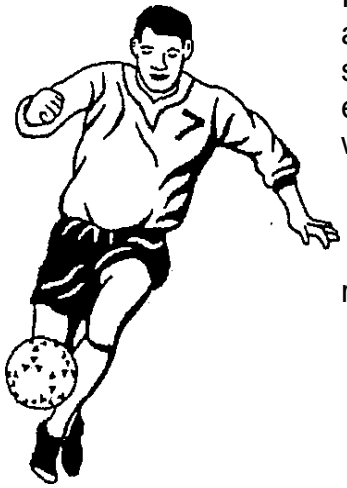
FOOD & FLUID FOR ACTIVE BODIES



It's a fact - what one has (or hasn't) eaten impacts energy levels and can affect the enjoyment of exercise. The haphazard diets of some teens, and the myriad of "best-seller" books about diet and exercise, can lead to poor food choices and low energy levels, which in turn can make activity a real chore. It's important to help students understand that the best food choices to support activity are easily made from basic foods. Whether a student is preparing for competition, or an afternoon of rollerblading, the right food choices can make it better.

Knowing how to choose food & fluid that provide the right kind of energy for activity is a skill that will last a busy lifetime.

LEARNING OUTCOMES:

After completing these units it is expected that students will be able to:

- Describe "sport nutrition" or food choices to support physical activity using the 4 food groups and messages outlined in Canada's Food Guide (CFG)
- Explain which nutrient requirements increase with activity (CHO and fluid for most active individuals) and why; describe food sources
- Explain why following the food guide will meet protein needs of active individuals and athletes
- Use Canada's Food Guide to evaluate their own food choices
- Plan an activity they enjoy; including appropriate food and fluid choices before, during and after activity (if necessary) to meet requirements during activity and to support recovery

Dairy Farmers of Manitoba

STUDENT ACTIVITIES: Food Style and Fuel for Activity

A) Food Styles

1. Personal assessment:
   - Students will keep a 1 to 3 day food and activity ecord

2. Personal planning:
   - Students will assess their basic food intake using the food guide or software (if available and time allows)
   - Use handout: Eat Right to plan improvement if appropriate and set a healthy eating goal

3. Mini lecture:
   - Use handout: Food the Fuel for Activity to prepare a mini-lecture on eating for activity; make copies for students to use in groups or individually.

4. Students will review their daily activity and use the handout to decide whether they need to modify their food/fluid intake to support activity. Because student activity will vary from none to recreational fitness, to students who participate vigorously in more than one sport, interest in and personal need for "sport nutrition" will also vary. Encourage students to apply information to their own level of interest and need.

B) Case Studies:

Students will read case studies in groups and answer questions to help the characters plan food choices that will help them be their active best.

C) Food for Activity

- Considering activities they currently do, or an activity they plan to do, students will use the handout: The Right Stuff to plan the type of food or fluid they will consume (or take with them) to be well fueled.

- A booster: Adolescents are busy and will likely find it easy to forget they made plans to change. To help students remember their plans to be more active or to change their food choices, revisit their healthy eating/activity goals regularly (once a week, every couple of weeks)

  Decide with students how often they would like to review their plans. If they find they are not able to put their plan into action, review the plan and the barriers that might prevent them from making it happen. Can the barriers be overcome, or does the plan need revising?

Eat Right

There's a lot more choice in healthy eating than there used to be (like in the old days when Canada's Food *Guide* was Canada's Food *Rules*). Nobody says you have to eat "3 square meals a day" anymore ... and if you don't want to drink your milk - you can eat it (cheese or yogurt!). Healthy eating can be "on the run" or you might be somebody who never actually eats a meal - that's OK ... you're called a "grazer". It doesn't matter *how* you eat your food, as long as by the end of most days you've eaten enough to get all the good stuff you need.

Oh yeah - one thing that is important is eating in the morning. It doesn't have to be a typical "breakfast" if that's not your style, but your body needs fuel after a night with no food ... that's why it's called break - fast ... get it? Try for something from 3 food groups (whatever you like) before mid-morning - say 10 a.m.

