



GUIDE TO
SUSTAINABLE
MENUS



A guide to sustainable menus

A step by step approach
to sustainability



NOURISH
The future of food
in health care.

November 2019



Chapter 4

Choosing your sustainable protein

In healthcare, protein is the heart of a meal—the main component around which all other ingredients revolve. This is the most repetitive component of a meal, and also the most expensive, particularly because it is often meat-based. However, this guide will help you identify other sources of protein that are nutritious, creative, economical and sustainable, and can be used to create meals that are well-balanced rather than being focused solely on protein.

When planning proteins for your menu, the first step is to create meal standards according to the needs of the population you are nourishing. Next, you must look at the type of protein, the frequency with which protein is served, and the frequency of the protein format (cubed, minced, etc.) each week. From an environmental and social perspective, it is also important to take into consideration the cycles of nature and to adapt menus according to the seasons where possible.

This chapter will guide you through these steps.



Sustainable proteins

Why eat protein?

Every cell in your body requires protein—it is essential to building bones, muscle, tissue, skin and more. However, protein reserves in the body are minimal in comparison to other energy reserves such as fat and sugar, so protein must be consumed regularly. A healthy person needs about 0.8 g of protein per kg of their body weight daily. (For ill or elderly people, a high protein intake is frequently recommended; in these cases, the quantities and types of protein in the diet need to be adjusted.) People generally consume far more protein than their bodies actually need, particularly in developed countries such as the United States, Canada, and countries of the European Union, where animal-protein consumption exceeds average estimated daily requirements for protein from all sources¹⁶.

41

Why are sustainable proteins important?

Added to the fact that we eat too much protein, our protein consumption is not sustainable because of our preference for animal sources. Livestock alone contributes 14.5 % of the world's greenhouse gas emissions, primarily due to fertilizer use, land clearing for pasture, and livestock waste management¹⁷. Beef is a popular meat, but is the most inefficient source of animal protein, using more land, freshwater, and generating more greenhouse gases than any other commonly consumed food¹⁸. From an emissions perspective, poultry is the most sustainable form of meat, followed by pork¹⁹. However, other animal proteins such as dairy and eggs are much more sustainable than meat from an emissions perspective. Sustainable proteins such as pulses, are also used to maintain soil health in crop rotation programs.

16 Ranganathan et al., 2016.

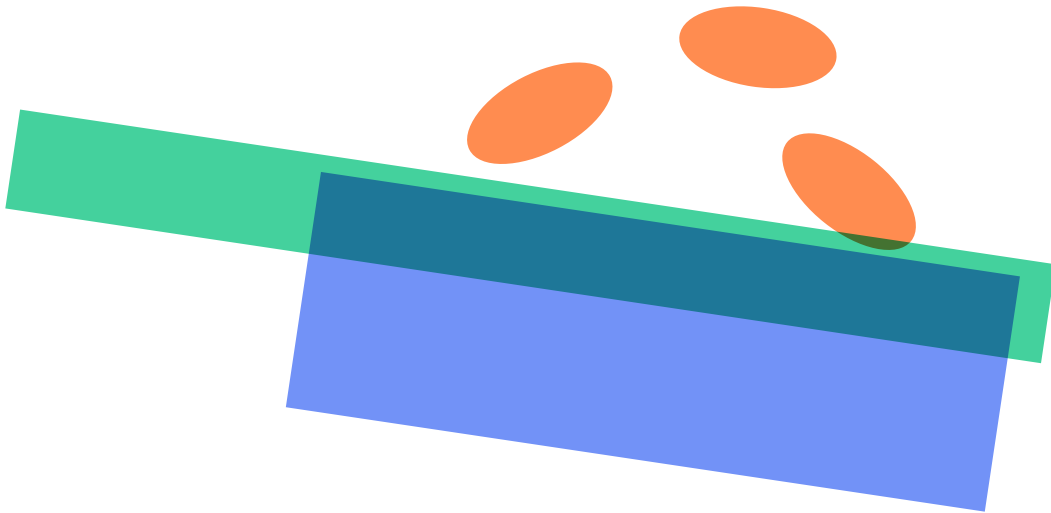
17 Gerber et al., 2013.

18 Shepon et al., 2016.

19 Clune et al., 2015.

These crops grow with dense cover, reducing soil erosion and absorbing excess nutrients that may otherwise runoff into the water. There are various websites that can help us compare the impact our food choices have on the planet, for example: [Climate Change Food Calculator](#) (note that figures are based on global averages of studies from different countries).

Research is constantly evolving and while general guidelines on protein intake are unlikely to change substantially, small adjustments could be made.



What is the impact of sustainable protein on health?

Although it is difficult to study the impact of food on long-term health, emerging evidence suggests that, for optimal health, we should move away from meats towards plant proteins. Studies show that ultra-processed proteins (such as “nuggets” made from poultry, fish, and meat) are inefficient sources of protein. The worldwide increase in consumption of these products is linked to a dilution of dietary protein content along with excessive overall caloric intake²⁰. The Guiding Principles and Recommendations in the 2019 edition of Canada’s Food Guide encourage us to consume less red meat in favour of plant-based foods to promote health and reduce the incidence of chronic disease. Plant-based diets

are also associated with a lower risk of cardiovascular disease²¹. Moving towards a plant-based diet does not compromise the nutritional quality of one's diet. Consumption estimates indicate that there is ample room in high-consuming populations in countries such as Canada, to maintain adequate protein intake while decreasing animal protein consumption²². (Again, exceptions must be made for populations that need protein-rich diets.)

How can I prioritize incorporating sustainable proteins?

- The amount of protein served should be adapted to the client or patient's needs or treatment plan (diet with low or high protein content) and not exceed needs. In some cases, supplements or fortified foods can provide the necessary amounts of nutrients: see chapter 11 for sustainable choices and tips.
- A large variety of proteins should be provided, and the majority of proteins should be chosen according to sustainability criteria.
- When reducing the frequency of meals containing meat and other livestock products (egg, milk, cheese, etc.), it is important to undertake tasting panels with clients and patients, with a goal of ensuring that recipes are as good or better than the previous ones!
- Education by food services and professional dietitians must accompany menu shifts—for example, information demonstrating that vegetarian diets can meet current recommendations for protein, omega-3 fatty acids, iron, zinc, iodine, calcium, vitamin D, and B12.
- Recipe origins should reflect the cultures present in the area of the healthcare facility, including traditional Indigenous foods.

21 Satija & Hu, 2018.

22 Ranganathan et al., 2016.

2

What are my protein standards?

Before choices are made regarding the type of protein for a menu, protein standards must be written. Protein standards are guidelines that you must work with such as dietary restrictions, allergies, and patient preferences.

Below is an example of meal standards written by a food service manager for their institution. The last two columns indicate the clientele to which they apply (examples might be the elderly, youth, acute care patients, etc.).

Standards	Clientele a	Clientele b
Two choices of protein for lunch and dinner (total 4/day)	X	X
One choice of meat for each meal, with a different variety for each consecutive meal	X	
Consumption of red meat should not exceed 70g/day	X	X
One choice of fish, twice a week	X	X
One choice of vegetarian protein per meal		X
Use plant-based protein regularly; egg and cheese maximum twice a week as protein for vegetarian dishes	X	X
Two choices of sandwich per meal	X	
One choice of salad every meal with one portion of protein and 5 different vegetables	X	X
Dishes should not be repeated in the same week	X	X
One type of traditional Indigenous source of protein / wild meat for an event each month (e.g. National Indigenous Peoples Day on June 21st)	X	

3

Making sustainable protein choices

Below are charts listing different proteins you could include in your menus.

- The chart below explains how to use the two following charts (a and b).
- Chart a) is a simple table that can be printed to work with.
- Chart b) gives the information necessary to make sustainable choices.

