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Food, Nutrients and Health:

Interim Evidence Update

2018

For Health Professionals
and Policy Makers



Canada 

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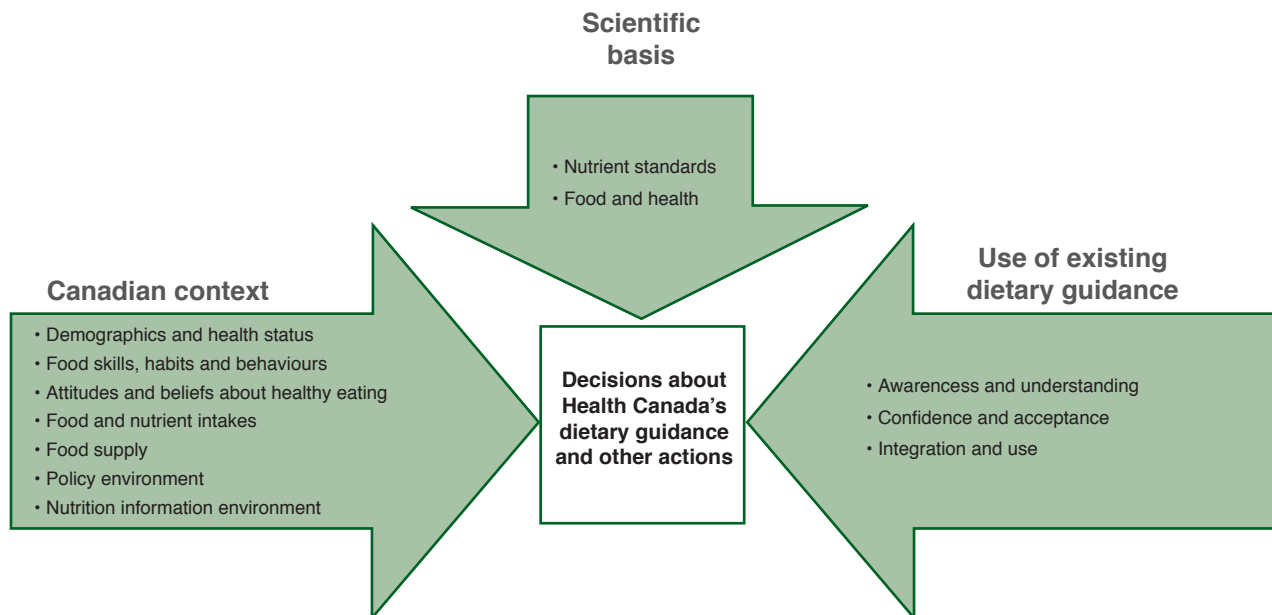
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The Evidence Review Cycle for Dietary Guidance (ERC) is Health Canada’s ongoing systematic approach to gathering, assessing, and analyzing scientific evidence relevant to dietary guidance. This process helps to ensure that dietary guidance from Health Canada on healthy eating, such as Canada’s Food Guide, remains scientifically sound, current, relevant, and useful. The ERC examines evidence in three key input areas that inform dietary guidance: **Scientific Basis**; **Relevance in the Canadian Context**; and **Use of Existing Dietary Guidance** (Figure 1). The current Food, Nutrients and Health: Interim Evidence Update 2018 focuses specifically on one of the key areas of the ERC—the Scientific Basis. It aims to:

1. ensure that dietary guidance from Health Canada is developed using the latest scientific evidence;
2. maintain credibility in Health Canada’s approach to gathering evidence on relationships between food, nutrients and health;
3. provide an overview of evidence on convincing relationships between food, nutrients and health gathered between July 2015 and November 2018;
4. summarize the state of the evidence on convincing relationships between food, nutrients and health gathered between January 2006 and November 2018.