Answer these questions and make a plan.

1. Did you eat your recommended number of Food Guide Servings from each of the 4 food groups? ☐ Yes ☐ No

2. If no, what's missing ... and how much? _____

3. Considering foods you like (and don't like...), and your eating style, what food(s) could you add?

   _____

4. Go ahead and make a plan:

   I will eat _____

   I'll be (where) _____

   I will begin _____

5. What might prevent your plan from happening?

   _____

6. How will you fix it? _____

7. One last question ... how much water do you drink? _____

   If it's less than 6-8 cups ... it's not enough, especially if you're active.

   How will you fix your water intake? _____

Food ... The Fuel for Activity

Canada's Food Guide is the starting point for well-fueled activity. Whether planning a weekend roller blade with friends or preparing for a provincial championship, the messages in the food guide all fit! Here's what you need to do:

- Meet your recommended number of Food Guide Servings in each food group daily (this is for everyone - active or not!).
- Choose more servings from Grain Products and Vegetables & Fruits to meet increased energy needs of activity. These foods provide carbohydrate muscles need for energy.
- Choose a variety from each food group every day. No single food or food group has all the nutrients active people need. Take advantage of what's available!
- Meet nutrient & energy needs with wholesome food. Vitamin/mineral or single nutrient supplements can't ever replace food.

"Sport Nutrition"

The main difference in the diets of active and non-active individuals is the increased need for calories (or energy), carbohydrates and fluid for those who are active.

Activity levels among teens vary from none to recreational fitness, to those who participate vigorously in more than one sport every day. This means interest in, and personal need for, "sport nutrition" will also vary. Apply the following sport nutrition information at a suitable level of interest and need:

- **Carbohydrate (CHO):** fuel of choice for working muscle, CHO, is used in the body as blood glucose and stored as glycogen in muscles and in the liver. Working muscles rely on glycogen as the only fuel during short intense activity, or as part of the fuel mix during longer endurance-type exercise. Muscle stores can be used up during a couple of intense hours of activity. The body relies on us consuming sufficient food sources of CHO to "refuel" or refill depleted muscle glycogen stores. The more active one is, the more CHO foods they should consume. Grains, fruit, legumes, starchy vegetables and flavoured milk (i.e. chocolate milk) are all great sources of CHO.

  Note: Canada's Food Guide recommends 8 Food Guide Servings (FGS) of Vegetables and Fruit and 7 FGS of Grain Products for males aged 14-18 and 7 FGS of Vegetables and Fruit and 6 FGS of Grain Products for females aged 14-18. Really active individuals and hard training athletes are encouraged to choose more Food Guide Servings.

- **Fluid:** makes up the plasma in blood that transports nutrients and oxygen to working muscles, and allows perspiration which helps regulate body temperature. The longer the activity, or the hotter the temperature (or both), the more fluid the body loses through sweat. This can lead to dehydration, which reduces the ability to control body temperature and compromises oxygen delivery to muscles. At best dehydration - compromises performance; at worst it can lead to life threatening heat illness. Fluid intake should be at least 2 liters a day, with increased intake during training.

Consuming ½ - 1 cup of water every 15 - 20 minutes during activity is recommended as is scheduling fluid replacement: consume 2 cups per pound of body weight lost (1 L/kg) during activity and look for plenty of pale urine. Milk, soup & juice all count - but consuming water is also very important.

- **Sports drinks:** Water is all that's needed when activity lasts 60 minutes or less. Sport drinks are helpful when exercise is steady, intense and longer than one hour - or far intense stop-start games like soccer, hockey or basketball. Sport drinks are fluid with CHO and sodium added. The CHO is used by muscle for energy (which helps the body's stores last longer) and sodium helps the body keep fluid in cells. If the concentration is right (not over 5-6% CHO) the beverage will be absorbed as quickly as plain water. Sport drinks serve 2 purposes: hydration as well as an outside source of CHO.

- **Protein:** Needs are at a lifetime high during adolescence because of rapid growth and related tissue development. Long, hard endurance or strength training (2-3 hard, steady hours or more) can increase protein requirements. This change is easily met with food; protein supplements are not necessary.

