# VEGETARIAN WAYS OF EATING:
## FINDING THE NUTRIENTS

There are many styles of vegetarian eating. Three of these are:

✔ **SEMI-VEGETARIAN**

**Description**: May exclude certain animal products, e.g., red meat, milk products.

**Nutrients of concern**: Iron, zinc, protein, calcium, riboflavin, vitamin D, omega-3 fats, iodine.

✔ **LACTO-OVO-VEGETARIAN**

**Description**: Eats milk products and eggs; no meat, fish, or poultry.

**Nutrients of concern**: Iron, zinc, protein, omega-3 fats.

✔ **VEGAN**

**Description**: Does not eat animal products.

**Nutrients of concern**: Protein, iron, zinc, calcium, vitamin D, riboflavin, vitamin $B_{12}$, omega-3 fats, iodine.

### How can vegetarians plan balanced meals?

Follow "Training Diet: Action Plans" for athletes:

✔ **Vegetables and fruit** (5–15+ servings)

✔ **Grain products** (5–15+ servings)

✔ **Milk and alternatives** (or calcium alternatives) (3–6 servings)

✔ **Meat alternatives** (2–4 servings) – legumes (soy products, tofu, cooked dried beans, peas, lentils), nuts/nut butter, seeds, eggs.

Or abide by the guidelines of "A New Food Guide for North American Vegetarians" available from www.dietitians.ca (Resource Centre, Position Papers, Vegetarian Diets: Vegetarian Food Guide for North America). Be aware that "A New Food Guide for North American Vegetarians" uses different serving sizes than "Canada's Food Guide" and is targeted at the general population rather than athletes. Well-planned vegetarian diets can meet the needs of athletes. Diets that provide sufficient energy for growth and exercise, and contain a variety of plant-based protein foods (soy products, other legumes, grains, nuts and seeds) can provide adequate protein without the use of special foods or protein supplements.

For adolescent athletes, plan meals and snacks to ensure energy, protein, calcium, iron, zinc, vitamin D and vitamin $B_{12}$ needs are met. Female vegetarian athletes need adequate energy, protein, higher levels of fat, and generous amounts of calcium and iron. In some cases, fortified foods and/or supplements may be needed to meet nutrient requirements.

Vegan athletes may have difficulty eating the volume of plant food necessary to obtain such nutrients as protein, iron, zinc, calcium, riboflavin, vitamin $B_{12}$, and vitamin D. Phytates and oxalates are substances found naturally in many plant sources and they may interfere with the absorption of calcium, iron, and zinc. Cross train your diet – eat a variety of foods.

### SPECIFIC CONCERNS

Refer to the "Training Diet: Everyday Eating" program, for the nutrient needs of athletes.

### Energy

Food is fuel. Be sure you eat enough. Plant foods can be filling. Weight loss and/or fatigue suggest inadequate energy intake.

For concentrated energy sources, try:

✔ Nuts, seeds, peanut butter, avocado, dried fruit, and fruit juices.

✔ Non-hydrogenated margarine, butter, oil, and/or nut butters added to grain products and vegetables.

✔ Legumes: soy/tofu, split peas, chickpeas, beans (kidney, black, baked), lentils, peanuts.

### Protein

Vegetarians need 10% more protein to ensure they get all the essential amino acids required each day. Plant protein can meet athletes' requirements when a variety of plant foods is consumed and energy needs are met. In spite of this, growing active vegetarians are more likely to meet their protein requirements by combining plant protein sources such as grains and legumes or adding animal products such as milk, fish, or egg.

Try the following protein combinations:

✔ **Grains + legumes** = rice-bean casserole; pita with hummus; rice and tofu; veggie burger/dog with bun; tortilla with beans; toast and peanut butter.

✔ **Grains + nuts/seeds** = almond vegetable stir-fry on rice; pasta with pine nuts; bagel and almond butter.

✔ **Grains + animal protein** = cereal with milk; egg or cheese sandwich; macaroni/pasta and cheese; tuna with crackers.