A brief summary of the methodology for the evidence review process of the scientific basis is described in **Annex 1**. When developing dietary guidance, Health Canada uses convincing findings that are supported by a well-established evidence base and are unlikely to change in the foreseeable future as new scientific evidence emerges. **Annex 2** provides an overview of evidence on convincing relationships between food, nutrients and health gathered between July 2015 and November 2018. **Annex 3** summarizes the state of the evidence on convincing relationships between food, nutrients and health gathered between January 2006 and November 2018.

Figure 1: Key input areas to inform decisions about dietary guidance



Annex 1: Summary of the Evidence Review Process Methodology

Health Canada used the methodology outlined in the 2015 [Evidence Review for Dietary Guidance: Technical Report](#).¹ The outcomes of interest were chronic diseases/conditions of public health concern in Canada—as identified in the 2015 evidence review—specifically: cancer (various types), cardiovascular disease/coronary artery disease (including hypertension, dyslipidemia and stroke), obesity (including adiposity and weight gain), osteoporosis (including bone health and fractures), and type 2 diabetes. The following health outcomes were added to the evidence review process since 2015 based on expert reviewer suggestions:

- All-cause mortality
- Metabolic syndrome
- Oral health

In addition, since 2015, there has been an increase in the overall amount of credible evidence. As a result, recent reports generally provide greater detail on food, nutrients and health relationships (for example, specificity of health outcomes, identification of thresholds in the level of exposure to a food or nutrient, stratification of exposures by demographic variables, etc.). Health Canada has refined its approach to gathering and assessing the evidence to accurately reflect the food, nutrients and health relationships provided in more recent reports.

Annex 2: How has Health Canada’s General Understanding of Food, Nutrients and Health Relationships Changed Since 2015?

The 2015 [Evidence Review for Dietary Guidance: Technical Report](#)¹ included a review of 27 reports²⁻²⁸ published between January 2006 and July 2015 by federal agencies and leading scientific organizations. Since 2015, an additional 33 reports²⁹⁻⁶¹ were reviewed. A total of 47 reports^{2,4-15,24-49,54-61} were retained for this Interim Evidence Update as 13 reports^{3,16-23,50-53} published between 2006 and 2015 were superseded by updated reports published since 2015.

Consistent convincing evidence

Most of the convincing evidence reviewed since 2015 re-affirmed Health Canada’s understanding of food, nutrients and health relationships. For example, the following convincing evidence is **consistent** with previous convincing evidence captured in the 2015 [Evidence Review for Dietary Guidance: Technical Report](#)¹:

Alcohol:

- **Alcohol** intake and increased risk of liver, oesophageal (squamous cell carcinoma), mouth, pharynx and larynx, colorectal, and breast (post-menopausal) cancer.^{36,43,44,47,49}

Fats:

- **Replacement of saturated fat with carbohydrate** and improved blood lipid levels.⁵⁶
- **Replacement of saturated fat or trans fat with unsaturated fat** (polyunsaturated or monounsaturated) and improved blood lipid levels **in adults**.^{56,57}
- **Replacement of trans fat with unsaturated fat** (polyunsaturated or monounsaturated) and improved blood lipid levels **in adults**.⁵⁷

Fibre:

- **Dietary fibre** and improved blood lipid levels.³⁴

Meat and meat alternatives:

- Diets high in **soy protein** and lowered low-density lipoprotein (LDL) cholesterol.³²
- **Processed meat** intake and increased risk of **colorectal** cancer.^{29,49}

Patterns:

- **Healthy dietary patterns** and lowered LDL cholesterol and cardiovascular disease risk.³²

Sugars:

- Intake of **sugar-sweetened drinks** and increased risk of weight gain, overweight and obesity.⁶⁰

New convincing evidence

Some of the convincing evidence reviewed since 2015 added to our understanding of food, nutrients and health relationships. For example, there is **new** convincing evidence for the following food, nutrients and health relationships:

Carbohydrates:

- Diets **higher in carbohydrate and lower in fat and/or protein** and improved blood lipid levels.³⁴

Fats:

- Increased intake of **polyunsaturated fat** and improved blood lipid levels.^{31,33,54}
- **Replacement of saturated fat with unsaturated fat** (polyunsaturated or monounsaturated) and improved blood lipid levels **in children**.⁵⁵
- **Decreased saturated fat** intake in children and improved blood lipid levels, lower blood pressure and lower risk of obesity.⁵⁵
- **Replacement of trans fat with carbohydrate** and improved blood lipid levels.⁵⁷

Fibre:

- **Dietary fibre** and decreased risk of **colon** cancer, cardiovascular diseases and type 2 diabetes.³⁴

Glycemic Index/Load:

- Higher **glycemic index or glycemic load** and increased risk of type 2 diabetes.³⁴

Meat and meat alternatives:

- Diets high in **nuts** and lowered LDL cholesterol.³²
- **Processed meat** intake and increased risk of cancer.²⁹

Sugars:

- Intake of **sugars-containing beverages**, including 100% fruit juice, and increased risk of dental decay in children.³⁴
- Increased intake of **sugars** and increased risk of excess energy intake leading to weight gain.³⁴

No longer convincing evidence

Occasionally, some relationships are **no longer convincing**, which also has important implications for dietary guidance. For example, since 2015, the evidence grade changed from 'convincing' to 'probable' for the following food, nutrients and health relationships:

Fibre:

- **Dietary fibre** (total fibre and fibre found in fruits and vegetables as well as whole grains) and decreased risk of **colorectal** cancer.⁴⁹

Meat and meat alternatives:

- **Red meat** intake and increased risk of colorectal cancer.⁴⁹

Annex 3: Summary of Convincing (strong) Food and Health Relationships and Changes Since 2015

PREDICTOR	OUTCOME (SPECIFIC OUTCOME OR RISK FACTOR)	DIRECTION OF RISK ^{†, ††}	SOURCE (# OF FINDINGS)	CHANGES IN CONVINCING EVIDENCE SINCE 2015 [*] , ^{**} , ^{***}
Alcohol				
Alcohol	Cancer (Colorectal; Breast - postmenopausal; Oesophageal - squamous cell carcinoma; Liver; Mouth, pharynx, larynx)	Increased	WCRF, 2018 ⁴⁹ (1); WCRF, 2018 ³⁶ (1); WCRF, 2018 ⁴⁴ (1); WCRF, 2018 ⁴³ (1); WCRF, 2018 ⁴⁷ (1)	No change
Alcohol (Moderate drinking)	CVD (CHD)	Decreased	DGAC, 2010 ⁵ (1)	No change
Carbohydrates				
Diets higher in carbohydrate, lower fat	CVD (Blood lipids: TC)	Decreased	SACN, 2015 ³⁴ (1)	New finding
Diets higher in carbohydrates, lower fat & average protein	CVD (Blood lipids: LDL; TC)	Decreased	SACN, 2015 ³⁴ (2)	New finding
Diets higher in carbohydrate, differing in the proportion of fat and protein ^a	CVD (BP: SBP; DBP); CVD (Blood lipids: CRP; NEFA; LDL; HDL)	No effect	SACN, 2015 ³⁴ (11)	New finding
Diets higher in carbohydrate and/or lower fat and average protein ^a	Overweight/Obesity (Body weight; Energy intake)	No effect	SACN, 2015 ³⁴ (2)	New finding
Diets higher in carbohydrate, differing in the proportion of fat and protein ^a	T2D (A1c; Fasting insulin; FBG; OGTT)	No effect	SACN, 2015 ³⁴ (7)	New finding
Total carbohydrate intake	Cancer (Colorectal; Colon; Rectal)	No association	SACN, 2015 ³⁴ (3)	New finding
Dietary Behaviours				
Fast food	Overweight/Obesity (Weight gain, overweight, obesity)	Increased	DGAC, 2010 ⁵ (1)	No change
Dietary patterns				
DASH combined with independent lowered sodium intake	CVD (BP: SBP & DBD)	Decreased	ACC/AHA, 2013 ² (1)	No change
Dietary pattern ^p	CVD	Decreased	DGAC, 2015 ⁴ (1)	No change
Dietary pattern higher in vegetables, fruits, & whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils, & nuts; & limits intake of sweets, SSBs, & red meats	CVD (Blood lipids: LDL); BP (SBP, DBP)	Decreased	ACC/AHA, 2013 ² (2)	No change
Mediterranean	CVD	Decreased	CCS, 2016 ³² (1)	No change
Macronutrient profiles that contain 5% to 6% saturated fat, 26% to 27% total fat, 15% to 18% protein, & 55% to 59% carbohydrate	CVD (Blood lipids: LDL)	Decreased	ACC/AHA, 2013 ² (1)	No change
Steps I and II diets from the US National Cholesterol Education Program	CVD (Blood lipids: LDL)	Decreased	CCS, 2016 ³² (1)	No change