LEGEND FOR CHARTS A) AND B).






Choice of protein (ranking criteria to assess sustainability)

Tips for choosing

Ranking/Order

A ranking of food items, in general order of decreasing sustainability (see the appendix for methodology used).

Nutrition quality: Symbols

-  Indicates that the food contains fibre
-  Indicates that it contains monounsaturated and polyunsaturated fats
-  Indicates no added sodium
-  Indicates an unprocessed or minimally processed product
-  Indicates a complete source of protein (contains all amino acids)

With reference to environmental, social, and economic sustainability, these are tips for choosing your ingredients. If a choice meets one criterion, you have taken a small step towards sustainability. The more criteria met, the more sustainable the choice.

The **labels** are good indicators of sustainable practice. A complete list can be found on the [Office of Consumer Affairs Canada website](#).

In some provinces, other logos are used to identify organic or local food. Look for your province's logo! However, be mindful that there exist producers who have sustainable practices but do not have certification—perhaps due to cost or other limitations.



What do I need to change?







Use the table below to quantify your meals according to the type of protein served in your menu. Moving from left to right will allow you to determine how to improve your meal options in terms of sustainability and potential cost savings. The “total number of choices per week” column can track how many meals include the mentioned protein or combination of animal and plant protein. The cost column can be used to determine the cost per portion, the cost of the meal including protein, or any other metric that is useful for you to keep track of your spending following the menu changes.

According to the EAT-Lancet commission, North Americans should reduce the amount of beef, lamb and pork they eat each week to around 100 g, and reduce consumption of chicken and other poultry to around 200 g, egg consumption by to around 90 g, and dairy products to around 1.75 litres of milk / 210 g of cheese, and they should increase their weekly consumption of fish to around 200 g, legumes to around 525 g, and nuts to around 350 g.²³












Protein types and formats will vary with cultural needs. For example, a hospital in an area where the population is predominantly East Asian may prefer to primarily serve beef, chicken strips and cubed tofu but not pasta, cheese or legumes.

²³ The recommended figures represent a reduction in average per-person consumption of approximately 638% for beef, lamb and pork, 235% for poultry, 268% for eggs, and 145% for dairy products!

A) BREAKFAST

Choice of protein (listed from most to least sustainable)	Total number of choices per week (quantity)	Current Cost	To make menus more sustainable, generally	Total number of choices per week (quantity)	New Cost
	Current menu:			Current menu:	
 Legumes			Increase		
 Nuts and seeds			Increase		
 Plant-based meat substitutes			Increase		
 Eggs			Reduce or leave unchanged		
 Dairy			Reduce or leave unchanged		
 Pork			Reduce		
TOTAL					

A) LUNCH AND DINNER

Choice of protein <small>(listed from most to least sustainable)</small>	Total number of choices per week <small>(quantity)</small>	Current Cost	To make menus more sustainable, generally	Total number of choices per week <small>(quantity)</small>	New Cost
	Current menu:			New menu:	
 Legumes			Increase		
 Nuts and seeds			Increase		
 Plant-based meat substitutes			Increase		
 Wild game meats	With plant proteins:		Increase (Indigenous populations as appropriate)	With plant proteins:	
 Eggs	With plant proteins:		Reduce or leave unchanged	With plant proteins:	
 Insects	With plant proteins:		Increase	With plant proteins:	
 Poultry	With plant proteins:		Reduce or leave unchanged	With plant proteins:	
 Dairy	With plant proteins:		Reduce or leave unchanged	With plant proteins:	
 Seafood	With plant proteins:		Increase sustainable choices, reduce or remove others	With plant proteins:	
 Pork	With plant proteins:		Reduce	With plant proteins:	
 Red meats	With plant proteins:		Reduce	With plant proteins:	

TOTAL

How can I change?

B) CHANGES POSSIBLE

Use this chart to choose a variety of protein and increase sustainable choices.

CHOICE OF PROTEIN
(listed from most to least sustainable)

1. Legume/pulses

BEANS - BUTTER, BLACK, PINTO, MUNG, SOY (EDAMAME), KIDNEY, LIMA, NAVY, FAVA, RED (ADZUKI) - **PEAS** - COWPEA, SPLIT PEAS - **LENTILS** - GREEN, RED, YELLOW

TIPS FOR CHOOSING

- **Avoid high sodium and processed options.**
 - Some canned legumes may have high amounts of salts and additives to prolong shelf life.
 - Refer to the nutritional guidelines for information on sodium content.
- **Choose regional suppliers from nearby provinces and states.**
 - For example, if you are based in Quebec, it is often better to source from Vermont or Maine than Alberta.
- **Choose bulk.**
 - Dry legumes can be stored for up to a year!
 - Bulk packaging in cardboard boxes has less of an environmental impact than tin cans.
- **Choose organic.**
 - Organic crops are grown without the use of synthetic pesticides.

TIPS FOR INCLUSION IN YOUR RECIPES

Legumes and pulses may not be complete proteins but can round out a day of varied protein consumption. Lentils are a "flavour sponge," meaning they absorb flavours well. Certain spices and herbs can make legumes more easily digestible, including ajwain²⁴ and epazote²⁵.

Many cultures use legumes: increase your variety of recipes!

- **Prepare**
 - Use aromatics (carrots, onions, garlic) in the soaking water.
- **Cook**
 - Use aromatics or low-sodium vegetable stock in the cooking water.
 - Lightly fry or bake as a snack, topping, or salad bar ingredient, or use as a meal replacement.
 - Include in meals to reduce meat: this will help clients better adjust to the taste and digestion.
 - Mix into meat or fish burgers, meatballs or meat loaves.
 - Use beans in breakfast dishes.
- **Blend**
 - Add to muffins or other baked goods.
 - Thicken soups and sauces.
 - Hummus can be served with bread, crackers, or vegetables.
- **Replace**
 - Whip chickpea brine rather than egg whites.
 - Blend pulses rather than use mayonnaise.
 - Add more beans to your breakfast menu.

2. Tree nuts

CASHEWS - ALMONDS - WALNUTS - PECANS - PISTACHIOS
BRAZIL NUTS - NUT BUTTERS

- **Choose low sodium options.**
 - Be wary of nuts that are already salted.
 - Refer to nutritional guidelines for information on sodium content.
- **Choose more local nuts.**
 - Almonds, walnuts, pecans, pistachios, and hazelnuts can all be grown in North America.
- **Choose fair trade exotic nuts.**
 - Brazil nuts and cashews are typically imported into Canada.
- **Choose organic.**
 - Organic crops are grown without the use of synthetic pesticides

Nuts are a good way to add new textures to meals.

- **Prepare**
 - Slightly toast nuts on a stovetop and provide as a salad topping.
 - Offer nuts at your salad bar.
- **Cook**
 - To reduce meat but maintain nutritional quality, mix a blend of nuts with meat in standard meat recipes such as chili or stew.
- **Blend**
 - Use nut butters as the sauce base for Asian noodles or salads.
- **Replace**
 - Offer nut butter sandwiches if appropriate for the patient.
 - Offer more varieties of nut butters for breakfast.

²⁴ Zarshenas et al., 2013.

²⁵ Nolte, n.d.

CHOICE OF PROTEIN
(listed from most to least sustainable)

3. Seeds



CHIA - HEMP - SUNFLOWER - SESAME - FLAX

TIPS FOR CHOOSING

- Choose regional suppliers from nearby provinces and states.
- Choose organic.
 - Organic crops are grown without the use of synthetic pesticides.

