vitamin D, all athletes can meet their vitamin and mineral needs through food alone if they eat a wide range of vegetables and fruits, whole grains and protein foods from Canada's food guide. Alberta Health Services recommends that all healthy Albertans aged 0–70 years old take a 400 IU Vitamin D supplement each day.
2. An athlete's best sports performance depends on a healthy and well-planned diet, regular training, good sleep habits, and genetics rather than a mix of supplements.
3. All athletes can meet their protein needs through high quality food sources such as dairy products, soy, beans, lentils, tofu, eggs, fish, beef, poultry, pork, and other lean meats.
4. There is not enough research about the safety of most nutrition supplements for young athletes, so health and sport experts do not advise the use of these products with this age group.
5. It's important that any athlete who wants to use supplements consults a health professional first.
6. Research does not support the belief that optimal performance is achieved by taking more vitamins and minerals than required for good health.
7. Health Canada warns that some of the nutrition supplements which are deemed safe for adults (but not for teens) could still contain ingredients that are banned within the sports community.
8. If growing athletes take high doses of certain supplements, it can be unsafe and toxic, especially if they have health issues such as anxiety, diabetes, sleep problems, or heart, liver, or kidney problems.
9. Young athletes do not need to use protein or amino acid supplements to get the best results for muscle growth. They simply need to eat slightly larger amounts (10–20 g) of protein on days when they train or compete.

Background Information

What are Nutrition Supplements?

Nutrition supplements are products that can provide an athlete with nutrients they may not be able to consume in large amounts through food alone. Supplements are often classed into three groups: vitamin and mineral supplements, nutrition ergogenic aids, and natural health products.

Vitamin and Mineral Supplements

Vitamins and minerals are found naturally in the foods found in Canada's food guide. Although most of the vitamins and minerals in supplements are man-made, the human body absorbs these just as well as the natural vitamins and minerals in foods. Vitamin and mineral supplements usually come in the form of a chewable tablet, a pill, or a liquid.

Nutrition Ergogenic Aids

A nutrition ergogenic aid is a substance found in natural food sources that has been packaged in doses much higher than a person could ever consume through a normal diet.(1) Ergogenic aids claim (but may not be proven) to enhance sports performance by increasing strength, power, speed, or endurance.(31) Common examples include: caffeine pills, creatine powder, protein powders, and amino acid supplements.

Natural Health Products

Natural health products can be made from plants, animals, and other life forms such as bacteria.(32) Some people believe these products can help improve overall well-being, reduce the symptoms of illness, or enhance sports performance. Natural health products come in many forms such as tablets, capsules, tinctures, solutions, creams, ointments, powders, and drops. Common examples include herbal remedies, probiotics, and homeopathic or naturopathic medicines.

Are nutrition supplements safe for young athletes?

Athletes, parents, and coaches may believe nutrition supplements are harmless because they are sold over the counter and are often labeled 'natural', 'safe', and 'legal'. There is simply not enough research about the safety of nutrition supplements for young athletes. The effects of supplements on people younger than 18 years old may never be well known because it is not ethical to give children and teens products which could harm their health as part of a research study.(33)

Health Canada and the American Academy of Pediatrics do not support supplement use in growing athletes who are under the age of 18 due to the lack of proof that they are safe for this age group.(31,35) Athletes under the age of 18 should not take supplements without advice from a health professional.(32,34)

Why are supplements less safe for young athletes compared to adult athletes?

Experts strongly advise sports and health professionals not to compare the growing teen body to the fully grown adult body.(31,35) Nutrition supplements can have very different effects on teen athletes compared to adult athletes for the following reasons:

- Young, growing bodies break down, absorb, and excrete supplements much differently from fully grown adult bodies.(35)
- Even supplements that are proven safe and helpful in adults could have adverse effects in younger athletes.(35)
- It is very hard to predict how the regular use of a supplement will impact the physical and mental health of youth athletes because this age group faces complex body and hormone changes throughout the period of rapid growth during puberty.(36)

Why do young athletes use nutrition supplements?

