

Red Meat Nutrition Brief

INTRODUCTION

Meat makes an important contribution to food security and diet quality through the provision of high-quality protein and a variety of essential micro-nutrients – for example, vitamin B₁₂, iron and zinc – that can be difficult to obtain in adequate quantities from plant-source foods alone.

The purpose of this brief is to provide factual information about red meat and beef. Enjoy these wholesome foundational foods to nourish body and soul.

HEALTH CRISIS IN CANADA

Many Canadians are undernourished or overfed. Dietary trends show that obesity rates have soared while the percent of energy from foods naturally rich in high quality protein such as milk, beef and eggs fell. Meanwhile, an increasing percentage of energy from highly processed ready-to-eat foods has replaced energy from more nutritious protein-rich food choices.ⁱ

Growing rates of obesity place the majority of Canadians adults at greater risk of cardiovascular disease, diabetes and cancer. It makes sense to prioritize nutrient-dense foods rich in high quality protein which are modest in calories in an era when the majority of Canadians consume more calories than they should.

| | The Stats | Key Facts |
|----------------------|---|---|
| Obesity | 62% of Canadians (18-79 years) 31% of children and youth (5-17 years) were classified as overweight or obese ⁱⁱⁱ | Evidence suggests that protein-rich foods - like meat - can play an important role in promoting healthy weights due to their beneficial effects on satiety, energy metabolism and body composition. ^{iv} |
| Diabetes | More than half of Canadians with diagnosed diabetes were between 25 and 64 years of age ^v | Diets with increased protein and reduced carbohydrates actually help prevent type 2 diabetes by facilitating fat loss and improve body weight maintenance after weight loss. ^{vi, vii, viii, ix} |
| Heart Disease | 22% of Canadian adults aged 20-79 years had hypertension. ^x | High quality studies consistently show that eating lean beef, as part of a healthy and balanced diet, improves cholesterol and supports heart health. ^{xi} |

MOST CANADIANS CONSUME MODERATE AMOUNTS OF MEAT

Beef and other red meats have been traditional foods for generations. Meat is part of our Canadian culture.

There is a common misconception that red meat is consumed in amounts that exceed recommended levels. In fact, according to Statistics Canada data, meat consumption declined 14 grams between the 2004 and 2015 Canadian Community Health Surveys.^{xii}