TIPS FOR INCLUSION IN YOUR RECIPES

- **Prepare**
 - Toast sunflower or sesame seeds for additional flavour.
- **Cook**
 - Sprinkle seeds on top of cooked dishes to augment protein content, such as on breakfast porridge, on salads, or in smoothies.
- **Blend**
 - Purchase whole seeds and grind to add to burgers and meatballs. If ground seeds are purchased, store in the freezer for proper preservation.
- **Replace**
 - Use chia or grounded flax to thicken pudding or replace eggs in desserts.
 - Offer a variety of seeds as a garnish in your salad bar.

4. Meat substitutes (plant-based)



TOFU - SEITAN - TEMPEH - TEXTURED SOY PROTEIN - POWDERS AND PROCESSED ITEMS: SOY PROTEIN ISOLATE* - ISOLATED PEA PROTEIN - WHEY PROTEIN - MYCOPROTEIN (NOTE POTENTIAL FOR ALLERGEN SENSITIVITY²⁶) - **PLANT HEME/ LEGHEMOGLOBIN**

- Avoid long ingredient lists.

· Although tofu, tempeh, and seitan are traditional foods in many cultures, meat substitutes can also have long ingredient lists with salt, sugar, fillers, and additives²⁷. However, many minimally processed options are available.

Refer to the nutritional guidelines for information on sodium content.

- Choose regional suppliers from nearby provinces and states.
- Choose organic.
 - Organic crops are grown without the use of synthetic pesticides.
- ***Be aware**
 - According to the AFSSA, the overconsumption of soy protein isolate (isoflavone) may have a negative estrogenic interaction, particularly for pregnant women and children under 3, who should avoid products containing this substance.

Meat substitutes allow for lots of creativity: tofu comes in a variety of textures, seitan is tender and meaty, and tempeh is slightly nutty.

- **Prepare**
 - To increase the flavour of firm tofu, freeze, thaw, drain, and marinate for 24h. You may also freeze the tofu in marinade.
- **Cook**
 - Cut or mince small cubes of tofu or tempeh to blend well with existing recipes.
 - Create patties with seasoned firm tofu, seitan, or tempeh.
 - Scramble tofu for breakfast instead of eggs.
- **Blend**
 - Add silken tofu to smoothies, desserts, sauces.
 - Replace egg with silken tofu.
 - Thicken soups, sauces, with silken tofu.
- **Replace**
 - Offer grilled tempeh in sandwiches rather than slices of deli meats or in burgers or offer meat substitutes imitating deli meat.
 - Replace meats in stir-fries with seitan or extra-firm tofu.

²⁶ Jacobson MF, et al. (2018).

²⁷ Healthcare Without Harm, 2017.

CHOICE OF PROTEIN
(listed from most to least
sustainable)

5. Wild game meats and seaweeds

SEAWEED - SMALL MAMMALS (RABBIT, SQUIRREL, BEAVER) - DEER - MOOSE

TIPS FOR CHOOSING

- **Across Canada it is illegal to serve wild game meats unless with special permission or under special circumstances.**
 - However, they are a sustainable option provided that they are hunted during the appropriate season of the year from populations that are well-managed.
- See the section on traditional Indigenous sources in Chapter 4.

TIPS FOR INCLUSION IN YOUR RECIPES

Most wild game meats are higher in nutrients (such as B vitamins, iron, omega 3s), and have a better balance of omega 3 and omega 6 than the meat of domestic animals²⁸.

- **Prepare**
 - Ensure that the inedible parts of game (feathers, hair, etc.) are properly separated from the edible parts (meat).
 - Try placing the game meat in a brine to add moisture and prevent the meat from drying out.
- **Cook**
 - Game meats are quite lean: add marinades to bring out more flavour.
- **Blend**
 - Combine game meats with traditional domestic meats in recipes.
- **Replace**
 - Instead of traditional domestic meats, follow the wildlife hunting calendar to theme your meals; for example, offer moose when it is moose hunting season.

6. Eggs

FRESH EGGS - PROCESSED EGGS: COOKED AND PEELED - LIQUID - POWDER - READY-MADE OMELETTES OR OTHER EGG PRODUCTS

- **All Canadian eggs are antibiotic and growth hormone-free. Animals which are treated with antibiotics are not used for human consumption.**
- **Choose free-run or free-range eggs.**
 - Free-run hens have freedom to roam within an enclosed barn, while free-range hens have access to the outdoors, in contrast to conventional hens which remain in battery cages²⁸.
- **Choose fresh over processed eggs.**
 - However, liquid eggs and pre-cooked eggs without additives are also good options.
- **Choose organic eggs.**
 - Canadian organic poultry is fed with no animal by-products.

Eggs are also a good source of micronutrients, particularly in B Vitamins.

- **Prepare**
 - Eggs are versatile: plan for different styles of preparation throughout the week such as over-easy, poached, or scrambled.
- **Cook**
 - Make frittatas or omelettes using any combination of vegetables you may have handy.
 - Offer boiled eggs in your salad bar or as a meal replacement.
- **Blend**
 - Make mayonnaise, aioli, and other sauces using eggs.
- **Replace**
 - Instead of deli meats, offer scrambled eggs in sandwiches, burritos, and pitas.

²⁸ Chicken Farmers of Canada, 2018.

²⁹ Medeiros et al, 2002

CHOICE OF PROTEIN
(listed from most to least sustainable)

7. Insects



CRICKET POWDERS - CRICKET FLOURS - ROASTED INSECTS - PROCESSED INSECT-BASED PRODUCTS • ENERGY BARS • CHIPS • PASTA SAUCE

TIPS FOR CHOOSING

Insects are a good sustainable choice: they can feed on organic waste, which is a high source of nutrients that is usually disposed of or composted. Although not widely accepted (yet!), insects are a good source of iron, fibre, omega-3, calcium, and B12.

- Choose regional suppliers from nearby provinces and states.
- Choose organic.

TIPS FOR INCLUSION IN YOUR RECIPES

The following tips can help you integrate them into your recipes. You can augment any existing recipe with insect powder without changing taste: pastas, stews, desserts. Make sure you discuss the addition of insects or insect flours with your clients before including them in a recipe, unless the name of the recipe makes the matter clear.

- **Prepare**
 - Recipes that are low in protein can easily be augmented with cricket powder.
- **Cook**
 - Add powders to savoury dishes such as soups, stews, or curries.
- **Blend**
 - Add powder to smoothies, sauces, or dips to add extra protein.
- **Replace**
 - When baking desserts, replace 10% to 15% by weight of flour with cricket powder.

8. Poultry and rabbit



DUCK - CHICKEN - RABBIT - TURKEY

- **All Canadian poultry is growth-hormone free. Animals which are treated with antibiotics are not used for human consumption.**
- **Choose regional suppliers from nearby provinces and states.**
- **Choose a variety of parts.**
 - Reduce waste at production site by eating all parts of the poultry, including giblets.
- **Choose free-range poultry.**
 - All Canadian poultry raised for meat is free-run, meaning they have space to move freely but do not necessarily have access to the outdoors (free-range).
- **Choose organic poultry.**
 - Organic poultry comes from chickens which are fed with feed free of animal by-products and synthetic pesticides, herbicides, and fungicides: this drastically lowers poultry's global warming impact³⁰. Organic poultry also have daily access to the outdoors³¹.

PROCESSED POULTRY - CHICKEN SAUSAGE - CHICKEN STRIPS - CHICKEN DELI MEAT - TURKEY DELI MEAT

- **Avoid breaded, pre-fried meat.**
 - The processing results in a loss of nutritional value and increase in sodium and fats.

See the appendix for information on processed foods.

Poultry is the most sustainable form of meat.

