



GUIDE TO  
SUSTAINABLE  
MENUS



# A guide to sustainable menus

A step by step approach  
to sustainability



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Chapter 5

# Choosing your sustainable starch

**After your protein is chosen, starches should be added as the next step. First, create your starch standards according to the needs of your clientele. Then, identify meals that already contain sufficient starch (such as pasta). Last, be sure to choose a variety of starches: this contributes to creating a menu that represents a well-rounded diet.**

**This chapter will guide you through these steps.**



# Sustainable starches

## Why eat starches?

Starches are an essential source of complex carbohydrates, which are broken down into sugars in the body to give energy. Starches come from either a) cereal or grain crops such as wheat, rice, barley or b) root and tuber crops such as potatoes, cassavas, and parsnips. Unrefined whole grains are an important source of fibre, which contribute to intestinal and immune-system health, lower blood cholesterol, and induce satiety. Some can also be a good source of protein such as quinoa, spelt, buckwheat and farro. In addition, they are a good source of essential micronutrients such as B vitamins, magnesium, calcium, and iron.<sup>54 55</sup> Root and tuber crops also contain antioxidant properties and help maintain blood sugar and cholesterol.<sup>56</sup>

## Why are sustainable starches important?

Cereal or grain crops can be used to maintain soil health in crop rotation programs. These crops grow with dense cover, reducing soil erosion and absorbing excess nutrients that might otherwise leach out in water runoff. They also act as a weed suppressant, preventing the need for application of herbicides<sup>57</sup>.

Root and tuber crops are staple crops for many cultures around the world, particularly in Africa and Asia. They are an affordable source of nutrition and a major source of income in developing countries<sup>58</sup>. In addition, they are “nutritionally productive.” For example, for every cubic metre of water used in cultivation, potatoes produce twice as many calories and four times as much calcium as rice<sup>59</sup>.

54 Health Canada, 2012.

55 Health Canada, 2012.

56 Chandrasekara and Kumar, 2016.

57 North American Miller's Association, 2011.

58 National Resources Institute, 2018.

59 FAO, 2008.

## What is the impact of sustainable starches on health?

Whole grains and unprocessed starches are key to maintaining a healthy diet and environment. North American diets are often rich in highly refined and processed starchy foods such as white bread, fried potatoes, and ready-to-eat pizzas and rolls. These have little nutritional value and are associated with the prevalence of chronic diseases such as type 2 diabetes and coronary heart disease<sup>60</sup>. In contrast, whole grains contribute to lowering the risks of heart disease, stroke, and some cancers.<sup>61</sup> Potato—one of the few starches that can also be considered as a vegetable—can only retain its antioxidants (phenolic acid, flavonoid, vitamin C) when unprocessed or minimally processed.

## How can I prioritize incorporating sustainable starch?

The amount of starch served is controlled according to the treatment plan (diet with low or high content as determined) and should not exceed clientele needs.

- Starches are part of a varied and complete diet (complex carbohydrate, B vitamins, iron, zinc, magnesium, fibre).
- A large variety of starch choices should be provided, with the majority of starches chosen according to sustainable criteria.
- Whole grains should be available every day for clients whose diet allows it.
- Food services and professional dietitians must provide education to increase amount and variety of whole grains in diets (for example, information on quinoa and how it can be served).
- Recipes should reflect the cultural diversity of the client base on site, and should include traditional Indigenous foods where appropriate.