    - The average protein need for adolescents is about 1 gram of protein per kg of body weight.
    - Research indicates that consuming 1.5 grams of protein per kg of weight will more than meet athletes' maximum needs.
    - It's essential to know that the increase in requirement associated with hard training can easily be met with food. Two to three Food Guide Servings of meat, 3 to 4 Food Guide Servings of milk each day and a few slices of bread will do it. Most active guys will likely find they are consuming this amount or more on a regular basis, girls may need to review and revise their food choices.

    Good quality protein is found in milk products, meat & meat alternatives and by combining grains with legumes. Vegetarian athletes or those restricting calorie intake must pay careful attention to consuming enough protein.

- **Iron:** is found in blood where it carries oxygen to working muscles. An iron deficient individual will tire easily during activity. Those at greatest risk of iron deficiency are:

    - Teenage athletes who are growing quickly
    - Girls - because of menstrual blood losses
    - Vegetarians who eat no red meat
    - Endurance athletes (sweat losses of iron can be significant)

    The best food source of iron is red meat - it is plentiful and well absorbed. Legumes and grains contain iron too, but not as much and it isn't used as well by the body. Consuming a source of vitamin C with legumes/grains increases iron absorption.

Vegetarians... Teens may choose a vegetarian eating style for any number of reasons. With enough knowledge and some planning, healthy eating can be simple. There's more than one type of vegetarian:

> **"Lacto-Ovo" Vegetarians:** often avoid only red meat, or all meat, fish or poultry. Eggs, cheese and milk (excellent protein sources) are eaten. Healthy eating is pretty easy: follow the food guide choosing Meat Alternatives. It may be difficult for girls to meet their iron needs without red meat. Most vegetarians are Lacto-Ovo.
>
> **"Vegan" Vegetarians:** do not eat any animal products and should be well educated in choosing the right protein & calcium alternatives or consult with a dietitian about their food choices. Legumes and grains must be combined to ensure good quality protein and alternate sources of calcium consumed in quantity. Less than 4% of vegetarians are Vegan.

Vitamin & mineral supplements: With the exception of iron, vitamin and mineral deficiencies that affect physical activity are rare. Choosing a wide variety of food - not supplements, is the best way to get the vitamins and minerals the body needs.
For those who do choose to take a supplement, a multi-type preparation taken once a day is the safest and most economical.

Special considerations: Students who regularly do exhausting workouts, train hard for a sport or play more than one sport need to pay special attention to:

- energy intake, and making time to eat, especially if play or practice take place over a meal time (e.g. early morning training/breakfast, noon intramural/lunch, after school games or workouts/dinner) ...eat breakfast - it's an essential source of fuel and nutrients!
- fluid intake
- adequate CHO throughout the day

Okay, first off, I'm a sports nut. You name it, I just do it: baseball, hockey, volleyball. Right now, we're into basketball season. My city team is in the semi-finals - I play point guard - and when we're not out eliminating a team, we're practicing for the next game. I'm so busy, my dad says he has to make an appointment just to say hello. He's joking ... I think.

Here's my problem. I know that the better I eat, the better I perform. But who's got the time? With evening practices and road games most weekends, we wind up grabbing a bite wherever we can. Burger places are my specialty. Even in my own kitchen now I sometimes catch myself thinking, "I'll have a Number Two with everything."

I've got to get my life in order. Take this food thing. What would YOU do in my shoes?

I need a fast food fix-up. The clock is ticking.

Chris

Name: Winnipeg Werewolves Hockey Club

Ages: 14-16 years old

The Winnipeg Werewolves are off to a hockey tournament in Thunder Bay. The bus ride will be 8 hours with plenty of rest stops on the way at gas stations and small diners. The first game will be the following day, so the coach wants to make sure his team is in top shape.

What are suggestions that you could make to the team on foods and beverages which would enhance their performance for the game? What are other foods that would hinder their ability to play up to their potential?

Name: Darla Sipowitz

Age: 15 years old

Darla has always been a big fan of cross-country skiing. This year she decided to try out for the team. The coach felt Darla was very talented and she got a position on the team.