Average Grams Per Day 2004 vs 2015

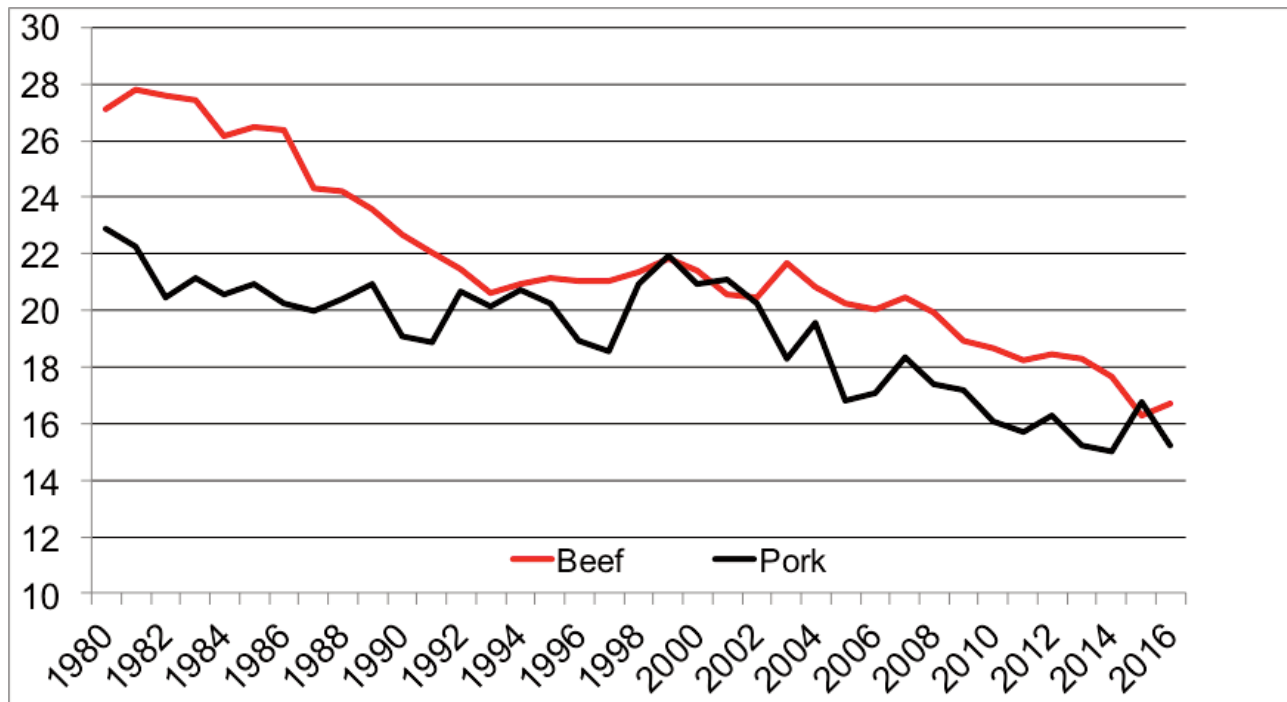
| | 2004 | | | 2015 | | |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Both sexes | Males | Females | Both sexes | Males | Females |
| Fresh red meat ¹ | 53.5 | 68.6 | 38.6 | 41.1 | 52.3 | 30.3 |
| Processed red meat ² | 21.9 | 27.9 | 16.1 | 19.9 | 26.5 | 13.5 |
| TOTAL | 75.4 | 96.5 | 54.7 | 61.0 | 78.8 | 43.8 |

¹ includes beef, veal, pork and lamb including ground meat and burgers

² includes salted beef, bacon (but not turkey or chicken bacon), ham, sausages (not turkey or meatless), and luncheon meats (not considered poultry)

This decline in meat consumption is validated by Statistics Canada's disappearance data, which cites a decline in both beef and pork by 16.7 and 15.2 kilograms per person annually, respectively, since 1980.^{xiii}

Statistics Canada Canadian Meat Disappearance 1980 - 2016



PERCEPTION CANADIANS OVER CONSUME MEAT YET INTAKES ARE WELL WITHIN CANADA'S FOOD GUIDE RECOMMENDATIONS

Most of us would benefit from more whole grains, vegetables and fruits in the diet, but that doesn't mean we must cut back on meat. On average, Canadians are already consuming red and processed meat within the amounts recommended in Canada's Food Guide. On average, Canadians consume less than a serving of fresh meat a day.

Canadian Meat Intake Relative to a Food Guide Serving

| Meat Category | Mean intake for all Canadians (grams/day) | Number of Food Guide servings | Food Guide serving |
|--------------------|---|-------------------------------|--------------------|
| Fresh red meat | 41.1 | just more than half | 75 grams |
| Processed red meat | 19.9 | 1/4 serving | 75 grams |
| Total Red Meat | 61.0 | less than 1 | |

Source: Canadian Community Health Survey 2015

For most people, balance needs to come from swapping refined grains and empty calories for whole grains and vegetables, not reducing meat. The current buzz to eat a plant based diet is an updated version of your mother's advice to eat your veggies.

Meat's high quality protein, iron and zinc strengthen a balanced diet and are a perfect complement to the nutrients found in plant foods.