60 Gross, Li, Ford, & Liu, 2004

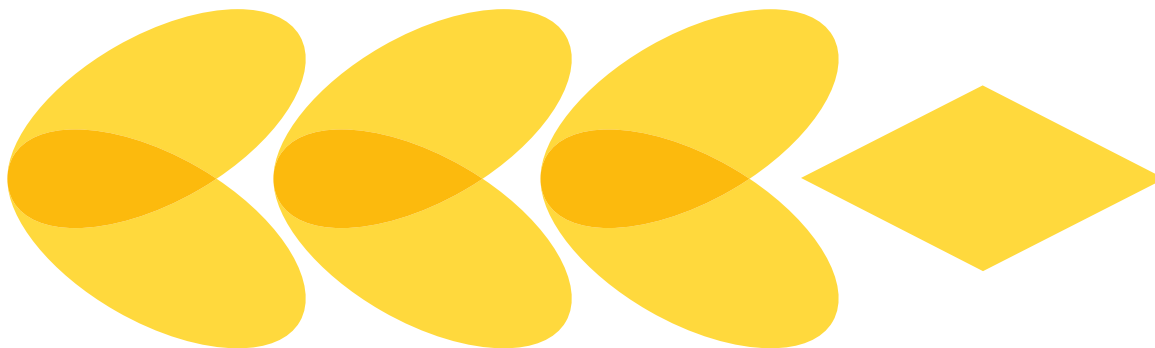
61 Dietitians of Canada, 2018.

# 2

## What are my starch standards?

Before choosing starches for a menu, meal standards must be written. These are guidelines that you need to work with, such as dietary restrictions, menu format, the kitchen's capacities, the preferences of patients, etc. Here are some examples of what you could write as a chart standard. If you have different types of clientele requiring different standards, use columns such as the last two to show for which clientele items apply (e.g. elderly, youth, acute care patients, etc.).

Starch standards	Clientele a	Clientele b
A selection of bread is available, particularly whole wheat and whole grain bread	X	X
A variety of sustainable starch must be served throughout the menu cycle	X	
Dessert with cereal as the primary ingredient should be offered	X	X
Two choices of starch are available at each meal	X	X
Breakfast menu: offer 1 type of hot cereal and 4 choices of cold cereal including whole grains choices	X	



# 3

## Making sustainable starch choices

### LEGEND FOR CHARTS A) AND B).

#### Choice of starch

#### Tips for choosing

##### Ranking/Order

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

##### Variety: Colour

Colour helps you choose variety for the weekly menu. Use it in your menu template to easily see the repetition/variety.

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 starch served. 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 cost column can be used to determine the cost per portion, the cost of the meal including starches, or any other metric that is most useful for you to keep track of your spending.









According to the EAT-Lancet commission, North Americans should reduce their consumption of starchy vegetables (potatoes) to 50 g per day (-170%) and increase whole grain consumption (rice, wheat, corn) to 230 g per day. However, recommendations in the yellow column of the tables (on what to change in order to increase sustainability generally) also take cultural habits into consideration.

## A) BREAKFAST STARCHES

<b>Choice of starch</b> (listed from most to least sustainable)	<b>Total number of choices per week</b> (quantity)	<b>Current Cost</b>	<b>To make menus more sustainable, generally</b>	<b>Total number of choices per week</b> (quantity)	<b>New Cost</b>
 Root vegetable			Reduce or leave unchanged or increase		
 Ancient grain			Increase variety		
 Oat			Increase variety		
 Barley			Increase variety		
 Quinoa			Increase variety		
 Baked goods/ breakfast cereal			Increase variety of whole cereal		



## A) LUNCH AND DINNER STARCHES

<b>Choice of starch</b> (listed from most to least sustainable)	<b>Total number of choices per week</b> (quantity)	<b>Current Cost</b>	<b>To make menus more sustainable, generally</b>	<b>Total number of choices per week</b> (quantity)	<b>New Cost</b>
 Root vegetable			Reduce or leave unchanged or increase variety and fresh choices		
 Ancient grain			Increase variety		
 Oat			Increase variety		
 Barley			Increase variety		
 Quinoa			Increase variety		
 Pasta/noodles			Increase whole-grain variety		
 Baked goods			Reduce or increase whole ingredients		
 Rice			Reduce, or increase Canadian wild rice		

# How can I change?

## B) CHANGES POSSIBLE

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

CHOICE OF STARCH  
(listed from most  
to least sustainable)