Today is Darla's first race of the season. She has had several practices, but this is a much longer distance. They are competing against their division rivals who have some of the top skiers in the province. Darla wants to be in top shape for the race. Plan a menu for her pre game meal and what foods and beverages she should bring to the race to maintain her energy level.

Name: Elizabeth Tache

Age: 14.5 years old

It is a beautiful summer morning and Elizabeth doesn't want to waste the day inside watching television. She decides to go rollerblading in the park until lunch. After she gets dressed and has breakfast Elizabeth packs a bottle of water and her discman. She figures she will be back in about half an hour for lunch so she doesn't pack anything to eat. Elizabeth straps on her blades and is ready to go.

After about 20 minutes of blading, Elizabeth pauses at a park bench to finish the water left in her bottle because it feels about 30°C today. While sitting on the bench, she hears her name faintly. Suddenly, she realizes her friends Sylvia, Joseph, and Meagan are in the distance. When they eventually reach the bench, they explain that they are going to rollerblade around the park and ask Liz to come. She agrees and off they go.

Elizabeth and her friends become thirsty after 15 minutes, her friends had all forgotten to bring anything to eat or drink and Liz's bottle is empty. They decide to continue on a bit further. Finally, 25 minutes later Elizabeth begins to feel ill. She is super tired, and kind of light-headed. Sylvia, Meagan and Joseph admit to feeling the same. Joseph believes they are all getting the flu, but that isn't the problem at all. Explain what Liz and her friends did wrong on this sunny summer day and why they are feeling so ill. From your knowledge of sport nutrition, provide a solution (including specific amounts) to prevent this from happening again.

THE RIGHT STUFF!

Whatever your level or type of physical activity, choosing the right food can make your activity more fun - or your competition more successful.

After making your personal plan for regular activity, think about your fuel supply. What food or fluid plans will make your activity the best it can be!

ACTIVITY		FUEL PLAN	
Length of time	**Intensity**	**Fluid**	**Food**

Why did you make these food/fluid choices?

When will you do it?

What might prevent your plan from happening?

How will you overcome that obstacle?

STUDENT ACTIVITY: "… Which Would You Buy?"

Students will use handout "…Which Would You Buy?" to compare products specially produced for consumption by athletes and active individuals. The products are intended to:

- supplement energy during very strenuous activity (sport drinks at about 5 - 6% CHO)
- provide a convenient (non-messy) source of CHO during longer steady activity (energy bars)
- replace muscle energy stores used during long, hard endurance or tournament types of activity (energy replacement drinks).

The purpose of these often fairly costly items can easily be achieved with relatively inexpensive items from the supermarket.

❑ **Sport drink:** These beverages are consumed during exercise and helpful when strenuous activity lasts longer than about 60 - 90 minutes. They help replace fluid and add an extra source of carbohydrate energy. Look for 5-6% carbohydrate (CHO) concentration - it's absorbed as quickly as plain water. Compare equal volumes for CHO & price. A 50:50 mix of fruit juice and water can be used for the same purpose. .

❑ **Energy bars:** These provide a tasty energy source that is convenient and portable for eating during lower intensity activity, or after exercise. The flavor of some is more appealing than others. Look for a relatively high carbohydrate content. Compare equal weights of bars for CHO & energy. Cereal bars can be used for the same purpose. NOTE: You may need 2 bars to equal calories of 1 energy bar.

❑ **Energy replacement drinks:** These beverages are for consumption after strenuous activity. They help replace muscle energy stores - especially if consumed in the 1st 15 minutes after activity. A ratio of 3gm of CHO per gm of protein appears to be ideal. Look for CHO:protein @ 3:1 and good taste. Chocolate milk can be used for the same purpose; it has the suggested 3:1 ratio. NOTE: You need more chocolate milk to provide the same number of calories - that's OK, it means more fluid is consumed!

… Which Would You Buy?