- **Prepare**
 - Follow the wildlife hunting calendar to theme your meals; for example, offer duck when it is duck hunting season.
- **Cook**
 - Use minced meat in spaghetti sauce.
 - Create homemade burgers, nuggets, meatballs, meatloaves, with legumes and/or oats to reduce meat consumption.
- **Blend**
 - Use the giblets—the organs inside poultry—to add flavour to your dishes.
 - Puree and add to meatballs, meatloaves, or other mixed meat dishes.
 - Boil and make chicken stock.
 - Use minced meat containing offal.
- **Replace**
 - Choose poultry deli meats and sausages rather than pork or beef.

30 Boggia et al., 2010.

31 British Columbia Society for the Prevention of Cruelty to Animals, 2015.

CHOICE OF PROTEIN
(listed from most
to least sustainable)

9. Dairy



MILK/CREAM - POWDERED MILK, CREAM - YOGURT - KEFIR - CHEESE

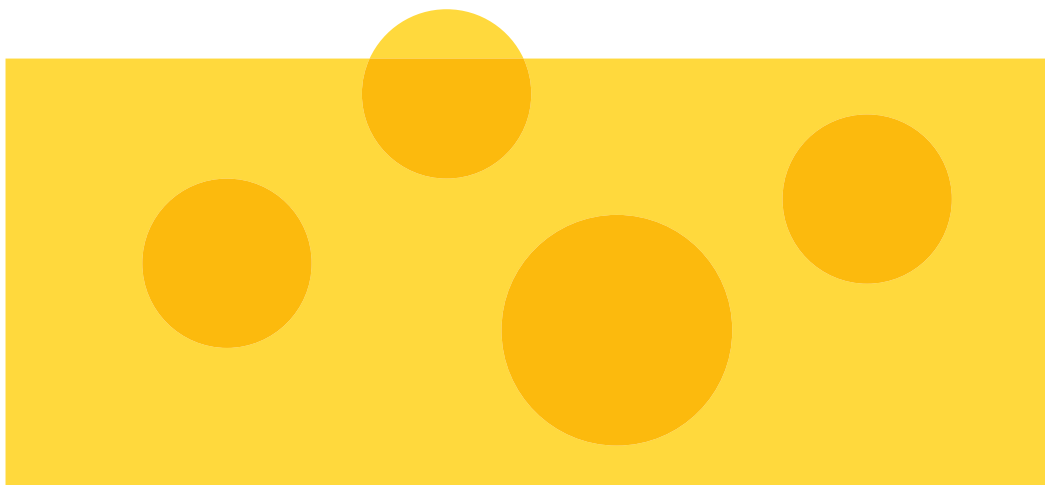
TIPS FOR CHOOSING

- **Animals treated with antibiotics are not used for human consumption.**
- **Avoid high sugar, sodium, and low fat products.**
 - Products can be processed to modify the sugar, sodium, and fat content. Low fat products should only be offered if prescribed by the diet of a specific patient. Avoid flavoured milk, which is high in sugar.
 - Refer to nutritional guidelines for information on sodium content.
 - Avoid dairy products from animals treated with antibiotics and growth hormones by asking your suppliers for the provenance of ingredients. **All Canadian dairy products are antibiotic and synthetic growth-hormone free.** However, transformed dairy products (cheese, yogurt, etc.) may contain milk concentrate from the USA.
- **Choose dairy from grass-fed and pasture-raised animals.**
 - Look for certification or language such as “100% grass-fed and finished”.
- **Choose organic dairy.**
 - Organic dairy comes from cows which are fed with feed free of synthetic pesticides, herbicides, and fungicides. Organic dairy cows also have more access to pasture³².

TIPS FOR INCLUSION IN YOUR RECIPES

Fermented dairy products which contain probiotics (cheese, yogurt, and kefir) are good for digestive health.

- **Prepare**
 - Feature the digestive benefits of dairy products such as kefir, yogurt, and cheese.
- **Cook**
 - Consider adding cheese in vegetarian meals to assist the transition away from meat proteins; it can also increase the protein content if needed.
- **Blend**
 - Use yogurt or kefir to thicken sauces, smoothies, and milkshakes.
 - Add milk powder and cream to sauces or liquid meal/desserts to increase protein and energy (homemade supplement).
- **Replace**
 - When baking:
 - Substitute kefir for buttermilk.
 - Use kefir to leaven or ferment dough recipes.



CHOICE OF PROTEIN
(listed from most
to least sustainable)

10. Seafood



Note: the food items below are not ranked in order of sustainability. [See here for purchasing sustainable](#).

SEAFOOD. - SEAWEED - FISH (HERRING, POLLOCK, CARP, MACKEREL, SEA BASS, HADDOCK, SALMON, TROUT) - MUSSELS - SQUID - NORDIC SHRIMP - LOBSTER - CRAB, SCALLOP, OYSTER, CLAMS, OCTOPUS - SHRIMP

TIPS FOR CHOOSING

- **Choose a wide variety of regional seafood**
 - This places less pressure on any one population.
 - Choose aquaculture and fisheries supported by local communities (ownership, co-ownership, or partnership) and when possible, Indigenous communities.
- **Choose shellfish from aquaculture, Avoid farmed salmon³³.**
 - Farmed shellfish such as mussels, clams, and oysters have minimal ecological impact and animal welfare concerns³⁴.
- **Choose Canadian shrimp, avoid imported shrimp.**
 - Canadian shrimp is sustainably harvested in comparison to many types of imported shrimp, which is harvested in a manner that destroys local forests and animal habitats³⁵.
- **Choose sustainable canned tuna.**
 - Reference this Greenpeace report of the most sustainable canned tuna brands.
- **Choose less common seafood.**
 - Seafood at the bottom of the food chain, such as small fish (mackerel, sardines, anchovies), contain less pollutants and are often more sustainably harvested.
- **When choosing seafood, inform yourself by reading about seafood eco-certifications.**
 - and look for the following eco-certifications and rankings [Ocean Wise](#), [Seafood Watch](#) Green ranking and research fish species and catch methods on the websites of these organizations.
- **In addition, when choosing seafood from fisheries:**
 - look for [Marine Stewardship Council](#) label
- **When choosing seafood from aquaculture (farmed):**
 - look for the [Global Aquaculture Alliance](#) Best Aquaculture Practice logo (4 stars)
 - look for the [Aquaculture Stewardship Council](#) label

PROCESSED SEAFOOD - SMOKED SALMON - FISH STICKS - IMITATION CRAB MEAT - TUNA SALAD

- **Avoid consumption of processed seafood.**
 - Processed seafood often contains less omega-3 fatty acids than raw seafood. Some contain less protein per portion than unprocessed seafood³⁶.
- **Avoid high-sodium options.**
 - Reference the nutritional guidelines for information on sodium content.
- **Choose natural processing.**
 - For example: smoked salmon (heat vs cold smoke, salt vs nitrate processing)

TIPS FOR INCLUSION
IN YOUR RECIPES

Seafood is often a good source of omega-3 fatty acids which can be difficult to find in other foods.

- **Prepare**
 - Frozen seafood is sometimes the most sustainable choice, because it can be shipped by rail rather than by air. Pre-cut or minced frozen fish is often a cheaper choice.
- **Cook**
 - Many cultures use seafood—increase your variety of recipes!
- **Blend**
 - Use a variety of seafood to prevent high costs and introduce variety into your meals.
- **Replace**
 - Offer fish patties instead of meat patties in burgers.
 - Make seafood stews, soups, or chili rather than using meat.

³³ <https://www.seachoice.org/info-centre/aquaculture/disease-parasites-and-chemicals/>

³⁴ Jacquet, 2017.

³⁵ Amos, 2014

³⁶ Dietitians of Canada, 2013.