### 1. Root vegetables



POTATOES - CASSAVA - PARSNIPS - RUTABAGA - SUNCHOKE -  
SWEET POTATOES - PLANTAINS - TARO - YAMS  
(NOT IN ORDER OF SUSTAINABILITY)

TIPS FOR CHOOSING

- **Avoid processed, pre-fried, and added-sodium products.**
  - Instead, prefer fresh root vegetables that are pre-peeled and pre-cut. Fried roots contain acrylamide, a chemical that occurs when cooking carbohydrate-rich foods at high temperatures—it is a potential risk to human health<sup>62</sup>.
- **Choose organic root vegetables.**
  - Conventionally grown potatoes were found to have more pesticide residues by weight than any other crop<sup>63</sup>.
- **Choose a large variety of seasonal root vegetables.**
  - In the fall and winter, look for parsnips, rutabagas, and sunchokes.
- **Choose regional suppliers from nearby provinces and states.**

TIPS FOR INCLUSION  
IN YOUR RECIPES

- **Prepare**
  - Keep your pre-peeled root vegetables in cold water in the fridge to maintain firmness. Change the water every 24 hours.
  - Cut into smaller pieces to cook quickly and thoroughly.
  - To increase fibre, keep the skin on fresh potatoes when serving.
- **Cook**
  - Root vegetables are versatile: they can be steamed, boiled, pureed, baked, or roasted.
  - **Avoid** frying them or, if you must, do not offer more than once a week on menu cycle.
- **Replace**
  - Take advantage of the naturally sweet flavour of root vegetables: for example, try sweet potatoes in a dessert dish, such as a pie.
  - To introduce new root vegetables, create a recipe that contains half potato and half of the new root vegetable, for example.
  - Try a sweet potato or radish and turnip hash with fried eggs for breakfast.

### 2. Ancient grains



KAMUT - SORGHUM - AMARANTH - MILLET - SPELT - FREEKEH -  
FARRO

- **Choose organic grains.**
  - Organic farming results in higher soil fertility and biodiversity, important factors in preserving the environment<sup>64</sup>.
- **Choose fair trade grains.**
  - Look for fair trade options for certain grains such as farro, which may not be grown in Canada.
- **Choose regional suppliers from nearby provinces and states.**

- **Prepare**
  - Toast grains in a dry pan to enhance the naturally nutty flavour.
- **Cook**
  - Try offering grain bowls, with ancient grains as the base and varying colours and textures as toppings.
- **Replace**
  - Begin by serving ancient grains with a 50/50 mix of traditional starches, such as rice. This will help transition your clientele into eating ancient grains.
  - Add different kinds of grain flour into recipes for muffins, bread, pancakes, cake, etc.

62 Health Canada, 2017.

63 EWG, 2017.

64 Maeder et al, 2002.

CHOICE OF PROTEIN  
(listed from most to least sustainable)

### 3. Oats



GROATS - STEEL-CUT - ROLLED - INSTANT

#### TIPS FOR CHOOSING

- **Choose organic oats.**
  - Organic farming reduces pollution by not using synthetic fertilizers, preventing the runoff of chemicals into bodies of water<sup>65</sup>.
- **Choose minimally processed oats.**
  - Groats contain the endosperm and bran, which retain fibre, B vitamins and protein. In contrast, instant oats lose these nutrients during processing; instead a long list of ingredients are added to replace the vitamins and give a texture similar to that of regular oats.
- **Choose regional suppliers from nearby provinces and states.**

#### TIPS FOR INCLUSION IN YOUR RECIPES

- **Prepare**
  - Groats and steel-cut oats take longer to prepare - plan time in advance.
- **Cook**
  - Cook oats with dairy or other plant-based milk alternatives for a creamy flavour with added nutritional value.
  - Add flavour by cooking with fresh or frozen fruit and a little maple syrup or honey.
- **Replace**
  - Instead of instant oats, offer groats or steel-cut oats. These alternatives will keep clientele full for a longer period of time (due to the protein content). If cooking time is a problem, prefer rolled oats.