❑ **Sport drink:** These beverages are consumed during exercise and helpful when strenuous activity lasts longer than about 60 - 90 minutes. They help replace fluid and add an extra source of carbohydrate energy. Look for 5-6% carbohydrate (CHO) concentration - it's absorbed as quickly as plain water. Compare with an equal volume of a 50:50 mix of fruit juice and water for CHO content & price.

❑ **Energy bars:** These provide a tasty energy source that is convenient and portable. The flavor of some is more appealing than others. Look for a relatively high carbohydrate content. Compare with cereal bars for CHO content & energy. NOTE: may need 2 cereal bars to equal calories of 1 energy bar.

❑ **Energy replacement drinks:** These beverages are for consumption after strenuous activity. They help replace muscle energy stores - especially in the 1st 15 minutes after activity. A ratio of 3 gm of CHO per 1 gm of protein is ideal. Look for CHO:protein of 3:1 and good taste. Compare to chocolate milk. NOTE: may need more chocolate milk to equal the calories/energy in a replacement beverage.

Product & amount: (compare equal size or volume)		
Calories/energy:		
Carbohydrate: (content & concentration)		
Protein: (in replacement drink)		
Price: (per equal volume/amount)		
Taste:		

Which would you buy? _____

Why? _____

Action Plan

Plan One	Plan Two	Plan 3
For athletes such as gymnasts, divers, synchronized swimmers	For most athletes	For the endurance athlete, e.g. a road racing cyclist, cross country runner or triathlete

Food Group			Food Guide Servings	Food Guide Servings	Food Guide Servings
Vegetables & Fruit	Females	13 years	6	8+	15+
		14-18 years	7	8+	15+
	Males	13 years	6	8+	15+
		14-18 years	8	8+	15+
Grain Products	Females	13 years	6	8+	15+
		14-18 years	6	8+	15+
	Males	13 years	6	8+	15+
		14-18 years	7	8+	15+
Milk & Alternatives	Females	13 years	3-4	3-4	3-6
		14-18 years	3-4	3-4	3-6
	Males	13 years	3-4	3-4	3-6
		14-18 years	3-4	3-4	3-6
Meat & Alternatives	Females	13 years	1-2	2	2-4
		14-18 years	2	2	2-4
	Males	13 years	1-2	2	2-4
		14-18 years	3	3	2-4

CARBOHYDRATE

WHERE DO WE FIND IT?

Found in 2 forms in food:

SUGAR (SIMPLE)	STARCH (COMPLEX)
Fruit	Cereal
Fruit juices	Bread
Milk	Potatoes
Table sugar	Vegetables
Syrup/honey	Pasta/rice
Jam/jelly	Peas/beans/lentils
Candy	

Starchy Carbohydrates - good source of fibre

CARBOHYDRATE

HOW IS IT USED IN THE BODY?

CARBOHYDRATE
(most important source of food energy for exercise)

↓

GLUCOSE

↓ Circulates in the blood to provide energy to cells

↓ Stored as glycogen in muscles & liver

↓ Excess is converted to fat

PROTEIN

WHERE CAN WE GET IT?

AMINO ACIDS

- Building blocks of protein
- 20 common amino acids
- 9 are essential because the body cannot make them and they must be obtained from food

COMPLETE PROTEIN

- Animal sources
- Contains all of the essential amino acids

INCOMPLETE PROTEIN

- Plant sources
- Poor ratio of essential amino acids
- Complement with other plant protein
- Combine with animal protein to provide all the essential amino acids in sufficient amounts

PROTEIN

HOW DOES OUR BODY USE IT?

It is part of all body tissues (e.g. muscle, skin, hair)

- To maintain and repair body tissues
- To make hemoglobin, which carries oxygen to cells
- To form antibodies in the bloodstream that fight off infection and disease
- To produce enzymes and hormones that regulate body processes
- Used as energy, if CHO stores are depleted

WATER… an athlete's best friend

- Forms blood plasma
- Carries nutrients and oxygen
- Removes waste
- Facilitates cooling

Before Activity

- Be well hydrated, drink at least 2 cups before start of long event

During Activity

- Drink ½-1 cup every 15 minutes

After Activity

- Drink 3 cups for every pound lost