For each serving, aim for 14–21 g protein. Some protein examples:

**PLANT SOURCES**: 175 mL (¾ cup) cooked dried beans or peas, or canned beans, peas or lentils, baked beans, black-eyed peas, chickpeas, pinto beans = 12–13 g protein; 175 mL (¾ cup) soy beans = 17 g protein; 150 g (¾ cup) tofu = 12-23 g protein; 125 mL (½ cup) nuts or seeds = 8–14 g protein; 60 mL (4 Tbsp) peanut butter = 12–13 g protein.

SNAC Sport Nutrition Advisory Committee
Comité consultatif sur la nutrition sportive

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### Protein (continued)

Check product labels for more details about veggie wieners, burgers, and other meat substitutes.

**ANIMAL SOURCES**: 2 large eggs = 13 g protein; 125 mL (½ cup) cottage cheese = 16 g protein; 50 g (1.5 oz.) cheddar cheese = 8–13 g protein; 75 g (2.5 oz.) cooked fish = 18 g protein.

For more information regarding the protein content of food, see the Nutrition Tip Sheet "Protein Pointer".

### Iron

The recommended iron intake for vegetarians is 1.8 times that of non-vegetarians because of the lower bioavailability of iron from plant sources compared to animal sources. In addition, iron from some vegetables such as spinach and beets is not readily absorbed because they contain oxalates which bind the iron.

A lack of iron leads to fatigue and decreased performance. Animal sources are absorbed best.

**PLANT SOURCES**: legumes, enriched cereals/breads, cream of wheat, dark green leafy vegetables, nuts, dried fruit, blackstrap molasses, tofu. Consuming a source of vitamin C with your meal (e.g., oranges, grapefruit, lemon, tomatoes, green peppers, strawberries, cantaloupe) will improve the absorption of iron from plant foods. Regular or decaffeinated tea and coffee may interfere with iron absorption.

**ANIMAL SOURCES**: clams, oysters, mussels, fish.

For more information regarding the iron content of food, see the Nutrition Tip Sheet "Iron Indicator".

### Zinc

Zinc is important for growth, immunity, wound healing, and taste perception. Zinc is better absorbed from animal sources compared to plant sources.

**PLANT SOURCES**: whole grains, seeds. Processing can break down the phytates and improve both iron and zinc absorption; e.g., soaked legumes, yeast breads, roasted nuts/seeds, sprouted seeds (bean sprouts, alfalfa sprouts, etc.), ground seeds.

**ANIMAL SOURCES**: oysters, fish, milk products, egg.

### Calcium

Calcium is necessary for strong bones and teeth. Calcium deficiency may contribute to stress fractures and early osteoporosis. Vitamin D is needed for calcium absorption. A person can absorb calcium more easily from some foods than from others. Teens need 1300 mg calcium daily and adults need 1000 mg calcium per day. Vegans may need fortified foods and supplements to meet their calcium needs.

Food sources containing 300 mg calcium:

**PLANT SOURCES**: 250 mL (1 cup) calcium fortified soy beverage; 250 mL (1 cup) calcium fortified orange juice; about 150 g (varies) firm tofu (calcium set); 750 mL (3 cups) cooked beans; 175 mL (¾ cup) tahini; 500 mL (2 cups) cooked turnip greens, Chinese cabbage (bok choy); 750 mL (3 cups) cooked kale; 1,000 mL (4 cups) broccoli; 175 mL (¾ cup) almonds; 10 dried figs; 6 oranges; 30 mL (2 Tbsp) blackstrap molasses.

**ANIMAL SOURCES**: 250 mL (1 cup) milk; 175 mL (¾ cup) yogurt; 50 g (1.5 oz.) cheese; 130 g (4.6 oz.) canned salmon with bones.

For more information regarding the calcium content of food, see the Nutrition Tip Sheet "Calcium Counter".

### Vitamin D

The "sunshine" vitamin is important for calcium absorption and proper bone formation. In Canada, from November until March, the body cannot manufacture adequate vitamin D from sunlight exposure. Vitamin D is added to milk, fortified soy/rice beverage and a few brands of yogurt but not to cheese.