### 4. Barley



WHOLE GRAIN - HULLED - POT - PEARL

- **Choose organic barley.**
  - Organic farming keeps soil healthy by not using synthetic fertilizers, preventing erosion, and enhancing nutrient and water absorption capabilities<sup>66</sup>.
- **Choose pot or whole-grain barley.**
  - Most of the bran—the outermost layer of barley - is present, which ensures a complete source of B vitamins and minerals. Pearl barley is more polished than pot barley (some bran is left) and so contains fewer nutrients.
- **Choose regional suppliers from nearby provinces and states.**

- **Prepare**
  - Barley has a subtle nutty taste that blends well with other flavours and won't overpower a dish. Cook barley in a broth for optimal flavour.
- **Cook**
  - Ensure a colour and texture contrast with food served with barley bowls.
- **Replace**
  - Offer barley instead of rice as a side dish.
  - Create barley salads, chilis, stews.
  - Use barley as a thickening agent for hamburger patties, mousse, and pudding.
  - Because barley can agglutinate when kept warm, mix it with other types of grain to obtain an accompanying starch that is ideally suited to a food service context (e.g. a mixture of barley, whole oats and wild rice).

CHOICE OF PROTEIN  
(listed from most to least  
sustainable)

## 5. Quinoa



RED - BLACK - WHITE

### TIPS FOR CHOOSING

- **Choose fair trade quinoa.**
  - Quinoa is typically grown in South America; ensure purchases are certified fair trade, which means that they support values of social, environmental, and economic sustainability.
  - Production of Canadian quinoa is beginning to increase; local sourcing could be available in the near future.

### TIPS FOR INCLUSION IN YOUR RECIPES

- **Prepare**
  - Use quinoa in a variety of hot and cold dishes.
  - Rinse uncooked quinoa under running water until water runs clear (takes about a minute) to remove the bitter taste.
- **Cook**
  - Instead of using lettuce, offer a quinoa-based salad at the salad bar.
- **Replace**
  - Quinoa contains a full set of amino acids, making it a great protein replacement. Pair it with another familiar, popular grain to better transition your clientele.
  - Replace a part of flour with quinoa in muffins for breakfast and desserts.

## 6. Pasta/noodles



MADE FROM THE FOLLOWING INGREDIENTS:  
WHOLE GRAINS - LEGUMES - RICE - WHITE FLOUR - EGG

- **Choose whole-grain pasta.**
  - Whole-grain pasta contains bran—the outermost layer of the grain—which is high in B vitamins and minerals. This is typically stripped in refined pastas.
- **Choose uncommon varieties of whole grain, such as ancient grains.**
  - Traditional wheat is typically produced by extensive monoculture that does not contribute to biodiversity.
- **Choose regional suppliers from nearby provinces and states.**
  - Canadian durum wheat is high in protein and low in starch compared to other types of wheat<sup>67</sup>. However, look for organic options, since synthetic pesticide use may be high.

- **Prepare**
  - Pasta and noodles are used in many cultures— increase your diversity of dishes by looking to different menus!
  - Try different grains in pasta (quinoa, barley).
  - Use whole-grain pasta with heavy-sauce meals (e.g. with parmesan or other cheese).
- **Cook**
  - To begin the switch to whole-grain pasta; start half and half with white pasta (be aware that cooking time is not the same!).
  - Save some of the pasta water used for cooking—this starchy water can add substance to sauces.
- **Replace**
  - Look for pasta that contains legume flour such as chickpea for added protein.