SOME CANADIANS WOULD BENEFIT FROM EATING MORE MEAT

More than 56% of adolescent males, 48% of women 31-50 years of age and 69% of females older than 70 years of age are consuming less than the recommended number of servings for meat and alternatives. Perhaps not surprisingly, some Canadians – especially women and older citizens - have inadequate intakes of essential nutrients: ^v

Prevalence of inadequate intakes for **iron** was greater than 10% for:

- females 14-50 years of age
- highest prevalence among females 31-50 years old (18%)

Prevalence of inadequate intakes for **zinc** was greater than 10% for:

- males older than 30 years of age
- females 9-50 years of age and older than 70 years of age
- highest prevalence among males and females older than 70 (41% and 25% respectively)

Inadequate intakes of **vitamin B₁₂** most prevalent among females:

- 16% for 14-18 year-olds
- 14% for 31-50 year-olds
- 15% for women over 70 years old

Freshly prepared dishes combining unprocessed or minimally processed foods with processed culinary ingredients and modest amounts of processed foods are the basis of healthy meals.

New research commissioned by the Canadian Heart and Stroke Foundation shows that ultra-processed food consumption in Canada continues to increase and is alarmingly high, accounting for almost half of our daily calorie intake. Ultra-processed foods provided 48% of the total daily energy intake whereas meat and poultry contributed 8% of total energy intake.^{xv}

Most troubling is that young people get more than half their calories from ultra-processed foods – more than any other age group. The highest consumers are kids ages 9–13 who get 57% of their calories from these energy-dense, nutritionally-lacking products. Clearly Canadians have shifted their eating habits away from enjoying whole foods – like meat and vegetables - to highly processed frozen and ready-to-eat foods.

DECIPHERING NEWS HEADLINES ... AND THE SCIENCE BEHIND THEM

Headlines rely on being sensational or they are no longer a headline. Case in point – the buzz that red meat consumption causes colorectal cancer.

No cause and effect has ever been established between any single food and cancer. Much of science relies on observational studies which can only show associations and are not able to draw cause and effect conclusions. It is difficult to disentangle the independent effects of meats, from other diet and lifestyle factors. In 1997 and 2007 the World Cancer Research Fund (WCRF) and in 2015 the International Agency for Research on Cancer (IARC) published reports on diet and cancer linking red meat and processed meat consumption to colorectal cancer.

Subsequently, WCRF's most recent report in 2017, indicated that the association between red meat and colorectal cancer risk is weak and weakening over time. The report identified 13 studies on colorectal cancer incidence that compared high versus low intakes of red meat. None of the 13 studies found statistically significant associations, meaning they can't rule out chance or confounding factors, such as total diet and lifestyle.

WCRF recommends adults eat a maximum of 500 grams, or approximately a pound (cooked weight) of red meat, a week to reduce the risk of colorectal cancer. Most Canadians eat well below that amount. According to the most recent Statistics Canada data, on average, Canadians are consuming 288 grams of fresh red meat, such as beef, pork, lamb and veal, a week. Even men, who we typically consider heavier red meat consumers, on average eat 366 grams a week; women far less at 212 grams.

Mean grams per week

| Meat Category | Both Sexes | Males | Females |
|-----------------------------|------------|-------|---------|
| Fresh red meat ¹ | 288 | 266 | 212 |

¹ includes beef, veal, pork and lamb including ground meat and burgers

Canadians consume one ounce (28 grams) a day, on average, of processed red meat and processed poultry.

Mean grams per day

| Meat Category | Both Sexes | Males | Females |
|---------------------------------|-------------|-------------|-------------|
| Processed red meat ¹ | 19.9 | 26.5 | 13.5 |
| Processed poultry ² | 8.2 | 10.7 | 5.6 |
| TOTAL | 28.1 | 37.2 | 19.1 |

¹ includes salted beef, bacon (but not turkey or chicken bacon), ham, sausages (not turkey or meatless), and luncheon meats (not considered poultry)

² includes chicken nuggets, all chicken wings, patties, and poultry-related sausages and deli meats

The large body of evidence indicates that maintaining a healthy weight, eating a well-balanced diet, being physically active, consuming alcohol in moderation, and not smoking reduces the risk of chronic disease.