PREDICTOR	OUTCOME (SPECIFIC OUTCOME OR RISK FACTOR)	DIRECTION OF RISK ^{†, ††}	SOURCE (# OF FINDINGS)	CHANGES IN CONVINCING EVIDENCE SINCE 2015 [*] , ^{**} , ^{***}
Fats				
PUFA (EPA & DHA &/or DPA)	All-cause mortality	No association	AHRQ, 2016 ³¹ (1)	New finding
PUFA (EPA & DHA &/or DPA)	CVD (Blood lipids: TG; TC:HDL ratio)	Decreased	AHRQ, 2016 ³¹ (2)	New finding
PUFA (EPA &/or DHA)	CVD (Blood lipids: TG)	Decreased	HC, 2016 ³³ (1)	New finding
PUFA (EPA & DHA &/or DPA)	CVD (Blood lipids: LDL; HDL)	Increased	AHRQ, 2016 ³¹ (2)	New finding
PUFA (EPA & DHA &/or DPA)	CVD (Coronary revascularization; Major adverse CVD event; Sudden cardiac death)	No association	AHRQ, 2016 ³¹ (3)	New finding
PUFA (EPA & DHA &/or DPA)	CVD (BP: SBP & DBP)	No effect	AHRQ, 2016 ³¹ (1)	New finding
PUFA (Long-chain omega-3)	All-cause mortality	No effect	WHO, 2018 ⁵⁴ (1)	New finding
PUFA (Long-chain omega-3)	CVD (Blood lipids: HDL)	No effect	WHO, 2018 ⁵⁴ (1)	New finding
PUFA (Long-chain omega-3)	CVD (Blood lipids: TG)	Decreased	WHO, 2018 ⁵⁴ (1)	New finding
PUFA (Long-chain omega-3)	CVD (Cardiovascular events)	No effect	WHO, 2018 ⁵⁴ (1)	New finding
PUFA (Long-chain omega-3)	Overweight/Obesity (BMI; Body weight)	No effect	WHO, 2018 ⁵⁴ (2)	New finding
PUFA (Type not specified)	CVD (Blood lipids)	Decreased	DGAC, 2010 ⁵ (1)	No change
SFA	CVD (Blood lipids: LDL, TC); T2D (Insulin resistance)	Increased	DGAC, 2010 ⁵ (2)	No change
SFA ^c (Decreased)	CVD (Blood lipids: HDL) – In children	No effect	WHO, 2017 ⁵⁵ (3)	New finding
SFA (Decreased)	CVD (Blood lipids: LDL)	Decreased	ACC/AHA, 2013 ² (1)	No change
SFA ^c (Decreased)	CVD (Blood lipids: LDL; TC) – In children	Decreased	WHO, 2017 ⁵⁵ (6)	New finding
SFA ^c (Decreased)	CVD (BP: DBP) – In children	Decreased	WHO, 2017 ⁵⁵ (2)	New finding
SFA ^c (Decreased)	Overweight/Obesity (BMI; Body weight) – In children	Decreased	WHO, 2017 ⁵⁵ (4)	New finding
SFA (Reduction in diet for those with SFA intakes >10% of total energy)	CVD (Blood lipids: Apo-B) – In children	Decreased	WHO, 2017 ⁵⁵ (1)	New finding
TFA	CVD (CHD risk factors & events)	Increased	FAO, 2010 ⁶ (1)	No change
TFA (Decreased)	CVD (Blood lipids: LDL)	Decreased	ACC/AHA, 2013 ² (1)	No change
Replacement of carbohydrate with:				
MUFA	CVD (Blood lipids: HDL)	Increased	FAO, 2010 ⁶ (1)	No change
Replacement of SFA with:				
Carbohydrate	CVD (Blood lipids: HDL, LDL) ^f	Decreased	FAO, 2010 ⁶ (1)	No change