CHOICE OF PROTEIN  
(listed from most to least  
sustainable)

## 7. Baked goods

**BREAD - BAGELS - TORTILLAS - PITAS - PIZZAS - PASTRIES**  
MADE FROM THE FOLLOWING TYPES OF FLOUR: - OAT - BULGUR  
- RYE - SPELT - CHICKPEA - LEGUME - SOY - BARLEY - MAIZE -  
CORN - WHEAT - RICE

### TIPS FOR CHOOSING

- **Avoid high-sugar products.**
  - Read the nutrition label to ensure that sugar is not a prominent ingredient.
- **Choose whole ingredients with minimal preservatives and additives.**
  - Store-baked goods often have long ingredient lists to maintain shelf life; for example, instead of using whole eggs, dried egg-white powder is used.
- **Choose whole-grain products with minimal other ingredients.**
  - A product that contains whole grains is not necessarily healthy—ensure that the product is high in fibre.
- **Consider sprouted grains.**
  - These are products made with whole-grain seeds that have just begun to sprout—resulting in more available nutrients and amino acids, and less starch<sup>68</sup>.
- **Choose regional suppliers from nearby provinces and states.**

### TIPS FOR INCLUSION IN YOUR RECIPES

- **Prepare**
  - Homemade baked goods can be a way to create new flavours with fewer ingredients, but requires more time—plan in advance. Possibly an activity to suggest to the leisure/activity department!
- **Bake**
  - Try bannock (see traditional Indigenous starches) with blueberries or raisins for added flavour. It is possible to cook bannock without frying.
  - Consider adding seeds, berries, and oat groats for extra nutritional value.
- **Replace**
  - Try substituting white wheat flour with whole-grain flour when baking. Begin with a half-quantity of each to facilitate the switch.
  - Adding legume flour can also increase the protein and fibre content of baked goods.
  - If commercial products must be used, ask your supplier if he can modify his recipe (ingredients) to meet your sustainable criteria.

## 8. Breakfast cereals

(INCLUDING BABY CEREALS)  
**WHOLE CEREALS - PROCESSED CEREALS**

- **Avoid colourants and additives in cereal.**
  - Processed cereals are often high sources of artificial food dyes.
    - See the appendix for information on artificial colourants and flavourings.
- **Limit processed rice cereal or rice-containing processed foods.**
  - These foods contain high amounts of arsenic: examples include CHEX cereal, Rice Krispies, and rice cakes, particularly in infant rice cereals<sup>69 70</sup>.
- **Choose cereals with little or no added sugar.**
  - Many breakfast cereals contain enough sugar to contribute up to 50% of total daily calorie intake. Child-targeted cereals in particular are significantly higher in sodium and sugar, while lower in fibre and protein<sup>71</sup>.
- **Choose cereals that are high in fibre and protein.**
  - These cereals start off the day strong and will keep your clientele feeling full. They are also associated with a lower risk of diabetes and cardiovascular disease<sup>72</sup>.
- **Choose bulk cereal.**
  - To reduce the packaging, use reusable dishware to portion cereal or leave big boxes on the floors for self-service.

68 Whole Grains Council, 2018.

69 Consumer Reports, 2014.

70 Houlihan, 2017.

71 Kent, Cameron, & Philippe, 2017.

72 Williams, 2014.

CHOICE OF PROTEIN  
(listed from most to least  
sustainable)

## 9. Rice



**CANADIAN WILD RICE - PARBOILED - WHITE - JASMINE - BASMATI  
- JAPANESE (SHORT-GRAIN) - BROWN**

TIPS FOR CHOOSING

- **Limit rice consumption.**
  - Rice can be a valuable source of nutrition but it inevitably contains higher levels of arsenic, a toxic compound naturally occurring in foods. Take precautions with rice consumption and ensure that rice is not the primary starch served daily for your clientele.
  - See the appendix for details on consumption of arsenic.
- **Choose regional variety.**
  - Canadian wild rice is the only native grain.
- **Choose organic rice**
  - from a reputable company that is transparent about its growing practices and tests for arsenic.