RED MEAT: PROTEIN-RICH AND SO MUCH MORE

Many Canadians appear to recognize that increased vegetable and fruit intakes could have important health benefits. However, there appears to be less awareness about the many essential nutrients found in meat including: high quality protein, highly bioavailable iron and zinc, riboflavin, thiamin, niacin, vitamins B₆, and B₁₂.

- Meat provides high quality “complete protein” with all 9 indispensable amino acids in proportions that closely match human needs. Plant proteins tend to have a limited amount of one or more of the indispensable amino acids and are therefore considered “incomplete”.
- Many plant-based proteins, particularly nuts, seeds and legumes, do not meet the conditions for any protein claim (e.g., excellent, high, source, contains) as stated in the Food and Drug Regulations and cannot be referred to as “protein-rich” or even “protein foods.”
- Plant-based protein sources are less protein-dense per serving and calorie contribution. For example, to get the same amount of protein from a 1 serving of beef at 184 calories (75 g - the size of the palm of your hand), one would need to eat 2.5 servings of black beans at 420 calories (1-3/4 cups) or 3.5 servings of peanut butter at 644 calories (7 tablespoons).
- The absorption of the essential minerals iron and zinc is superior from meat compared to absorption from plant sources.
- Meat enhances the absorption of iron from vegetable sources, a phenomenon called the ‘meat factor.’
- Advice to reduce red meat consumption could put some Canadians at risk of iron, zinc, vitamin B₁₂ deficiencies and inadequate protein intake leading to sarcopenia, an age-related loss of muscle mass, strength and function.

Health Consequences of Inadequate Intakes of Essential Nutrients Found in Meat^{xvi, xvii}

| Nutrient | Important Sources | Health Consequences of Inadequate Intakes |
|--|---|---|
| Iron | Meat, poultry and fish are the only sources of highly bioavailable heme iron. Plant foods contain only non-heme iron which is less well absorbed by the body. Meat helps the body absorb iron from plant foods. | <ul style="list-style-type: none"> • Low birth weight • Impaired mental function • Impaired learning ability • Impaired energy metabolism • Fatigue • Reduced work capacity • Depression • Lower resistance to infections |
| Zinc | The zinc from foods of animal origin, rich in high quality protein, is more easily absorbed by the body than the zinc from plant foods. Meat helps the body absorb zinc from plant foods. | <ul style="list-style-type: none"> • Low birth weight • Impaired mental function • Impaired learning ability • Delayed development • Growth stunting in children • Lower resistance to infections |
| Vitamins B₁₂ & B₆ | Foods of animal origin are the primary natural source of vitamin B ₁₂ and an important source of vitamin B ₆ . | <ul style="list-style-type: none"> • Impaired energy metabolism • Poor brain growth • Delayed development • Impaired mental function • Impaired learning ability |

ANIMAL AGRICULTURE, FOOD SYSTEMS AND ENVIRONMENTAL IMPACTS

The way our food is produced, processed, distributed, and consumed – including the losses and waste of food – can have environmental implications, such as greenhouse gas emissions (GHG), soil degradation, decreases in water quality and availability, and wildlife loss.

Recent research found a lack of evidence to base diet recommendations on environmental factors citing a disconnect between the science informing strategic climate action in the agriculture sector and the science informing public health nutrition. Based on the available evidence, little can be concluded about dietary strategies to reduce environmental impact.^{viii}

INDIVIDUAL EATING HABITS THAT CAN MAKE A DIFFERENCE TO ENVIRONMENTAL IMPACTS

The dietary change which will have the greatest impact on health and planet is to reduce intake of ultra-processed foods. Here are some mindful habits individuals can make to adjust their eating habits and make a difference to environmental impacts:

Eat recommended serving sizes

- Over-eating is a form of food waste. Data suggests that greenhouse gas emissions are positively correlated with total energy intake – that is, the larger the portion size, the higher the greenhouse gas emissions.
- Super-sizing' can considerably impact the environmental footprint and doesn't do any good for your body either. It's time to re-think the value and amount of resources that go into our food.