**PLANT SOURCES**: Vitamin D fortified soy beverage, fortified rice beverage, fortified margarine.

**ANIMAL SOURCES**: fortified milk, oily fish (e.g., salmon, sardines). Athletes who live in Canada during the winter, who train indoors, who train fully covered (skiers), or who have dark skin will need a vitamin D supplement.

### Riboflavin

Like other B vitamins, riboflavin is important for the release of energy from food.

**PLANT SOURCES**: bean sprouts, green peas, seaweed, spinach, nutritional yeast, almonds, mushrooms, cooked soybeans, fortified soy beverage.

**ANIMAL SOURCES**: milk and alternatives, egg.

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### Vitamin $B_{12}$

Vitamin $B_{12}$ is important for a healthy nervous system, red blood cells, and cell division. It is essential during pregnancy for fetal development. It is also involved in the body's breakdown of fat and protein. This vitamin is found only in animal products or $B_{12}$ fortified plant products.

**PLANT SOURCES**: include at least 3 good food sources of vitamin $B_{12}$ in your diet every day: 1 cup (250 mL) fortified soy beverage, ½ cup (125 mL) cow's milk, ¾ cup (185 mL) yogurt, 1 large egg, 1 ounce (28 g) fortified breakfast cereal, 1.5 oz (42 g) fortified soy product, 1 Tbsp (15 mL) nutritional yeast (Red Star Vegetarian Support Formula). Available in health food stores, nutritional yeast can be sprinkled on salads, pastas, and casseroles. Unless fortified, no plant food (including sea vegetables and spirulina) contains significant amounts of active vitamin $B_{12}$. If you don't eat at least 3 servings per day of the above foods, take a daily vitamin $B_{12}$ supplement of 5–10 µg or a weekly $B_{12}$ supplement of 2000 µg.

**ANIMAL SOURCES**: Milk and alternatives, eggs, fish.

### Vitamin A/beta-carotene

Vitamin A is important for eye sight, healthy skin and tissues, immune function, and cell division. Preformed vitamin A is found only in animal products. While vegans get some vitamin A from converting beta-carotene, research suggests that absorption of beta-carotene from plant foods is less efficient than previously believed.

**PLANT SOURCE OF BETA-CAROTENES**: deeply coloured yellow or orange vegetables, leafy green vegetables, or yellow fruits (apricots, cantaloupe, mango, pumpkin). Cooking and/or adding a small amount of fat to meals can increase beta-carotene absorption.

**ANIMAL SOURCES OF VITAMIN A**: milk and alternatives, eggs, and fish oil.

### Omega-3 fats

Omega-3 fats are essential polyunsaturated fatty acids, needed for the development and health of the brain, eyes, heart, and immune system. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are more active than the shorter alpha-linolenic acid form. Include two servings every day of foods that supply omega-3 fats.

**PLANT SOURCES**: alpha-linolenic acid can be consumed from ground flaxseed, flaxseed oil, canola oil, soybean oil, cooked soybeans, tofu, walnuts, and walnut oil. EPA and DHA can be obtained from microalgae and large amounts of sea vegetables.

**ANIMAL SOURCES**: fish, "omega-3" eggs, and milk products.

### Iodine

The thyroid gland needs iodine to produce thyroxine – a hormone to regulate basal metabolic rate and growth. Table salt has been fortified with iodine to ensure adequate iodine. The RDA is supplied by 2.5 mL (½ tsp) iodized salt. Soybeans, plants from the cabbage family (broccoli, brussels sprouts, cabbage, cauliflower, turnip) and sweet potatoes bind iodine and limit its availability. These foods are only a concern if you consume no iodine. (Sea salt and kosher salt do not contain iodine.)

**PLANT SOURCES**: iodized salt, sea vegetables, plants grown in soil rich in iodine.

**ANIMAL SOURCES**: seafood, milk.

***Check labels for nutrient content!***

For more information, contact a Sport Nutritionist from the CAC Sport Nutrition Registry or Registered Dietitian with sport knowledge. You can contact the dietitian at your Canadian Sport Centre or someone listed under the Sport Nutrition Registry on the CAC website. If there is no dietitian listed in your area, Dietitians of Canada may list a dietitian near where you live.

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