TIPS FOR INCLUSION  
IN YOUR RECIPES

- **Prepare**
  - Soak rice overnight in a 5:1 ratio of water to rice to cut arsenic levels by up to 80%.<sup>74</sup>
- **Cook**
  - Cook rice in a much larger volume of water (up to 12:1 ratio of water to rice) to remove arsenic levels by up to 60%.<sup>75</sup>
- **Replace**
  - Replace rice with a mixture of whole-grain including a small amount of rice (with barley for example).
  - Vary the type of rice used throughout the week. Brown rice has 80% more arsenic on average than white rice. However, brown rice overall has more nutrients; brown basmati from California, India, or Pakistan is the best choice; they have about a third less arsenic than other varieties of brown rice.<sup>76</sup>

## 10. Processed root vegetables



**DEHYDRATED (POWDER / PARTICLES) - FRIES - CHIPS**

- **Choose processed starches with no additives.**
  - Limit your consumption of processed root vegetables. Dehydrated potatoes have minimal vitamin C content compared to fresh potatoes; fries and chips often have high amounts of sodium, fat, and trace amounts of acrylamide, a carcinogen.<sup>73</sup>



73 Health Canada, 2017.

74 Mosley, 2017.

75 Carey et al., 2015.

76 Consumer Reports, 2014.

# 4

## Controlling starch waste

### Save the starch

- **Freeze bread products.**
  - Freeze any type of bread, bread crust, or expired bread and store (for up to 6 months) to use in recipes.
  - Freeze natural starch products in single-serve portions for specials.
- **Store peeled potatoes in water.**
  - If peeled potatoes are bought, put them into water as fast as possible to prevent oxidation.
  - Be sure to cook them before they turn black. If they turn black they can still be used, but may taste bad—remove black spots before using them.

### Repurpose the starch

- **Re-bake bread products.**
  - Make bread pudding as dessert.
  - Bake breadcrumbs for meat patties.
  - Bake croutons to serve at the salad bar or in French onion soup.
- **Re-use starch leftovers.**
  - In salad (rice, potato, barley, pasta)
  - In a soup or cream soup to thicken
- **Fresh baked potato leftovers can be used in:**
  - breakfast roasted potato
  - meat stew or pie
  - Rice leftovers can be used in:
    - stuffed recipe (cabbage rolls, stuffed peppers)

# 5

## Learning about traditional Indigenous starch sources

**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.**

## Wild rice

Wild rice, the only grain native to Canada, has been harvested for thousands of years in Ontario, Saskatchewan, and Manitoba<sup>77</sup>. The Ojibwa people recognize it as man-o-min; from Manitou (The Great Spirit) and meenun (delicacy). “The Ojibwa would paddle through the rice beds and sweep the long stalks of the plant over the sides of the canoe with sticks so the green rice would fall off and fill the canoe. Then they would let it dry on shore, roast it till it turned nut-brown, and toss it into the air from blankets, so the husks would blow away in the wind.”<sup>78</sup>

## Maize

Maize was introduced to Canada from the southern parts of North America and quickly became integral to Indigenous Peoples, with the Iroquois recognizing corn as one of the “Three Sisters”: corn, beans, and squash.<sup>79</sup>

It was said that the earth began when “Sky Woman” who lived in the upper world peered through a hole in the sky and fell through to an endless sea. The animals saw her coming, so they took the soil from the bottom of the sea and spread it onto the back of a giant turtle to provide a safe place for her to land. This “Turtle Island” is now what we call North America. Sky Woman had become pregnant before she fell. When she landed, she gave birth to a daughter. When the daughter grew into a young woman, she also became pregnant (by the West Wind). She died while giving birth to twin boys. Sky Woman buried her daughter in the “new earth.” From her grave grew three sacred plants—corn, beans, and squash. These plants provided food for her sons, and later, for all of humanity. These special gifts ensured the survival of the Iroquois people.<sup>80</sup>

## Root vegetables

Root vegetables not only were a source of nutrition but also had economic and ceremonial values. Large roots were gathered while small roots were left in the ground for future cultivation. Some nations held a “First Roots” ceremony to show respect for roots prior to digging them out of the ground. Once harvested, these roots were often dried, traded, and kept as a “back-up” in times of food shortage.<sup>81</sup>

