Appendix B
Glossary

Cellulose. Cellulose, a polysaccharide consisting of linear β-(1,4)-linked glucopyranoside units, is the main structural component of plant cell walls. Humans lack digestive enzymes to cleave β-(1,4) linkages and thus cannot absorb glucose from cellulose.

Chitin and Chitosan. Chitin is a polysaccharide analogous in chemical structure to cellulose except that the repeating unit is a (1,4)-linked N-acetyl-D-glucosamine, a compound consisting of glucose derivative units joined to form a long, unbranched chain. Chitosan is the N-deacetylated product of chitin. Both chitin and chitosan are main constituents of the exoskeletons of many arthropods. They are also found in structures of invertebrate organisms and the cell walls of most fungi.

Chondroitin Sulfate. Chondroitin sulfate consists of repeating units of glucuronic acid linked to N-acetyl-D-galactosamine. It is a major constituent of various connective tissues and can be found particularly in blood vessels, bone, and cartilage.

Cutin. Cutin is a waxy, water-repellent substance that is the major component of the cuticle, a protective layer covering the plant epidermal cells exposed to the environment above ground.

Degrees of Polymerization. Degrees of polymerization is the number of anhydromonosaccharide units in a polysaccharide.

Dextrins. Partial degradation products of starch digestion that are fully digestible in the human small intestine. Sometimes referred to as maltodextrins. Dextrins are not to be confused with resistant maltodextrins.

Fructan. Fructan is a general term for any carbohydrate consisting of linear or branched fructose polymers that constitute the majority of the glycosidic units.

Fructooligosaccharide. See oligofructose.

Galactooligosaccharide. Galactooligosaccharides are nondigestible oligosaccharides (3 to 10 degrees of polymerization) composed of galactose units that escape digestion in the stomach and small intestine and arrive in the colon.

Gums. Gums consist of a diverse group of water soluble polysaccharides usually isolated from seeds and typically viscous in aqueous solution.

Hemicelluloses. Hemicelluloses are a group of polysaccharides found in plant cell walls that surround the cellulose fibers. These polymers can be linear or branched and consist of glucose, arabinose, mannose, xylose, and galacturonic acid.

Hydrocolloid. Synonym for gum (e.g., guar gum, locust bean gum, and gum arabic). Hydrocolloids are widely used in small amounts as food additives to modify textural, water retention, and rehydration properties.

Intact. As used in the definition of *Dietary Fiber*, intact is defined as having no relevant component removed or destroyed (Gove, 1967).

Intrinsic. As used in the definition of *Dietary Fiber*, intrinsic is defined as originating and included wholly within (Gove, 1967).

Inulin. Inulin is a β-(2,1)-linked fructose polymer usually terminated by a glucose unit that was originally isolated from dahlia tubers. It is a naturally occurring component of plants such as chicory and Jerusalem artichoke.

Lectins. Lectins are proteins with sugar-binding sites that can agglutinate cells and/or precipitate molecules that contain carbohydrate.

Lignin. Lignin is a highly-branched polymer comprised of phenylpropanoid units and is found within "woody" plant cell walls, covalently bound to fibrous polysaccharides.

Maillard Reaction Products. Maillard reaction products are produced by one form of nonenzymatic browning in which the carbonyl groups of acyclic sugars interact with free amino groups of amino acids. This occurs when the carbohydrate solution becomes neutral or weakly alkaline, which favors the acyclic carbonyl forms of reducing sugars.

Mixed Linkage β-Glucans. Mixed linkage β-glucans are homopolysaccharides of branched glucose residues. These β-linked D-glucopyranose polymers are

constituents of fungi, algae, and higher plants and include mixed linkage β-glucans in cereals.

Modified Cellulose. Modified cellulose is produced by treatment of cellulose fibers, obtained from cotton linters or wood pulp, yielding cellulose derivatives such as methyl ether or hydroxypropyl ether of cellulose.

Mucilage. Mucilage is a thick, viscous plant cell product, and the term is usually applied to plant gums.