Eat real foods and reduce ultra-processed foods

- Consumption of discretionary foods impact the environment negatively from a need for resource input for development and health negatively as well.
- Eat real (core) foods and reduce 'discretionary' or ultra-processed food consumption. Many developed countries dietary patterns have changed to incorporate a higher proportion of discretionary foods as part of the daily diet with a growing proportion of calories coming from these empty-nutrient foods: such as alcohol, chocolate and baked goods, cakes and biscuits, savoury snacks like potato chips and French fries, sugar sweetened beverages, snack bars, ice cream.
- Enrich food skills, such as planning meals and cooking know-how to take advantage of basic core foods that are better for health and the environment

Buy What You Need And Use What You Buy

- Food wastage directly relates to environmental impact because of the amount of energy and resources that are needed to inputs required to manufacture ultra-processed foods. In 2014, the value of food waste and loss in Canada was estimated at \$31 billion. Reducing food waste is an immediate way to ensure we aren't wasting resources.
- When grocery shopping, buy what you can use so you don't have food spoil. Some handy tips are to plan your meals, and use a shopping list when going to the grocery store.
- When eating out order what you can eat, split meals or take home what you can't eat in order to eat it later.

EAT FOR HEALTH CHECK LIST

Assess yourself. The best way to minimize your risk of chronic disease is to live a healthy lifestyle as no one food is a cause or cure

- Do not smoke, maintain a healthy weight, and enjoy regular physical activity.
- Serve your meals with plenty of vegetables and whole grains.
- Drink alcohol responsibly.
- Do I have the food skills to prepare healthy meals or do I need to bone up?

Look in your cart. Are most of the items whole foods or minimally processed foods versus ultra-processed?

- Is there a variety of vegetables and fruit, whole grains and fresh, high quality proteins?
- A healthy balanced diet does not include highly processed and highly refined foods, confectionaries, sugary drinks, and snack foods.
- Am I buying what I need?
- Will I use what I'm buying?

Track your food intake. Are you under, over or within Canada's Food Guide recommendations?

- Keep a food diary for a few days to track what you eat.
- Children, teen girls and women of childbearing age, may benefit from an additional serving of meat.
- Other people, particularly men, may benefit from keeping their meat portions to 225 grams a day, and replacing some of their meat calories with additional vegetables, fruit and whole grains.
- Have I wasted the food I bought?

GLOSSARY OF TERMS

Canadian Community Health Survey (Nutrition) – a national survey conducted in 2004 and 2015 by Statistics Canada for Health Canada which included a 24-hour diet recall.

Disappearance data - the net supply is divided by the Canadian population at July 1 to obtain per capita values or disappearance per person.

Essential amino acids - the nine protein building blocks which must come from the diet or supplements since the body cannot manufacture. Also referred to as indispensable amino acids.

High Quality (Complete) Protein - protein sourced foods that contain all 9 indispensable amino acids in proportions that closely match human needs. Animal proteins are complete proteins. Plant proteins have a limited amount of one or more of the essential (indispensable) amino acids.

Nutrient Content Claim Terms - claims are based on the percentage of Daily Value content of a food. The percent Daily Value is the amount of a nutrient a food contains compared to the amount the average adult requires for optimal health. Claims that can be made are defined and regulated by Health Canada and CFIA:

| % DV | OPTION A | OPTION B | OPTION C |
|-------------|---------------------|--------------|----------|
| 4 to 14% | source of | contains | |
| 15 to 24% | good source of | high in | |
| 25% or more | excellent source of | very high in | rich in |

Plant Based Diet – a dietary pattern that includes more plant than animal foods. Can range from 100% plant foods (fruits, vegetables, whole grains, and legumes) to a combination of plant and animal foods. No plant based or plant/animal combination based diets are inherently healthy. Both need to follow a balanced pattern of eating.