Research suggests that the number of young athletes who use supplements ranges from 22–71%.(6) In a study in Alberta, 98% of recreational athletes aged 11–18 years reported using 1 or more supplements and on average, took 7 different supplements over a 3 month period.(37) The reasons young athletes choose to take supplements include:(33-37)

- seeing media or supplement ads that target teens and teen athletes
- trying to improve chances of moving into more advanced or elite sports levels
- looking up to adult sport role models who promote or use certain supplements
- trying to speed up recovery or healing from injury or illness
- feeling pressure to be like their teammates or peers who use supplements
- trusting that they will not suffer any harmful side effects
- trying to change body shape, weight or size, body fat levels, or muscle mass
- pushing their limits so they can train longer and harder
- trying to gain an edge over their peers with little to no effort
- fighting off fatigue
- boosting energy levels and their immune system
- taking advice from parents, coaches, or trainers who provide or promote supplements

Older athletes (15 years and older):

- are more likely to have money and access to buy supplements on their own
- search for supplement information on the internet rather than ask a qualified person

Younger athletes (14 years and younger):

- are more likely to take supplements because their parents, coaches, and trainers suggest or offer them
- are more likely to use supplements when they learn other people and peers use them

Guidelines for the Safe Use of Vitamin and Mineral Supplements

The teen body needs many different vitamins and minerals to support growth, organ function, good health, and mental and physical activity. Vitamins and minerals are important for sports performance because they help release the energy from carbohydrate, protein, and fat, and they carry oxygen and other important nutrients to the body's cells.(1) These nutrients are also important for athletes' bone health, immune system, and muscle growth and repair.(1)

Athletes can meet all of their vitamin and mineral needs by eating a well-balanced diet that includes a variety of foods.(1) However, Alberta Health Services recommends that all healthy Albertans aged 0–70 years old take a 400 IU vitamin D supplement every day, since they may not be able to get enough through diet or safe exposure to sunlight during the winter months.(38)

Vitamins and minerals are the most common supplements used by young athletes on a regular basis.(33,35,37) During times of training and competition, teen athletes tend to be hungrier and they often need to eat more foods from Canada's food guide to meet higher vitamin, mineral and energy needs.(1,39) Some research shows that young athletes naturally tend to eat more food than their less active peers and would therefore not need to take vitamin and mineral supplements.(33) Athletes can meet their needs through a balanced diet alone, but teens may lack the information to make these healthy food choices.(33)

Research on athletes and vitamin and mineral supplement use shows:

- Young athletes do not need vitamin and mineral supplements (other than vitamin D), if they consume enough nutrients from a range of foods from Canada's food guide.(1)
- Sports performance will not improve by taking more vitamins and minerals than required for good health.(1)
- Large doses of single or mixed vitamins and minerals can pose a health risk because they can be toxic or lead to harmful side effects through reactions with other nutrients, supplements, or medications.(40)
- Vitamin and mineral supplements do not provide athletes with any of the other vital nutrients found in natural food sources, such as fibre and energy.(1)

Vitamin and Mineral Supplements for Athletes

If an athlete wants to take vitamins or minerals, they can speak with a doctor or sports dietitian to find out whether the supplements are safe and helpful. Athletes may need to take a vitamin and mineral supplement when they are:(1,38)

- treating or preventing a health problem caused by a lack of a nutrient (e.g.: taking iron for anemia).
- sick for a long time and have a low appetite.
- recovering from a serious injury that requires extra vitamins and minerals (e.g.: wound healing).
- avoiding certain foods which contain certain nutrients (e.g.: vegetarians, vegans, athletes who have a milk allergy).
- restricting their intake for weight loss (which needs support from a dietitian and a doctor).

Note: Alberta Health Services recommends that all healthy Albertans take a 400 IU vitamin D supplement each day.

If an athlete chooses to take a supplement, they can prevent toxic effects by choosing one with no more than 100% of the dietary reference intakes (DRIs) for vitamins and minerals.(39)

Guidelines for the Safe Use of Nutrition Ergogenic Aids

The number of ergogenic aids on the market grows so quickly that it is hard to stay up-to-date on the safety and benefits of these products for young athletes. Very few of these aids have ever proven to improve sports performance. Many of these pose major health risks, especially if athletes use them often or in large doses.(1,31)

The government does not check all of the supplements on the market, so there is always a risk that an athlete may take a supplement that contains banned ingredients.(41) The Canadian Centre for Ethics in Sport strongly suggests that all athletes avoid ergogenic aids altogether.(41) If an athlete insists on using these products, they should consult a health professional to figure out whether the specific aid is safe, useful, and legal before choosing to take it.(1,41)

Protein and amino acid supplements, creatine and caffeine are the three most common ergogenic aids used by teen athletes and they have all been studied by experts. There are many other products on the market, but very few have ever been studied in enough detail.