PREDICTOR	OUTCOME (SPECIFIC OUTCOME OR RISK FACTOR)	DIRECTION OF RISK ^{†, ††}	SOURCE (# OF FINDINGS)	CHANGES IN CONVINCING EVIDENCE SINCE 2015 [*] , ^{**} , ^{***}
Carbohydrate ^c	CVD (Blood lipids: HDL; LDL; TC; LDL:HDL ratio; ApoA-1; Apo-B) ^l	Decreased	WHO, 2016 ⁵⁶ (24)	New finding
Carbohydrate ^c	CVD (Blood lipids: TG; TG:HDL ratio) ^l	Increased	WHO, 2016 ⁵⁶ (8)	New finding
MUFA ^d	CVD (Blood lipids: HDL; LDL; TC; TG; TC:HDL ratio; LDL:HDL ratio; ApoA-1 ^g ; Apo-B) ^e	Decreased	WHO, 2016 ⁵⁶ (29)	No change
MUFA	CVD (Blood lipids: LDL, TC:HDL ratio)	Decreased	FAO, 2010 ⁸ (1)	No change
MUFA ^c	CVD (Blood lipids: LDL; TC; TG) – In children	Decreased	WHO, 2017 ⁵⁵ (3)	New finding
MUFA	CVD (Blood lipids); T2D (Blood lipids)	Decreased	DGAC, 2010 ⁵ (2)	No change
PUFA ^d (LA & ALA)	CVD (Blood lipids: HDL; LDL; TC; TG; TC:HDL ratio; LDL:HDL ratio; TG:HDL ratio; ApoA-1, Apo-B) ^e	Decreased	WHO, 2016 ⁵⁶ (36)	No change
PUFA ^c (Type not specified)	CVD (Blood lipids: HDL) – In children	No effect	WHO, 2017 ⁵⁵ (1)	New finding
PUFA ^c (Type not specified)	CVD (Blood lipids: LDL; TC) – In children	Decreased	WHO, 2017 ⁵⁵ (2)	New finding
PUFA (Type not specified)	CVD (CVD events, coronary mortality)	Decreased	DGAC, 2015 ⁴ (1)	No change
Unsaturated Fatty Acids (PUFA & MUFA from vegetable oils)	CVD (Blood lipids: TC, LDL)	Decreased	HC, 2012 ¹⁰ (1)	No change
Unsaturated Fatty Acids, especially PUFA (Type not specified)	CVD (Blood lipids: TC, LDL)	Decreased	DGAC, 2015 ⁴ (1)	No change
TFA	CVD (Blood lipids: HDL) ^h	Decreased	FAO, 2010 ⁶ (1)	No change
TFA	CVD (Blood lipids: HDL; LDL; TC; ApoA-1; Apo-B) ^{h, i}	Decreased	WHO, 2016 ⁵⁷ (35)	New finding
TFA ^k	CVD (Blood lipids: TG; TC:HDL ratio; LDL:HDL ratio) ^{h, i}	Increased	WHO, 2016 ⁵⁷ (19)	New finding
Replacement of TFA with:				
Carbohydrate ^k	CVD (Blood lipids: Apo-B) ^p	Increased	WHO, 2016 ⁵⁷ (6)	New finding
Carbohydrate ^k	CVD (Blood lipids: LDL; TC; TC:HDL ratio; LDL:HDL ratio; ApoA-1) ^p	Decreased	WHO, 2016 ⁵⁷ (35)	New finding
MUFA ^k	CVD (Blood lipids: HDL) ^{m, o}	Increased	WHO, 2016 ⁵⁷ (7)	New finding
MUFA ^k	CVD (Blood lipids: LDL; TC; TG; TC:HDL ratio; LDL:HDL ratio; Apo-B) ^m	Decreased	WHO, 2016 ⁵⁷ (40)	New finding
PUFA ^k (Type not specified)	CVD (Blood lipids: HDL) ^{m, o}	Increased	WHO, 2016 ⁵⁷ (7)	New finding
PUFA ^k (Type not specified)	CVD (Blood lipids: LDL; TC; TG; TC:HDL ratio; LDL:HDL ratio; ApoA-1; Apo-B) ^{m, o}	Decreased	WHO, 2016 ⁵⁷ (49)	New finding