CHOICE OF PROTEIN
(listed from most to least
sustainable)

11. Pork



12. Red meats



RAW PORK

VEAL - LAMB - BEEF

TIPS FOR CHOOSING

- **Choose regional suppliers from nearby provinces and states. Canadian pork is growth-hormone free.**
- **Choose a variety of parts.**
 - Reduce waste at production site by eating all offal and swine parts.
- **Choose pork raised without antibiotics.**
 - The over-use or misuse of antibiotics in animal agriculture is a major driver of antimicrobial resistance³⁷.
- **Choose pasture-raised pork.**
 - Pasture-raising ensures space for animals to move freely. However, currently, there are a few options for purchasing this type of pork, because few producers are using these methods.
- **Choose organic pork.**

- **Purchase smaller portions of red meat.**
 - Canada's Food Guide recommends consumption of less red meat, particularly processed meats.
- **Choose regional suppliers from nearby provinces and states.**
- **Choose a variety of parts.**
 - Reduce waste by eating all parts and offal such as tongue, heart, and liver.
- **Choose antibiotic- and hormone-free red meats.**
 - The use of preventative antibiotics in livestock contributes to antimicrobial resistance³⁸.
- **Choose pasture-raised, grass-fed red meats.**
 - These animals have enough space to move freely. Grass-fed cattle do not depend on grain production for feed.
- **Choose organic meats.**

PROCESSED PORK - HAM - BACON - SAUSAGE - CURED PORK (PROSCIUTTO, SALAMI)

- **Avoid processed pork.**
 - The consumption of nitrates and nitrites found in processed pork may be carcinogenic to humans³⁹. Refer to the nutritional guidelines for information on sodium content.
- Refer to EWG's Food Scores for more information on processed foods.

PROCESSED RED MEATS - HOT DOGS - SAUSAGES - DELI MEATS

- **Avoid consumption of processed red meats.**
 - See the appendix for information on nitrates and nitrites.
- Refer to EWG's Food Scores for more information on processed foods.

TIPS FOR INCLUSION IN YOUR RECIPES

Small amounts of pork can result in lots of flavour.

- **Prepare**
 - Offal must be eaten within 24 hours of purchase; can be frozen and consumed within 3-4 months but will change in flavour, appearance, and taste.
 - **Cook**
 - Chop pieces of pork and mix with legumes or vegetables.
 - Hearts and tongue
 - Slow cook in liquid.
 - Braise or poach.
 - Liver, kidney, brains
 - Grill or fry.
 - Eat less than once a week. These types of offal are particularly high in Vitamin A, and excessive consumption can be linked to negative effects, particularly for pregnant women⁴⁰.
 - **Blend**
 - Puree offal and add to meatballs, meatloaves, or other mixed meat dishes.
 - **Replace**
 - Offer tempeh or turkey bacon in place of pork bacon at meals.
 - Look for soy sausages or ground soy substitutes to replace hot dog sausages, for example.
- See the appendix for offal use.

Unhealthy consumption of red meats is linked to various types of cancer, chronic disease, and shortened lifespans⁴¹.

- **Prepare**
 - Feature "Meatless Mondays" serving only vegetarian or vegan dishes.
 - Minimize portion size of beef and make other elements of the meal the highlight.
- **Cook**
 - Hearts, and tongue
 - Slow cook in liquid.
 - Braise or poach.
 - Liver, kidney, brains
 - Grill or fry.
 - Eat less than once a week. These types of offal are particularly high in Vitamin A, and excessive consumption can be linked to negative effects, particularly for pregnant women⁴².
- **Blend**
 - Instead of 100% meat burgers, blend with mushrooms or legumes.
- **Replace**
 - Offer vegetarian burgers at meals: look for plant-based sausages or ground soy substitutes which replicate the taste and texture of meat, but be cautious—they may contain isolated soy and high sodium.

37 Michael et al., 2015.

38 IPES-Food, 2017.

39 See the appendix.

40 Coyle, 2017.

41 Sun, 2012.

42 Coyle, 2017.

4

Varying protein format

In order to offer a different experience for each meal, it is important to vary the format of the protein offered from one meal to another.

Frequency by format

of choice per week: _____
of choice per format

Pasta sauce with meat or meat substitutes

Legumes or minced protein

Eggs

Meatballs / patties / loaves

Cubed meat or tofu, tempeh, seitan

Strips of meat or tofu, tempeh, seitan

Whole pieces of meat or meat substitutes

Sausage, deli meat or meat substitutes

Protein types and formats will vary with cultural needs. For example, a hospital in an area where the population is predominantly East Asian may prefer to primarily serve beef and chicken strips and cubed tofu but not pasta, cheese or legumes.



Controlling waste (general)

Food waste is a large source of economic, environmental, and nutritional loss. Approximately one third of the food produced in the world is lost or wasted⁴³ —a statistic to which healthcare is a significant contributor. However, this provides us with an opportunity to be part of the solution. There are two types of food waste: waste produced in the kitchen and “plate waste” produced by residents or patients not finishing their meals. Kitchen waste results from failing to maximize the potential use of an ingredient. Food left on the plate can be an indicator of dissatisfaction and be associated with malnutrition. It is important to monitor plate waste carefully, since doing so can help identify recipes and portion sizes that need to be improved.

You can also see [The Amazing Waste Cookbook](#) for recipes on how to incorporate food scraps and repurpose leftover food. Visit [The Amazing Waste Website](#) for videos and more tips and tricks.

Reducing packaging waste	Reducing kitchen waste	Reducing patient /resident waste	Managing overall food waste
<ul style="list-style-type: none"> • Buy items in bulk when possible. <ul style="list-style-type: none"> · Bulk items are cheaper, store well, and minimize use of plastic. • Look for eco-friendly packaging and recycle packaging in accordance with municipal regulations. <ul style="list-style-type: none"> · Look for compostable or biodegradable materials made out of corn, starch, or cellulose. • Commit to reusable containers. • Prioritize serving in reusable bowls, glasses, plates, and utensils, when possible. 	<ul style="list-style-type: none"> • Reduce the amount of steps needed to prepare a meal. <ul style="list-style-type: none"> · The more steps needed, the more waste produced in the process in terms of food ingredients, energy and water. • Revise your production quantities according to real needs. <ul style="list-style-type: none"> · Analyze how much food is left on a plate on a daily basis. This will allow you to plan appropriate amounts of food to prepare. • Repurpose parts normally thrown out. <ul style="list-style-type: none"> · Animal organs can be used to make tasty soup stocks; vegetable stems and peelings can be frozen and used for making stocks. 	<ul style="list-style-type: none"> • Watch out for portion size! <ul style="list-style-type: none"> · Make half portions available. Choose different portion sizes according to the needs of each clientele. Use smaller serving bowls. Encourage and allow for second helpings. • Introduce selective or semi-selective menus. <ul style="list-style-type: none"> · For example, room service. This allows patients to choose a portion or a full serving. Less waste is produced when patients can choose what they want to eat. • Observe what is left on the plate. <ul style="list-style-type: none"> · Items left on the plate may be less popular: make serving adjustments in the future as necessary. 	<ul style="list-style-type: none"> • Refrigerate and freeze leftovers. <ul style="list-style-type: none"> · See the Government of Canada’s guidelines on safe fridge and freezer storage. • Introduce compost infrastructure. <ul style="list-style-type: none"> · See Practice Greenhealth’s guidelines for composting in healthcare facilities. And consult the Compost Council of Canada for more info. • Donate leftover meal portions. <ul style="list-style-type: none"> · Find local organizations that want food donations (homeless centres, women’s shelters, etc.).

43 Food and Agriculture Organization of the United Nations. (n.d.).

6

Controlling protein waste

Save the protein

- **Refrigerate leftover proteins.**
 - These must be reheated and served within three days.
- **Freeze leftover proteins.**
 - Freeze in a large pan to use it for the next menu cycle, or in individual portions to serve as patient specials.
- **Freeze defrosted, cooked meat.**
 - Instead of disposing of thawed meat, freeze after cooking for use in future recipes.