Protein and Amino Acid Supplements

Some athletes believe they must eat a lot of protein foods or use protein and amino acid supplements to increase their muscle mass. It is true that athletes do need more protein than non-athletes to support muscle gain and repair, yet it is very easy to get extra protein just by consuming more protein foods found in Canada's food guide.(1) The human body absorbs the protein found in dairy products, fish, eggs, soy, and meats most easily(42,43), so athletes need to include these high quality proteins in their diet each day.

Vegetarian athletes can consume soy products on a regular basis, and they can also choose beans, nuts, and seeds to meet protein demands. Vegan and vegetarian athletes do not need to consume more protein than non-vegetarian athletes, but they need to ensure they eat enough plant-based protein overall.(44) See Vegetarian Eating (page 38) for more ideas on protein sources and portions.

Athletes who consume large amounts of protein powder, fish, poultry, or meats may not eat enough from the other food groups. Protein-rich foods will make athletes feel full quite quickly and this increases the risk that they will not consume enough vitamins, minerals, fibre, or energy to support optimal health and sports performance.(42) See Healthy Eating, (page 9) and Nutrition and Hydration Guidelines After Activity, (page 32) for ideas on healthy food sources and portions of protein.

What Do Athletes Need to Know About Protein?

- Avoid protein and amino acid supplements since there is not enough research to assess how safe and helpful these products are for youth.(42)
- For the best results for muscle growth and health, eat slightly larger portions of high-quality protein foods rather than use protein bars or protein and amino acid supplements. Protein bars, powders and drinks offer no extra benefit over real food. They may also be high in sugar, and low in other nutrients and fibre.

- Healthy athletes only need to consume an extra 20 g of high quality protein after training or competing to support muscle repair and growth.(44) Some food examples are:
  - 3 large eggs
  - 75 g (about 2½ oz) fish, poultry or meat
  - 175 g (¾ cup) low fat (2% M.F. or less), Greek style yogurt
  - 100 g (about 3 oz) textured soy protein
  - 75 g (2½ oz) part-skim mozzarella or lower fat cheese (20% M.F. or less)

- Athletes have better muscle repair and growth when they include a source of high quality protein as part of a snack or meal within the first 2–3 hours after weight lifting or sports training.(1,44)
- New athletes need slightly more protein and energy because muscle growth is greatest during the first phase of training when beginning a new sport.(44) Research shows that new athletes will naturally increase their food and protein intake to meet increased physical demands and increased hunger.(33)
- If an athlete chooses to use a protein powder, it is important to ask a dietitian for advice, and to read the ingredient list to look for banned substances or additives that are not recommended such as sugar substitutes.(41)

Creatine

Creatine is a natural substance that the human body makes in the liver, kidneys, and pancreas and it is then stored in muscle cells.(31,36) Creatine helps supply energy to all muscle tissues and supports the heart, lungs, and other key organs during physical activity.(45,46) The human body makes at least half of the creatine it needs each day while protein-rich foods such as lean red meats, pork, poultry, and fish provide the other half.(44,45)

Is Creatine Safe for Young Athletes?

Most of the research that supports the safe use of creatine to improve sports performance has only focused on adult male athletes rather than females and younger athletes. Creatine supplements are useful for fully grown adults who do not consume enough creatine in their diet, such as vegetarians and vegans, as long as they follow the advised dose.(1,31,42)

There is little to no research on the safety of creatine in young people(1,34), yet as many as 62% of junior high and high school athletes have used creatine supplements to try to build more muscle or speed up recovery.(33) The International Society on Sports Nutrition advises coaches to teach teen athletes about the risks of creatine supplements as part of standard teaching about nutrition for peak performance.(44) It is vital for coaches to work with parents and health professionals to guide and protect young athletes who insist on using creatine in order to prevent these teens from transitioning on to steroids and other banned supplements.(44)

What Do Young Athletes Need to Know about Creatine?

- Avoid creatine until your muscles and organs are fully grown and you are able to break down, use, and excrete each dose.(31,32)
- Before you use creatine, it's important to talk to a doctor or dietitian to make sure it is safe.
- Human muscles are limited in the amount of creatine they can store, so you will not gain extra muscle or energy by taking more than the advised dose.(1)
- Each athlete has their own unique response to creatine supplements based on how well their body makes creatine and absorbs creatine from food. A dose that works well for one athlete may cause bad side effects in another athlete.(1,46)
- Studies of adult men show that creatine may improve the ability to perform frequent short bursts of highly intense activity such as weight lifting and sprinting (when skating or running), but it does not enhance the performance of endurance athletes such as distance runners, swimmers, and cyclists.(1,42,45)

What are the Risks of Creatine?