Nondigestible. Nondigestible is an adjective that implies a substance is not broken down to simpler chemical compounds in the living body chiefly through the action of secretion-containing enzymes such as the saliva and the gastric, pancreatic, and intestinal juices in the alimentary canal of higher animals (Gove, 1967).

Nonstarch Polysaccharide. Polymeric fraction of fiber that includes all polysaccharides and excludes lignin and all starch. Nonstarch polysaccharide is typically a mixture of cellulose, hemicellulose, pectins, and gums.

Novel Fibre. Health Canada has defined novel fibre as a food that has been manufactured to be a source of dietary fiber and: has not traditionally been used for human consumption to any significant extent; or has been chemically processed (e.g., oxidized) or physically processed (e.g., very finely ground) so as to modify the properties of the fibre; or has been highly concentrated from its plant source. It must be demonstrated that a novel fibre is safe and that it functions physiologically as dietary fiber for it to be considered a source of dietary fiber.

Oligofructose. Oligofructose, also known as fructooligosaccharide, is the hydrolysis product of inulin and consists of 3 to 5 units comprised of fructose with a terminal glucose unit. Oligofructose, which is produced by the action of the fungal enzyme β-fructofuranosidase on inulin, can be found naturally in plants such as onions.

Oligosaccharides. Oligosaccharides are compounds containing 2 to 10 monosaccharides of the same or varying sugar units linked in a linear or branched chain. The division between oligosaccharides and polysaccharides is somewhat arbitrary, with the upper limit of size for oligosaccharides varying from 7 to 15 sugar residues. Examples of intrinsic oligosaccharides are stachyose, raffinose, and verbacose found in legumes and oligofructose in onions.

Pectins. Pectins, which are found in cell wall and intracellular tissues of many fruits and berries, consist of galacturonic acid units with rhamnose interspersed in a linear chain. Pectins frequently have side chains of neutral sugars, and the galactose units may be esterified with a methyl group, a feature that allows for the viscosity of an aqueous solution of pectin.

Phytate. Phytate (inositol hexaphosphate) is typically found in the outer layers of cereal grains and can decrease the absorption of trace elements in the intestine.

Polydextrose. Polydextrose is a glucose polymer produced under vacuum at a high temperature in the presence of a food acid catalyst with sorbitol as a plasticizer. It is commonly used as a bulking agent and sometimes as a sugar substitute.

Psyllium. Psyllium refers to the husk of psyllium seeds and is a very viscous mucilage in aqueous solution. The psyllium seed, also known as plantago or flea seed, is small, dark, reddish-brown, odorless, and nearly tasteless. *P. ovata*, known as blond or Indian plantagoa seed, is the species from which husk is usually derived. *P. ramosa* is known as Spanish or French psyllium seed.

Resistant Maltodextrin. Resistant maltodextrins are largely an indigestible mixture of oligo- and polysaccharides manufactured by pyrolysis and subsequent enzymatic treatment of cornstarch.

Resistant Starch. Resistant starch comprises starch and starch degradation products not digested and absorbed in the small intestine of humans. Resistant starch consists of starch not physically accessible to digestive enzymes, cooked starch in granules not accessible to digestion unless the granules are gelatinized by heating, and retrograded amylose that has been rendered resistant to enzymatic hydrolysis by processing or by cooking and cooling.

Saponin. Saponin is any plant glycoside that can be hydrolyzed to produce a carbohydrate and a sapogenin, a steroid or a triterpene component. The carbohydrate may be glucose, galactose, or a methylpentose.

Sorbitol. Sorbitol is a sugar alcohol formed by reduction of the carbonyl (aldehyde) group of glucose.

Tannins. Tannins (or tannic acid) occur naturally in many parts of plants including the roots, wood, bark, leaves, and fruit. They are responsible for the astringent taste, flavor, and color of many varieties of coffee and tea.

Viscous. A viscous compound is liquid-like but is thick and therefore has a resistance to flow.

Wax. Waxes are pliable substances that are less greasy, harder, more brittle, and contain compounds of higher molecular weight than fats. They can originate from plant, animal, mineral, or synthetic sources.