Repurpose the protein

- **Plan your menu in anticipation of leftover proteins, rather than using fresh proteins.**
- **Puree, dice, and add to soups or salad.**
 - This adds plenty of flavour while adding high protein nutritional content.
- **Boil to create a broth.**
 - Protein broth can be used for soups or sauces.
- **Mince to make a meatloaf.**
 - This is also a good opportunity to incorporate legumes. Must be served within three days.

Serve the protein

- **Serve as a menu “special.”**
 - Use leftover proteins from the day before, repurpose into a new meal and serve as a “special” menu item. Can be sold at a lower price.
 - Serve cold in a new salad recipe or as a source of protein at the salad bar.

7

Sustainable meat

Sustainable meats contribute to healthy clients and healthy ecosystems. This includes organic, free range, and grass-fed meats. It is important to note the existence of suppliers who have sustainable practices but are not certified organic or grass-fed; this may be due to the cost or time constraints of certification. As mentioned in the *Sustainable protein* section earlier in this chapter, health and environmental considerations impel us to move to limit consumption of meats with large environmental footprints and move to more plant-based diets in Canada. Meats listed in the charts in that section are generally ordered from more to less sustainable options.

Organic

Canadian organic agriculture is built on the pillars of health, ecology, fairness, and care⁴⁴. Organic feed must not contain a) genetically modified crops b) crops treated with synthetic chemicals c) animal by-products. As a result, organic feed is typically sourced

from a diversity of crops which encourage healthy treatment of soil and ecosystems.

See Dalhousie [University's Resources for organic livestock](#).

Poultry

The biggest factor in poultry farming's potential contribution to climate change is the feed the birds eat: it accounts for 70% of poultry's "global warming potential" (see the explanation under Methodology later in this chapter), trumping the potential of land use, and water use and production. As a result, organic, vegetable-grain fed, and pasture-raised poultry have a significantly lower impact on the environment than conventional poultry.

See Chicken Farmers of Canada's [Wheel of Chicken](#) to understand your poultry options.

- Free-range
This is typically used to describe birds that have access to the outdoors. There is no legal definition for free-range and practices can vary from farm to farm.

Pork

The primary difference between organic and conventional pork is the facility the animals are raised in. Organically raised pigs have access to the outdoors, and different standards for bedding and stocking density apply⁴⁵.

- Pasture
This is typically used to describe meat from pigs that have access to the outdoors and feed on pasture. There is no legal definition of pasture and practices can vary from farm to farm.

Beef

Overall, beef from cattle raised on pasture contains less total fat than conventional beef, and the fat that it does contain is much healthier⁴⁶.

- 100% grass fed
According to Healthcare Without Harm: 100%

45 Simpson, 2012
46 Gunnars, 2018

grass-fed beef can contain 2–4 times more omega-3 fatty acids than its grain-fed counterpart⁴⁷. Grass-fed beef cattle also contribute to carbon sequestration—a form of storing carbon in the soil. This can compensate for carbon released through the animals' life cycle, improve soil health, reduce the need for synthetic fertilizers, and maintain biodiversity and habitat⁴⁸.

8

Learning about traditional Indigenous proteins

“Harvesting food for a healthy lifestyle: Go to the land and waters to find your first foods. Be active in exercising your right to hunt, fish, harvest and gather in your territory. Ask the old people and the traditional and environmental knowledge keepers how to do this in a good way. It will be good for the mind, body and spirit, and contribute to a self-reliant future.”

- First Nations Health Authority, British Columbia

In this section we highlight different protein sources from traditional Indigenous diets. These proteins can be challenging to source as they cannot always be bought, and serving wild meat is often prohibited in healthcare facility kitchens, but reflecting on our way of eating begins with understanding traditional sources of sustainable protein.

The examples that follow may represent foods of a specific geographical location or Indigenous territory. Please be mindful of the Indigenous territory you are on: make connections, build relationships and learn what foods are original to this territory.

47 Healthcare Without Harm, 2017.

48 Teague et al, 2016.

It is also important to note that there may be health risks associated with consuming game meats. See [Health Canada's guidelines](#) for safe preparation of game meats.

Fish and seafood

Seafood is a good source of protein, omega-3 fatty acids, and several vitamins; soft bones are a source of calcium. However, many current fishing and fish farming practices have social and environmental impacts inconsistent with the values of the healthcare sector. Industrial-scale fishing is overfishing certain key species and threatening ecosystem health, and fish farming (aquaculture) is harming ecosystems with overuse of chemicals and antibiotics that can lead to antibiotic resistance.

Making better choices involves getting to know your fish and ideally, the people who fish or farm your seafood. Purchasing low on the food chain and locally, while avoiding seafood that has been overfished or raised in environmentally or socially destructive ways are good general principles. For more information, a recommended resource is Healthcare without Harm's Choosing Seafood for Healthcare.

Taking inspiration from traditional Indigenous practices can also be a good place to start. Over 50 species of wild fish from oceans, lakes, ponds, and rivers are fundamental to Indigenous culture and nutrition. Indigenous knowledge includes an awareness of harvesting seasons for particular species (e.g. salmon all summer, eulachon in spring, herring late winter into spring). Fish are caught using a variety of traditional methods including rakes, nets, or traps created with wood, branches, and roots found in the forest, and processed by wind drying, smoke curing, canning, and freezing. In Indigenous culture, no edible parts are wasted: head, eyes, and offal are all prepared and eaten.

Seaweed beds have provided highly nutritious food for thousands of years: seaweeds are rich in protein, calcium, iron, iodine, B vitamins, and vitamins A and C. Red laver, giant kelp, and dulse are the most common varieties. Because of their high salt content, seaweeds are mostly used to season various foods: they can be added to soups, cooked with salmon eggs, diced and toasted, dipped into fish grease, or mixed with rice.

Wild meat

Indigenous peoples consume a variety of wild meats. For many communities, moose meat is a staple food. The hunting season is in late summer and early fall. Traditionally the stomach and small and large intestine were eaten. Deer are also hunted in the fall when they are still fat. Deer liver is a source of iron as well as vitamins A and C. Small mammals such as rabbit, hare, ground squirrel, and beaver are hunted in all seasons. Very little was not used in some way. Common kinds of birds and eggs are harvested such as duck, grouse, ptarmigan, quails, oystercatcher, goose, and the eggs from seagulls.

The meat is eaten fresh, roasted, dried, smoked, or boiled and supplies protein, iron, B vitamins, and vitamin C. Most wild meat contains less saturated fat than beef, pork, and chicken.

Appendix

Choice of protein

Additional resources

Legumes	Legumes: Health Benefits and Culinary Approaches to Increase Intake
Plant-based meat substitutes	https://noharm-uscanada.org/content/us-canada/better-meat-alternative Food Scores (ranking system for processed foods)
Wild game meats and seaweed	Food safety: hunting Food safety: game meats
Eggs	Food Scores (ranking system for processed foods)
Insects	Insects as human food
Poultry	Antibiotics in meats Food Scores (ranking system for processed foods)
Dairy	Antibiotics in dairy Food Scores (ranking system for processed foods)
Seafood	Choosing seafood for healthcare Food Scores (ranking system for processed foods)

Pork	Antibiotics in meats Food Scores (ranking system for processed foods)
Red meats	Antibiotics in meats Food Scores (ranking system for processed foods)

Methodology

Ranking of the items in terms of sustainability is primarily based on a Life Cycle Assessment (LCA) of each item, which takes into account all the steps involved in producing the ingredient: production, manufacturing, packaging, distribution, and transportation. This information was derived from a meta-analysis across all available food groups with respect to a food's "global warming potential" (kg CO₂-eq/kg produced).⁴⁹

Global warming potential is the estimated equivalent emissions of carbon dioxide (CO₂), a greenhouse gas, per kg of ingredient.