- Young athletes who choose to use creatine may be at higher risk for self-esteem or body image issues and may be more likely to take harmful products such as steroids as they grow older.(45)
- Creatine is never safe for athletes who have health problems such as(1,46):
  - diabetes
  - stomach ulcers
  - high blood pressure
  - liver problems
  - kidney problems
  - gout (pain and swelling in the joints of the toes, ankles, elbows, wrists, or fingers)

- There is a high risk of severe dehydration or kidney damage when mixing creatine with certain foods and products such as (1,42,47):
  - caffeine supplements
  - foods and drinks that are high in caffeine
  - diuretics (water pills)
  - anti-inflammatory medications such as ibuprofen
- Creatine is never safe for athletes who are pregnant or breastfeeding.(1,47)
- The most common side effects of creatine supplements include(1,31):
  - fluid retention (getting puffy)
  - diarrhea
  - upset stomach or feeling the need to vomit
  - strained muscles or torn muscles from training too much or too hard
  - increased blood pressure
  - dehydration
  - muscle cramps
  - allergic reaction
- More is not better – the risk of harming the body is quite high for any athlete who exceeds the advised dose.(42)

Caffeine

Caffeine is a drug that enters the brain and speeds up the central nervous system.(48) Although many athletes believe caffeine will give them energy, it really just makes the mind more alert.(49) Surveys show that at least 30% of teen athletes use caffeine as a way to enhance sports performance and they are more likely to use caffeine if pressured by other members of their sports community.(21,50)

How Much Caffeine is Safe for Young Athletes?

Caffeine is classed as a drug because it poses serious health risks if taken too often or in large doses. Caffeine becomes toxic to all healthy adults when they consume 1000 mg in a day and it can cause death at 5000 mg per day.(48,51) Growing teen bodies are less developed and often smaller than an adult body, so young athletes have lower limits for safe caffeine intake.

Health experts stress the need to limit how much caffeine teens consume – even when they are the same size as an adult–for many reasons (48,50,42):

- There is not enough research to know the real effects and risks of caffeine for youth.
- Caffeine may make it harder for young minds and bodies to cope with the demands of growth.
- Youth often have too little blood volume to handle adult amounts of caffeine.
- Caffeine impairs the body's ability to absorb calcium from food to build healthy bones.
- Young people are less likely to consume enough healthy foods and sources of calcium (such as milk) if they fill up on caffeine drinks.

Table 4 outlines the maximum daily caffeine intake to ensure all Canadians stay within these limits.(52)

Table 4: Health Canada's guidelines on daily caffeine limits

Age Range	Daily Caffeine Limit
Children 4–6 years old	45 mg caffeine per day
Children 7–9 years old	62.5 mg caffeine per day
Children 10–12 years old	85 mg caffeine per day
Teenagers 13–19 years old	2.5 mg caffeine per kg body weight
54 kg/ 120 lbs	135 mg caffeine per day
58 kg/ 130 lbs	145 mg caffeine per day
63 kg/ 140 lbs	160 mg caffeine per day
68 kg/ 150 lbs	170 mg caffeine per day
72 kg/ 160 lbs	180 mg caffeine per day
77 kg/ 170 lbs	195 mg caffeine per day
81 kg/ 180 lbs	205 mg caffeine per day
Adults 20 years +	≤ 400 mg caffeine per day
Women: pregnant, breastfeeding, or planning to become pregnant	≤ 300 mg caffeine per day

How Much Caffeine is in Foods and Drinks?

Caffeine is found naturally in the seeds or leaves of many plants such as coffee beans, tea, cocoa beans, and guarana berries, but it can also be man-made to add to foods, drinks, and medications.(53) Caffeine intake among children and youth has increased by 70% over the past 3 decades.(50) This has coincided with the development of new caffeine containing products like energy drinks. See Facts on Energy Drinks (Dietitians of Canada) for more information.