ⁱMeat Proteins Study, Gandalf Group, 2016

ⁱⁱThe growing Canadian energy gap: more the can than the couch? Public Health Nutrition: 12(11), 2216–2224 <https://www.ncbi.nlm.nih.gov/pubmed/19531279>

ⁱⁱⁱCanadian Health Measures Survey: Household and physical measures data, 2012 to 2013. <http://www.statcan.gc.ca/daily-quotidien/141029/dq141029c-eng.htm>

^{iv}Protein 'requirements' beyond the RDA: implications for optimizing health. Appl Physiol Nutr Metab. 2016 <https://www.ncbi.nlm.nih.gov/pubmed/26960445>

^vEvidence Review for Dietary Guidance, Technical Report, 2015, Health Canada

^{vi}Westerterp-Plantenga MS, Lejeune MP. Protein intake and body-weight regulation. Appetite 2005;45:187–90.

^{vii}Westerterp-Plantenga MS, Lejeune MP, Nijs I, van Ooijen M, Kovacs EM. High protein intake sustains weight maintenance after body weight loss in humans. Int J Obes Relat Metab Disord 2004;28:57–64.

^{viii}Layman DK. Protein quantity and quality at levels above the RDA improves adult weight loss. J Am Coll Nutr 2004;23:631S–6S.

^{ix}Layman DK, Evans E, Baum JI, Seyler J, Erickson DJ, Boileau RA. Dietary protein and exercise have additive effects on body composition during weight loss in adult women. J Nutr 2005;135:1903–10.

^xCanadian Health Measures Survey: Household and physical measures data, 2012 to 2013. <http://www.statcan.gc.ca/daily-quotidien/141029/dq141029c-eng.htm>

^{xi}Beef in an Optimal Lean Diet study: Effects on lipids, lipoproteins, and apolipoproteins American Journal of Clinical Nutrition, 95 (1) (2012) <https://www.ncbi.nlm.nih.gov/pubmed/22170364>

^{xii}Fresh and Processed Meat Intake: A Canadian Perspective, https://www.cmc-cvc.com/sites/default/files/Fresh%20and%20Processed%20Meat%20Intake_ENG_CMC.pdf

^{xiii}Statistics Canada. Food available in Canada <http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=20011>

^{xiv}World Nutrition Volume 7, Number 1-3, January-March 2016 (<http://archive.wphna.org/wp-content/uploads/2016/01/WN-2016-7-1-3-28-38-Monteiro-Cannon-Levy-et-al-NOVA.pdf>)

^{xv}Moubarac JC. Ultra-processed foods in Canada: consumption, impact on diet quality and policy implications. Montréal: TRANSNUT, University of Montreal; December 2017. <http://www.heartandstroke.ca/-/media/pdf-files/canada/media-centre/hs-report-upp-moubarac-dec-5-2017.ashx?la=en&hash=9FB9794C42D6B6BA93AB91335E2B6A612656C586>

^{xvi}Institute of Medicine. 2001. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc <https://www.nap.edu/read/10026/chapter/1>

^{xvii}Institute of Medicine. 2001. Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline <https://www.nap.edu/read/6015/chapter/1>

^{xviii}Dietary Strategies to Reduce Environmental Impact: A Critical Review of the Evidence Base, American Society for Nutrition. Adv Nutr 2017 <http://advances.nutrition.org/content/8/6/933.abstract?sid=a7eda8ee-cb1d-4fe2-925a-f6caa8cd78f9>

^{xix}Source:https://blogs.csiro.au/ecos/low-environmental-impact-diet/?utm_source=ECOS-2017-11&utm_medium=newsletter&utm_campaign=ECOS

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