It is important to note that this methodology ranks food from the sole environmental perspective of global warming potential, not taking into account other metrics such as fine particulate matter emissions, land and water use, and biodiversity loss⁵⁰. However, there is typically a strong correlation between sustainable environmental practice and animal welfare and social sustainability. For example, organic poultry have access to the outdoors, and organic feed means that farmworkers do not come in contact with synthetic fertilizers and pesticides.

Limited data is available for processed items in particular, but it was assumed that additives and additional steps involved in creating the product result in increased input of energy and increased CO₂ eq/kg. This assumption was also derived from the Environmental Working Group's Food Scores⁵¹.

Processed meats

The distinctive taste and colour of cured meats—including bacon, ham, and other processed deli meats—are due to the addition of synthetic nitrites and a lot of salt.

Nitrites have the potential to form nitrosamines in the human body, which are classified as "probably carcinogenic to humans."⁵² As a result there is a trend towards natural, "uncured" meats.

49 Clune et al., 2015.

50 Frischknecht et al., 2016

51 Environmental Working Group, 2018.

52 Song et al., 2015.

But descriptions of processed meats as “uncured” or “natural” are misleading. The synthetic additives are replaced by other ingredients such as celery powder or sea salt that contain significant amounts of naturally occurring nitrates, a small percentage of which can be transformed into nitrites on ingestion. Also, numerous studies have demonstrated similar levels of nitrites in meats labelled “cured” and “uncured”. Always prioritize meats in their natural state, or minimally processed meats. Processed meats have been changed from the natural state using additional ingredients, additives, and/or preservatives. In addition, this includes physical transformations such as pureeing, cubing, or cooking. The more steps taken to transform the meat, the less sustainable it is.

Processed meats are also often rich in salt and saturated fats and do not represent a good source of protein for that reason.

Organic versus conventional dairy

Organic milk is produced without the use of pesticides, synthetic fertilizer or antibiotics. A study of Life Cycle Assessments comparing conventional and organic milk production in Livestock Production Science found that organic milk reduces synthetic pesticide use but uses more land per unit of milk⁵³.

Ultimately, however, organic methods cover the entire supply chain of milk production, including feed, access to pasture, and use of antibiotics (this is upheld by certification bodies who regularly check farms to ensure that they continue to comply with organic standards). Bearing these factors in mind, organic dairy production can be considered more sustainable than conventional production, in spite of greater land use.

References

Amos, H. (2014, June 10). Unsustainable shrimp a jumbo problem. Retrieved from <https://news.ubc.ca/2014/06/03/unsustainable-shrimp-a-jumbo-problem/>

Anaphylaxis Campaign. (2017). Quorn. Retrieved from <https://www.anaphylaxis.org.uk/knowledgebase/quorn/>

Benjamin, N. 2000. Nitrates in the human diet - good or bad?. *Annales de zootechnie*, INRA/EDP Sciences, 49 (3), pp.207-216.

Boer, I. J. (2003). Environmental impact assessment of conventional and organic milk production. *Livestock Production Science*, 80(1-2), 69-77. doi:10.1016/s0301-6226(02)00322-6

Boggia, A., Paolotti, L., & Castellini, C. (2010). Environmental impact evaluation of conventional, organic and organic-plus poultry production systems using life cycle assessment. *Worlds Poultry Science Journal*, 66(01), 95-114. doi:10.1017/s0043933910000103

British Columbia Society for the Prevention of Cruelty to Animals. (2015). *Canada Organic Standards - Assessing Improvements to Farm Animal Welfare: A Comparison of 2011 and 2015 Standards for Livestock Production*. Retrieved from <https://spca.bc.ca/wp-content/uploads/organic-standards-improvements.pdf>

Canadian General Standards Board. (2018). *Organic production systems- General principles and management standards*. Retrieved from http://publications.gc.ca/collections/collection_2018/ongc-cgsb/P29-32-310-2018-eng.pdf

Chicken Farmers of Canada. (2018, January 12). *The Wheel of Chicken - Understanding Your Choices*. Retrieved from <https://www.chickenfarmers.ca/the-wheel-of-chicken-understanding-your-choices/>

Clune, S., Crossin, E., & Verghese, K. (2017). Systematic review of greenhouse gas emissions for different fresh food categories. *Journal of Cleaner Production*, 140, 766-783. doi:10.1016/j.jclepro.2016.04.082

Coyle, D. (2017). *Are organ meats healthy?* Retrieved from <https://www.healthline.com/nutrition/organ-meats#section6>

Dietitians of Canada. (2013). *Food Sources of Omega-3 Fats*. Retrieved from <https://www.dietitians.ca/getattachment/de95e92c-3fb3-40db-b457-173de89bdc3a/FACTSHEET-Food-Sources-of-Omega-3-Fats.pdf.aspx>

Environmental Working Group. (2018). *EWG's Food Scores*. Retrieved from <https://www.ewg.org/foodscores#.WwblJPwa34>

Fehrenbach, K. S., Righter, A. C., & Santo, R. E. (2015). A critical examination of the available data sources for estimating meat and protein consumption in the USA. *Public Health Nutrition*, 19(08), 1358-1367. doi:10.1017/s1368980015003055

Food and Agriculture Organization of the United States. (n.d.). *Key facts on food loss and waste you should know!* Retrieved from <http://www.fao.org/save-food/resources/keyfindings/en/>

Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. *Tackling climate change through livestock—A global assessment of emissions and mitigation opportunities*. Food and Agriculture Organization of the United Nations (FAO), Rome.

Gunnars, K. (2018, May 7). *Grass-Fed vs. Grain-Fed Beef - What's the Difference?* Retrieved from <https://www.healthline.com/nutrition/grass-fed-vs-grain-fed-beef>

Healthcare Without Harm. (2017). *Balanced Menus*. Retrieved from https://noharm-uscanada.org/sites/default/files/documents-files/469/BalancedMenus_Hybrid_R8_Booklet_hiRes.pdf

Health Care Without Harm. (2017). *Redefining Protein: Adjusting Diets to Protect Public Health and Conserve Resources*.

Ingested nitrate and nitrite, and cyanobacterial peptide toxins. (2010). Lyon: IARC Press.