The caffeine levels of common foods consumed by teens and young athletes are outlined in Table 5.(51,53)

Table 5: Caffeine Content of Common Foods

Food or Drink	Serving Size	Average caffeine content (mg/ serving)
Coffee	250 mL (1 cup)	120–180
Instant coffee	250 mL (1 cup)	75–105
Energy drink	250 mL (1 cup)	80–125
Energy shot	60 mL (2 oz) bottle	80–500
Regular or diet cola	355 mL (1 can)	35–50
Tea (black, green, white)	250 mL (1 cup)	30–50
Iced tea, sweetened	250 mL (1 cup)	10–46
Chocolate cake	84 g (3 oz) slice	40
Dark chocolate	28 g (1 oz)	19
Chocolate milk	250 mL (1 cup)	8
Milk chocolate	28 g (1 oz)	7

How Does Caffeine Affect the Body?
Each young athlete will have a unique response to caffeine based on many factors (48,49,54):

- how often they consume caffeine because the body becomes used to it over time
- how quickly their body absorbs, breaks down and excretes caffeine based on their metabolic rate
- how much blood volume (litres of blood) they have since caffeine affects smaller people faster and stronger
- whether they take medication that has bad side effects when mixed with caffeine
- whether they have eaten (the body will absorb caffeine more slowly with food)
- how well hydrated they are (dehydration increases the effects of caffeine)
- whether they are active (exercise increases the effects of caffeine)

What are the Risks of Caffeine?
Young athletes can have negative side effects if they consume too much caffeine, or take caffeine pills or caffeine shots. These problems can occur with a wide range of caffeine intake because each athlete has a unique response and tolerance. Athletes may benefit from avoiding caffeine if they struggle to sleep well, have a medical problem, or take medications.(48,47)

The most common harmful effects of excess caffeine include (48):

- increased heart rate
- feeling more anxious or nervous
- getting angry or annoyed very quickly
- upset stomach
- feeling restless
- trouble sleeping or staying asleep
- headaches
- trembling hands or body (‘the jitters’)
- irregular heartbeat
- throwing up

Guidelines for the Safe Use of Natural Health Products

Health Canada reviews natural health products to decide if they pose any health risks or have negative effects when taken with other products such as common medications and foods.(55) Health Canada assigns a Natural Product Number to license items that are legal, safe, high quality, and helpful. Even though licensed products are safe for most adults, they can still have harmful side effects when adults do not follow the dose on the label.(56)

In the United States, the safety standards and review process for natural health products are different. Athletes who buy supplements from the United States need to review the information from the Food and Drug Administration on Dietary Supplements to ensure they are safe.

How Safe are Natural Health Products?

Health Canada suggests the following groups avoid taking natural health products unless they have talked to a dietitian, doctor, or pharmacist due to the high risk of harmful side effects(32,56):

- children
- teens
- people who are pregnant or breastfeeding
- seniors
- those who have medical problems

The safety of supplements is never tested on youth so Health Canada stresses the need to consult a health professional before giving any of these products to children or teens.(56) If a young athlete wishes to take a natural health product, it is important to consult with a health professional such as a doctor or a dietitian before using the product.(56)

What are the Risks of Natural Health Products?

Young athletes are at higher risk for side effects from Natural Health Products than adults. Young athletes often have smaller bodies and may not absorb, break down, and excrete natural health products as well as a fully grown adult.(1,87) There are many risks and side effects to consider before taking licensed natural health products since they could(1,36,56):

- contain banned or harmful substances
- have health claims that are not appropriate for the actual ingredients
- be the wrong product to help with a certain health issue
- mask symptoms or signs of a serious illness
- have no warning on the label for those people who should not use the product
- interact with medications or other nutrition supplements
- cause harmful side effects if mixed with alcohol
- cause an allergic response

How Coaches Can Support Athletes

There is evidence that young athletes who start taking supplements will be more willing to use banned products in future if they continue to train and compete.(35) If a coach has concerns about a young athlete's health due to unsafe supplement use, it is rarely helpful to use shock or scare tactics.(35) A coach can instead ask the athlete to discuss the supplement with their family doctor in case there are medical risks or concerns about side effects with medications.(1)

Teen athletes are more likely than their non-athlete peers to believe media claims about supplements. The more they learn about healthy nutrition, the lower their rate of supplement use.(36)

Coaches can promote a "food first" attitude among young athletes to support healthier eating and better meal planning. The Coaching Association of Canada supports the position that nutrition supplements "should not be recommended until the athlete's health, diet, nutrition needs, current supplement and drug use, and energy requirements have been evaluated".