PREDICTOR	OUTCOME (SPECIFIC OUTCOME OR RISK FACTOR)	DIRECTION OF RISK ^{†, ††}	SOURCE (# OF FINDINGS)	CHANGES IN CONVINCING EVIDENCE SINCE 2015 [*] , ^{**} , ^{***}
Fibre				
Cereal fibre	CVD (Coronary events); T2D	Decreased	SACN, 2015 ³⁴ (2)	New finding
Dietary fibre	Cancer (Colon)	Decreased	SACN, 2015 ³⁴ (1)	New finding
Dietary fibre	CVD (Coronary events; Stroke); T2D	Decreased	SACN, 2015 ³⁴ (3)	New finding
Dietary fibre (From mixed sources)	CVD (Blood lipids: HDL, LDL, TC, TG)	No association	SACN, 2015 ³⁴ (1)	New finding
Diets high in viscous soluble fibre, such as oats	CVD (Blood lipids: LDL)	Decreased	CCS, 2016 ³² (1)	No change
Oat bran or beta-glucan supplementation	CVD (Blood lipids: HDL)	No effect	SACN, 2015 ³⁴ (1)	New finding
Oat bran or beta-glucan supplementation	CVD (Blood lipids: LDL)	Decreased	SACN, 2015 ³⁴ (1)	No change
Oat fibre, barley fibre or β-glucan supplements	Overweight/Obesity (Energy intake)	No effect	SACN, 2015 ³⁴ (1)	New finding
Oat bran or beta-glucan supplementation	T2D (FBG)	No effect	SACN, 2015 ³⁴ (1)	New finding
Single grains (i.e. Beta-glucan oat fibre; Barley grain products; Psyllium fibre); Ground whole flaxseed	CVD (Blood lipids: LDL, TC)	Decreased	HC, 2010 ¹⁴ (1); HC, 2012 ¹¹ (1); HC, 2011 ¹³ (1); HC 2014 ⁹ (1)	No change
Vegetable or fruit fibre	Cancer (Colorectal); T2D	No association	SACN, 2015 ³⁴ (4)	New finding
Glycemic Index/Load				
Glycemic index or glycemic load	Overweight/Obesity (Body weight); Cancer	No association	DGAC, 2010 ⁵ (2)	No change
Glycemic index or glycemic load (Higher)	T2D	Increased	SACN, 2015 ³⁴ (2)	New finding
Glycemic load	T2D	No association	DGAC, 2010 ⁵ (1)	No change
Grain Products				
Whole grains	CVD (Blood lipids: TC, TG); T2D (FBG; Fasting insulin concentration; Insulin sensitivity)	No effect	SACN, 2015 ³⁴ (4)	New finding
Meat and meat alternatives				
Diets high in nuts	CVD (Blood lipids: LDL)	Decreased	CCS, 2016 ³² (1)	New finding
Diets high in soy protein	CVD (Blood lipids: LDL)	Decreased	CCS, 2016 ³² (1)	No change
Processed meat	Cancer (General) [¶]	Increased	IARC, 2018 ²⁹ (1)	New finding
Processed meat	Cancer (Colorectal)	Increased	WCRF, 2018 ⁴⁹ (1)	No change
Soy protein	CVD (Blood lipids: TC, LDL)	Decreased	HC, 2015 ⁸ (1)	No change
Milk and milk alternatives				
Milk & milk products	Overweight/Obesity (Weight control)	No association	DGAC, 2010 ⁵ (1)	No change