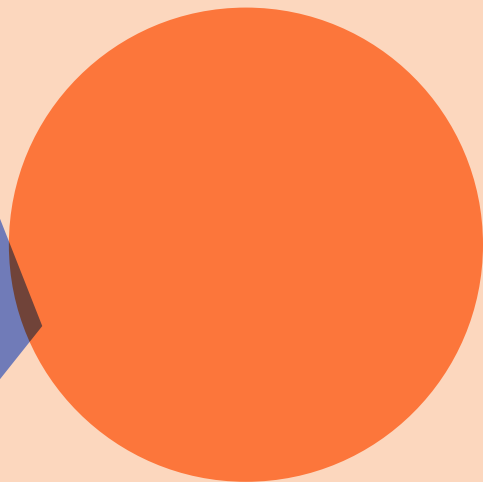
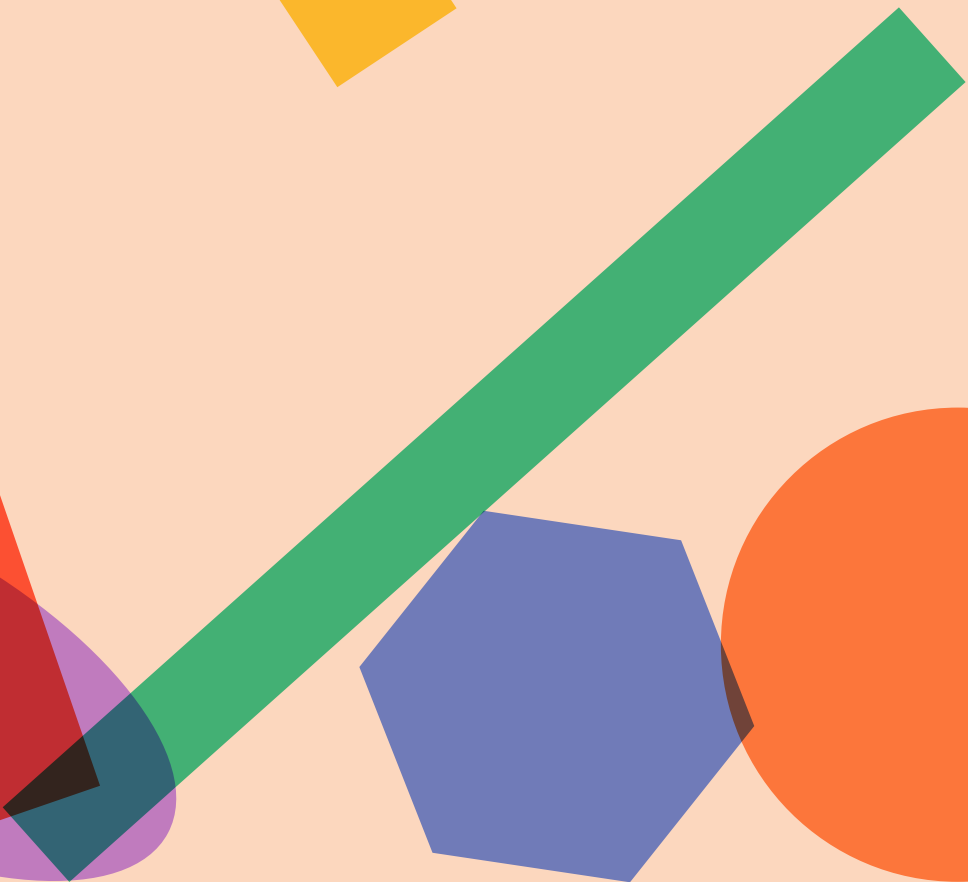
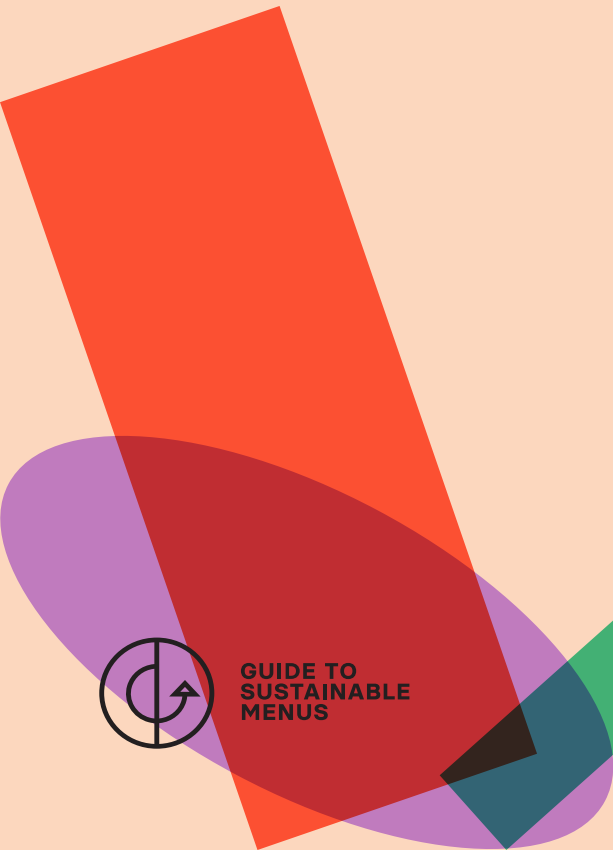
IPES-Food. 2017. *Unravelling the Food–Health Nexus: Addressing practices, political economy, and power relations to build healthier food systems*. The Global Alliance for the Future of Food and IPES-Food.

Jacquet, J. (2017, January 23). *Why oysters, mussels and clams could hold the key to more ethical fish farming*. Retrieved from <https://www.theguardian.com/sustainable-business/2017/jan/23/aquaculture-bivalves-oysters-factory-farming-environment>

Laanela, M. (2016, October 20). *What's the difference between regular and organic milk?* | CBC News. Retrieved from <https://www.cbc.ca/news/canada/british-columbia/milk-antibiotics-1.3803799>

Martin, M. J., Thottathil, S. E., & Newman, T. B. (2015). *Antibiotics Overuse in Animal Agriculture: A Call to Action for Health Care Providers*. *American Journal of Public Health*, 105(12), 2409-2410. doi:10.2105/ajph.2015.302870

- Medeiros, L. C., Busboon, J. R., Field, R. A., Williams, J. C., Miller, G. J., & Holmes, B. (2002). Nutritional Content of Game Meat: Wyoming Extension. Retrieved from <http://www.wyomingextension.org/agpubs/pubs/B920R.pdf>
- Mongeon, M., & Summerhayes, B. (2010 November). Organic Dairy Production. Retrieved from <http://www.omafra.gov.on.ca/english/livestock/dairy/facts/10-087.htm>
- Nolte, K. (n.d.). Epazote : Yuma Country Cooperative Extension. Retrieved from <https://cals.arizona.edu/fps/sites/cals.arizona.edu/fps/files/cotw/Epazote.pdf>
- Ranganathan, J. et al. 2016. "Shifting Diets for a Sustainable Food Future." Working Paper, Installment 11 of Creating a Sustainable Food Future. Washington, DC: World Resources Institute. Accessible at <http://www.worldresourcesreport.org>
- Satija, Ambika, and Frank B. Hu. "Plant-Based Diets and Cardiovascular Health." Trends in Cardiovascular Medicine, 2018, doi:10.1016/j.tcm.2018.02.004.
- Shepon, A., Eshel, G., Noor, E., & Milo, R. (2016). Energy and protein feed-to-food conversion efficiencies in the US and potential food security gains from dietary changes. Environmental Research Letters, 11(10), 105002.
- Simpson, G. Introduction to Organic Swine Production [Powerpoint slides]. Retrieved from [https://www.agrireseau.net/agriculturebiologique/documents/FS12_Organic_Production_Greg_Simpson.pdf](https://www.agrireseau.net/agriculturebiologique/documents/FS12_Organic_Pork_Production_Greg_Simpson.pdf)
- Song, P., Wu, L., & Guan, W. (2015). Dietary Nitrates, Nitrites, and Nitrosamines Intake and the Risk of Gastric Cancer: A Meta-Analysis. Nutrients, 7(12), 9872-9895. doi:10.3390/nu7125505
- Steele, E. M., Raubenheimer, D., Simpson, S. J., Baraldi, L. G., & Monteiro, C. A. (2017). Ultra-processed foods, protein leverage and energy intake in the USA. Public Health Nutrition, 21(01), 114-124. doi:10.1017/s1368980017001574
- Sun, Q. (2012). Red Meat Consumption and Mortality. Archives of Internal Medicine, 172(7), 555. doi:10.1001/archinternmed.2011.2287
- Teague, W. R., Apfelbaum, S., Lal, R., Kreuter, U. P., Rowntree, J., Davies, C. A., . . . Byck, P. (2016). The role of ruminants in reducing agriculture's carbon footprint in North America. Journal of Soil and Water Conservation, 71(2), 156-164. doi:10.2489/jswc.71.2.156
- Zarshenas, M. M., Moein, M., Samani, S. M., & Petramfar, P. (2013). An overview on ajwain (*Trachyspermum ammi*) pharmacological effects; modern and traditional. Journal of Natural Remedies, 14(1), 98-105.



GUIDE TO
SUSTAINABLE
MENUS