The American Academy of Pediatrics, Dietitians of Canada and the International Society for Sports Nutrition outline many ways coaches can support teen athletes around the use of nutrition supplements.(1,34-36) These include:

- Remain open minded and honest when asked about nutrition supplements.
- Explore the reasons athletes take supplements and how well they understand the effects and risks rather than ignoring the issue until it becomes a problem.
- Share the health risks of supplement use. Advise athletes to avoid supplements until they are fully grown because they may not be safe and could have a negative impact on their health and sports performance. Refer athletes to health experts for information about how a supplement impacts health and sports performance.
- Remind athletes who choose to take supplements to make sure these products have been deemed safe, helpful, and legal by Health Canada.
- Enhance athletes' self-esteem by helping them see that supplements are not a shortcut to better sports success.
- Support athletes who go through distress or anger when asked to stop a supplement. Coaches can assure these athletes that their progress and success are not a direct result of taking the product, but are instead due to regular training, a healthy diet, and enough recovery time.
- Learn about new supplements by working with professional sports groups and health providers such as doctors, sports dietitians and pharmacists. Stay informed about the World Anti-Doping Agency's Prohibited List to know which products are banned.
- Work with schools and sports clubs to help athletes make better health and nutrition choices. Promote a balanced diet, focus on well-planned training, and provide positive feedback when athletes make good choices for overall well-being.
- Highlight the need to prevent the use of supplements when developing policy or teaching tools for sports clubs, parents, and athletes.

Teaching Tools and Resources

About Natural Health Products: Information provided by Health Canada on the safety and risks of using Natural Health Products.

Supplements: Frequently Asked Questions: The Canadian Centre for Ethics in Sport provides answers to some common questions about the use of supplements in sport.

Vitamins and Minerals for Athletes: A website from Dietitians of Canada that explains the vitamin and mineral needs of athletes and active people.

Vitamins and Minerals and Sports Supplements: KidsHealth® has fact sheets for teens to explain the role of vitamins and minerals and sport supplements.

Informing You About Natural Health Products and Safe Use of Natural Health Products: Information sheets by Health Canada for consumers to promote and protect the health and safety of Canadians.

Food Sources of Caffeine: A list of the caffeine content of common foods and drinks from Dietitians of Canada.

What is Caffeine?: A fact sheet from KidsHealth® for teens to explain caffeine.

Alcohol and Sports Performance

Key Teaching Points

1. In Alberta, it is illegal for anyone under 18 years of age to possess, purchase, or consume alcohol in public.
2. It is important to delay the age when teens first try alcohol to protect the brain and body as they grow and mature during puberty.
3. Athletes who use alcohol before they train or compete will not perform well due to dehydration, broken sleep patterns, headache, fatigue, and lower levels of alertness.
4. Drinking alcohol during activity can lead to injury, reduced endurance, poor coordination, slower reaction time, and poor balance.
5. Having alcohol after competition or training will impair athletes' ability to refuel, repair, and strengthen body tissues.
6. The use of alcohol impairs sports performance for many days and raises the risk of injury while athletes train and compete.
7. Use of alcohol can cause the body to break down more lean tissue and make less muscle.
8. Teens cannot handle alcohol as well as adults because they often have less body weight, blood volume, and liver enzymes to dilute and break down the alcohol.
9. Genetics, weight, food intake, metabolism, medication, hydration, stress, and fatigue all affect the way alcohol impacts each person at any given time.
10. The risk of having alcohol problems later in life is reduced in half if teens delay drinking to at least age 17 or 18.
11. It is not safe to mix alcohol with caffeine or medications.
12. If a teen athlete does begin drinking alcohol, it's recommended they only do so in a safe and legal setting and they limit the amount.

Background Information

Youth, Alcohol and Alberta Law

As stated by the Alberta Gaming and Liquor Act, Section 87.1, it is an offence for a youth under 18 to possess, consume, or purchase alcohol in public.(57) However, it is legal for a parent or guardian to give their own underage child an alcoholic drink at home.

The terms “parent” and “guardian” refer to a mother, father, or legal guardian but do not include any other adult family members, or any other adults who are supervising young people.(57) Coaches can use this information to remind athletes of legal drinking age, and that they cannot legally provide alcohol to their younger peers.