PREDICTOR	OUTCOME (SPECIFIC OUTCOME OR RISK FACTOR)	DIRECTION OF RISK ^{†, ††}	SOURCE (# OF FINDINGS)	CHANGES IN CONVINCING EVIDENCE SINCE 2015 [*] , ^{**} , ^{***}
Minerals				
Potassium ^{†, ††}	CVD (Blood lipids: TC)	No effect	WHO, 2012 ²⁷ (2)	No change
Potassium [†]	CVD (BP: Resting SBP)	Decreased	WHO, 2012 ²⁷ (1)	No change
Sodium & salt [†] (Decreased)	CVD (Blood lipids: TC)	No effect	WHO, 2012 ²⁸ (2)	No change
Sodium & salt [†] (Decreased)	CVD (BP: Resting SBP)	Decreased	WHO, 2012 ²⁸ (2);	No change
Sodium & salt (Decreased)	CVD (BP: SBP & DBP)	Decreased	ACC/AHA, 2013 ² (1); DGAC, 2010 ⁵ (1); NHMRC, 2011 ¹⁵ (1)	No change
Sugars				
Added sugars (Food &/or SSBs)	Overweight/Obesity (Obesity); T2D	Increased	DGAC, 2015 ⁴ (2)	No change
Sugar sweetened drinks	Overweight/Obesity (Weight gain, overweight, obesity)	Increased	WCRF, 2018 ⁶⁰ (1)	No change
Sugar-sweetened beverages	Overweight/Obesity (Adiposity) – In children	Increased	DGAC, 2010 ⁵ (1)	No change
Sugars	Overweight/Obesity (Excess energy intake)	Increased	SACN, 2015 ³⁴ (1)	New finding
Sugars-containing beverages (Amount and frequency)	Oral health (Dental caries in deciduous dentition) – In children	Increased	SACN, 2015 ³⁴ (1)	New finding
Sugars-sweetened beverages	Cancer (Colon)	No association	SACN, 2015 ³⁴ (1)	New finding
Supplements				
PUFA (Omega-3)	CVD (CVD events)	No effect	CCS, 2016 ³² (1)	New finding
Vegetables and Fruit				
Fruit and vegetables	CVD (CHD)	Decreased	HC, 2016 ⁷ (1)	No change
Abbreviations				
<p>ACC/AHA: American College of Cardiologists/American Heart Association; AHRQ: Agency for Healthcare Research and Quality; ALA: Alpha-linolenic acid; ApoA-1: Apolipoprotein A-1; Apo-B: Apolipoprotein B; BMI: Body mass index; BP: Blood pressure; CCS: Canadian Cardiovascular Society; CRP: C-reactive protein; CVD: Cardiovascular disease; CHD: Coronary heart disease; DASH: Dietary Approaches to Stop Hypertension; DBP: Diastolic blood pressure; DGAC: Dietary Guidelines Advisory Committee (US); DHA: Docosahexaenoic acid; DPA: Docosapentaenoic acid; EPA: Eicosapentaenoic acid; FAO: Food and Agriculture Organization of the United Nations; FBG: Fasting blood glucose; HC: Health Canada; HDL: High density lipoprotein; IARC: International Agency for Research on Cancer; LA: Linoleic acid; LDL: Low density lipoprotein; MUFA: Monounsaturated fatty acid; NEFA: Non-esterified fatty acid; OGTT: Oral glucose tolerance test; PUFA: Polyunsaturated fatty acid; RCT: Randomized controlled trial; SACN: Scientific Advisory Council on Nutrition (UK); SFA: Saturated fatty Acid; SSB: Sugar-sweetened Beverage; SBP: Systolic blood pressure; T2D: Type 2 Diabetes; TC: Total cholesterol; TFA: Trans fatty acid; TG: Triglyceride; WCRF: World Cancer Research Fund/American Institute of Cancer Research; WHO: World Health Organization.</p>				

Footnotes

* Changes are assessed based on 2015 *Evidence Review for Dietary Guidance: Technical Report*¹.