Alcohol Use Among Youth and Young Athletes

Alcohol is the most common drug youth choose to use in Canada.(58,59) Teens are more likely than adults to have more than 2 or 3 drinks during a single event.(60)

Recent research provides insight into the ways in which young athletes and teens use alcohol:

- There is an increase in alcohol use and getting drunk among teen athletes in organized sport.(61) Young athletes report more binge drinking, but less total alcohol intake than their non-athlete peers.(62,63) It is unclear whether youth who binge drink are more likely to seek out sports, or if being in sports puts youth at higher risk of starting to binge drink, or both.(62)
- Teen boys who struggle with body image concerns and use nutrition supplements to increase muscle mass, are more likely than their male peers to binge drink.(64)
- Team sport athletes appear to drink more than individual sports athletes when their clubs or teams create a social culture that involves alcohol.(65)
- The younger the age that a teen begins to drink, the higher their risk of substance abuse problems and addiction as adults.(66) The age at which young people first try alcohol appears to have decreased from 18 or 19 years old to 12 or 13 years old over the past few decades.(67)
- Among Canadian youth aged 15 and older, 83% have used alcohol in the past year and 37% have engaged in binge drinking at least once per month by having 5 or more drinks during a single event.(99)

- The percentage of youth who are heavy drinkers (5 or more drinks during one event) grows from 14% in grade 9, to 41% in grade 12.(100) 14% of teen boys and 7% of teen girls report having 5 or more drinks at least once per week.(62) The percentage of Alberta students who have used alcohol in the past year rises from 15% in grade 7 to 75% in grade 12.(69)
- Moving between different schools or moving from junior to senior high school is a time when some students may begin to drink alcohol because they may face new pressures, changes in social circles, and sudden body changes.(70)

The Impact of Alcohol on Health, Growth and Safety

Young people often believe they are old enough to drink alcohol, yet neither their bodies nor their brains have matured enough to cope with this choice. Health research highlights the likely impact of alcohol on the growing human body:

- The teen brain is at higher risk of damage from alcohol than a more stable adult brain due to complex and frequent changes during puberty.(62,67)
- Early use of alcohol can lead to major learning and memory problems in young people.(66) Teen drinkers are more likely than non-drinkers to have lower grades and more reckless behaviour in both middle and high school.(67)
- The rate of personal harm caused by drinking alcohol is more than double for youth than for adults.(66)Teens that use alcohol are at much higher risk for alcohol poisoning, car crashes, risky sexual choices, suicide attempts, drowning, and the use of other drugs.(67)
- The area of the brain that promotes impulse control and safe decisions is not fully developed until age 24, so alcohol use at an early age may pose a greater risk of addiction as an adult.(70,71) As many as 40% of teens who start drinking between ages 11–14 will have alcohol issues in their lifetime.(71)
- Teens cannot handle alcohol as well as adults because young people often have less body weight, blood volume, and liver enzymes to dilute and break down the alcohol.(66,67) Prolonged alcohol use in young adults impairs the liver, lungs, pancreas, kidneys, hormones, immune system, and heart.(62,67,72)
- Teens who misuse alcohol report more health problems such as appetite changes, weight loss, eczema, headaches, poor sleep, and muscle pain.(67) Heavy drinking can lead to liver disease, nerve damage, weak heart muscles, bone loss, stomach ulcers, sexual health problems, and memory loss.(60,68,72,73)

The Impact of Alcohol on Athletic Performance

Athletes who use alcohol before they train or compete will impair sports performance due to dehydration, broken sleep patterns, headache, fatigue, and lower levels of alertness.(60) Drinking alcohol during activity can lead to major injury, reduced endurance, poor coordination, slower reaction time, and poor balance.(62) Having alcohol after competition or training will impair athletes' ability to refuel, repair, and strengthen body tissues.(72)

Athletes who drink alcohol even once per week have a higher risk of sports injury due to impaired judgment and coordination.(74) Studies show when adults have 5 or more drinks in one night, they will have a decrease in mental and physical performance for up to 3 days after.(75) If an adult drinks 5 or more drinks 2 nights in a row, their performance can suffer for up to 5 days after.(75) The impact of binge drinking on the sports performance of the growing brains and bodies of young athletes may be much worse because their bodies are often smaller and less developed.(67,76)

Table 6 outlines the ways in which alcohol can affect athletes and their ability to engage in sports.(60,67,72,76,77)

Table 6. Negative Effects Alcohol May Have on Athletic Ability

Body System	Negative Effects Alcohol May Have
Muscle Function	• decreases muscle strength and force • increases muscle cramps and pain • decreases ability to control body movement
Temperature Control	• causes blood vessels to dilate which leads to poor performance in hot climate • reduces core temperature which leads to poor performance in cold climate
Fluid Balance	• increases urine output which can lead to dehydration • increases sweating which can lead to dehydration
Blood Sugar	• causes blood sugar to drop which leads to low energy and poor mental function • impairs the muscles' ability to refuel with carbohydrate during activity and recovery
Digestion and Metabolism	• absorbs less of some nutrients such as B vitamins • uses up or excretes more of other nutrients such as zinc • breaks down more muscle • makes less muscle
Central Nervous System	• acts as a mood depressant • slows reaction time • impairs balance, fine motor skills, and hand-eye coordination • causes headache • causes upset stomach • impairs memory • leads to feeling dizzy • disturbs length and quality of sleep • reduces alertness • increases fatigue • causes shaking

It is Not Safe to Mix Alcohol with Caffeine or Medication

Many young athletes are not aware of the risks of mixing alcohol with caffeine. When teens mix alcohol with caffeinated energy drinks, they tend to consume more alcohol much more quickly because the high levels of caffeine excite the mind and mask the way alcohol slows down healthy brain function.(60,78,79) For more information on the food sources and risks of caffeine, see Nutrition Supplements for Young Athletes - Caffeine (page 49). For more information on energy drinks, see Facts on Energy Drinks (Dietitians of Canada).

Mixing alcohol and medication can lead to death because alcohol blocks or weakens the effects of some medications while making others stronger or more toxic. Some of the more common medications which can cause harmful physical or mental problems when mixed with alcohol include: sleeping pills, antidepressants, antibiotics, pain killers, and epilepsy or seizure drugs.(60,79)

How Coaches Can Support Athletes

The message coaches need to offer young athletes are:

- Delay the use of alcohol as long as possible to prevent negative impacts on growth, physical and mental health, and sports performance.
- The risk of having alcohol problems later in life may be cut in half if teens can delay drinking to at least age 17 or 18.(67)

Teens who have good relationships with coaches, parents, teachers, and other mentors are more likely to develop a healthy approach towards alcohol.(80) Coaches can help young athletes better understand how alcohol impacts healthy growth and sport performance. Once athletes have chosen to start drinking alcohol, advise them to only do so in a safe and legal setting, under parental guidance, and to limit the amount.

Coaches can correct myths about drinking with these facts(70,79):

- No two people can handle the exact same volume or pattern of alcohol intake, so it is not safe to drink as much as a friend, teammate, or adult.
- A person cannot always handle the same amount of alcohol each time they drink because genetics, weight, food intake, metabolism, activity, medication, hydration, stress, and fatigue all change the way alcohol affects the body at any given time.
- Growing bodies and minds are not able to handle alcohol as well as an adult body.

Other Drugs

Young athletes may also struggle with the use of other drugs, including marijuana. These drugs will have a negative effect on sports performance and will increase the risk of sports injury. These drugs may also impact an athlete's food choices, taste preferences, and fluid intake; both when using the drug and after the effects of the drug have worn off. Ongoing use of these drugs may lead to unhealthy weight gain or weight loss and changes in metabolism.(81-83)

Coaches who would like to provide more support to young athletes who use drugs can access the following supports and resources from Alberta Health Services:

- Alcohol and Health Information Series
- Addiction and Mental Health
- Overview of Other Drugs
- Parent Information Series
- Addiction and Mental Health Programs and Services

Teaching Tools and Resources

Alcohol and Caffeine–Youth and Young Adults at Greatest Risk: A fact sheet (English and French) outlining the unique risks for youth who drink alcohol mixed with high-caffeine energy drinks and other caffeinated beverages. The information was created by the Canadian Centre on Substance Abuse.

Alcohol and Energy Drinks: A website with information about alcohol and energy drinks.

How to Talk to Your Children About Drinking: A webpage with tips and information to help parents talk to kids about drinking.

Conclusion

The foods and drinks athletes choose during training and competition will affect their sports performance. It is important for athletes to have access to healthy food and drink choices where they study, play, travel, compete, and practice. A coach plays an important role in teaching athletes and parents about healthy eating and in making a case for healthy eating environments in schools, recreation centres, and the home. Athletes look to their coaches for support around body image issues, alcohol, and nutrition supplements. This resource was developed to answer coaches' questions and to provide the resources needed for coaches to best teach and mentor their athletes.

Appendix

Appendix 1.0

Links to Additional Sports Nutrition Handouts and Posters

The following resources are available at: ahs.ca/nutrition/Page9597.aspx

Handouts

Print out and share with athletes and their parents:

- Eating for Activity
- Hydration for Activity
- Tournaments and Travel

Infographic Posters

Display these posters in gyms, locker rooms or recreation centres as a visual learning tool:

- What to Eat Before Activity Poster
- What to Eat During and After Activity Poster
- Hydration Before, During and After Activity Poster
- Planning for Tournaments, Competition and Travel Poster

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