** No change: Convincing findings gathered since 2015 that do not change Health Canada's understanding of food, nutrients and health relationships or previous convincing findings (i.e. gathered between 2006 and 2015) that remain convincing to this date.

*** **New convincing finding:** Convincing findings gathered since 2015 that added to Health Canada's understanding of food, nutrients and health relationships or findings that became convincing since 2015 (for example, the evidence grade changed from probable to convincing).

† No association: There is convincing evidence (mainly from observational cohort studies) that there is no association between the predictor (i.e. food or nutrient) and the specific outcome or risk factor of interest.

†† No effect: There is convincing evidence (from RCTs) that there is no effect between the predictor (i.e. food or nutrient) and the specific outcome or risk factor of interest.

^a Examined effects in diets with various proportions of carbohydrates, fats or proteins.

^b Dietary pattern characterized by higher consumption of vegetables, fruits, whole grains, low-fat dairy, and seafood, and lower consumption of red and processed meats, refined grains, and sugar-sweetened foods and beverages. Regular consumption of nuts and legumes and moderate consumption of alcohol also are shown to be components of a beneficial dietary pattern in most studies. Additionally, research that includes specific nutrients in their description of dietary patterns indicate that patterns that are lower in saturated fat, cholesterol, and sodium and richer in fibre, potassium, and unsaturated fats are beneficial for reducing cardiovascular risk.

^c Examined effect of replacement in 3 general population groups: general children population, general children population with intakes >10% of total energy from SFA, and general children population with intakes reduced to <10% of total energy from SFA.

^d Examined effect of replacement in four general population groups: general adult population, general adult population with intakes >10% of total energy from SFA, general adult population with intakes reduced to <10% of total energy from SFA, and general adult population with a starting intake of <10% of total energy from SFA.

^e Effect is the opposite when the unsaturated fatty acid is replaced with SFA in adults with a starting intake of <10% of total energy from SFA.

^f Finding also states no change in TC:HDL ratio.

^g ApoA-1 only convincing for MUFA replaced with SFA in adults with a starting intake of <10% of total energy from SFA.

^h Finding also states increased TC:HDL ratio.

ⁱ Effect is the opposite when TFA is replaced with SFA.

^j Also examined with industrial TFA only and found similar results, with the exception of TG finding not being convincing.

^k Examined effect of replacement in the nine general population groups: reduction in industrial TFA in adults, increase in industrial TFA in adults, reduction in ruminant TFA in adults, increase in ruminant TFA in adults, reduction in TFA in adults, reduction in TFA in adults with intakes >1% of total energy from TFA, reduction in TFA in adults with intakes <1% of total energy from TFA, increase in TFA in adults, increase in TFA in adults with intakes <1% of total energy from TFA.

^l Effect is the opposite when the carbohydrate is replaced with SFA.

^m Effect is the opposite when the unsaturated fatty acid is replaced with TFA.

ⁿ When industrial TFA was examined alone, Apo-B was not convincing.

^o Same findings with just industrial TFA.

^p Effect is the opposite when the carbohydrate is replaced with TFA.

^q This finding is based on evidence demonstrating a causal relationship between the consumption of processed meat and cancer of the colorectum.

^r Examined effect of increased potassium intake relative to a lower intake in adults.

^s Examined effect of an increase in potassium intake to at least 90mmol/day relative to a lower intake in adults.

^t Examined effect of decreased sodium intake relative to a higher intake in adults and the effect of a decrease in sodium intake to <2g/day relative to an intake of ≥2g/day in adults.

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