77 Chavich, 2007.

78 Indian Affairs and Northern Development, Canada, 1998.

79 Wabano Centre for Aboriginal Health, 2014.

80 Erney, 1996.

81 First Nations Health Authority, 2014.



“As early as 1800 BC, ancestors of the Katzie First Nation in B.C.’s Lower Mainland were engineering the wetland environment to increase the yield of a valuable semi-aquatic plant known as a wapato... prized as a valuable trading commodity and served as an important source of starch over the winter months.”<sup>82</sup>

## Bannock

Indigenous bannock was first made using ground wild plant roots and bulbs such as bracken or camas<sup>83</sup>. Modern-day bannock, using wheat flour, was introduced by European settlers. It is a hardy source of carbohydrates, durable in transportation and easy to prepare. Today, it is recognized as an empowering comfort food, but many variants exist: fried, baked, wheat flour, plant roots, etc.

# Appendix

## Arsenic consumption

See [Health Canada’s information page](#) on arsenic.

Exposure to arsenic, particularly during pregnancy, can be a public health concern. Consumption is linked with chronic diseases such as diabetes, heart disease, and various forms of cancer<sup>84</sup>. Arsenic, a heavy metal, occurs naturally in soil and water, but rice has a much stronger ability to uptake arsenic than other plants. Rice is linked to higher proportions of inorganic arsenic, the most dangerous form over long-term exposure, which can lead to human cancers and damage to the gastrointestinal tract.<sup>85</sup> Studies show that just a single serving of processed rice foods can exceed the recommended exposure for arsenic in children for an entire week. Rice paddies are also one of the largest human sources of methane, and rice is the world’s second-most produced staple crop.<sup>86</sup>

82 Omand, 2016.

83 Colombo, 2006

84 Karagas et al., 1998; Hopenhayn-Rich, et al., 1998; Tsenget al., 2003; Hassan et al., 2017.

85 Health Canada, 2017.

86 van Groenigen, van Kessel, & Hungate, 2012.

## Additives

See [Health Canada's complete list of approved additives](#).

### ARTIFICIAL FLAVOURINGS

The chemical composition of artificial flavours and natural flavours are the same. The only difference is the source of the chemicals: synthesized from numerous chemicals in the former or derived from numerous chemicals found in plants and/or foods in the latter.<sup>87</sup> Natural does not necessarily mean “good” or “safe” and neither does artificial. Ultimately, dosage dictates toxicity: flavourings are safe for consumption in appropriate amounts.

### ARTIFICIAL COLOURING, ARTIFICIAL FOOD COLOURANTS (AFCS)

Most of the controversy surrounding artificial food colourants (AFCs) involves links between its consumption and children's behaviour, and attention deficit disorder in particular. It is statistically challenging to come to a hard conclusion of the effect of one variable on the other because of the variance in data collection and methodologies over the past 35 years.<sup>88</sup> Ultimately, the United States Food and Drug Administration along with the European Food Safety Authority have concluded that there is no substantial link between the tested colourants and behavioural effects.<sup>89</sup> Again, dosage dictates toxicity: artificial colourants are safe for consumption in appropriate amounts.

### ARTIFICIAL SWEETENERS

Artificial sweeteners are a sugar substitute which can either come in low-calorie or zero-calorie forms. They are commonly used by diabetic patients and those looking to lose weight.<sup>90</sup> However, few studies support their efficacy: most provide evidence of their contribution to high blood sugar and obesity as a result of altering the gut microbiota.<sup>91 92</sup>

## Genetically modified organisms (GMOs), genetic engineering (GE), genetically modified (GM)

Crops have been genetically modified for thousands of years. Through plant breeding and artificial selection, we have been able

87 Bloom, 2017.

88 Nigg et al., 2012.

89 International Food Information Council (IFIC) & U.S. Food and Drug Administration (FDA), 2010.

90 Dietitians of Canada, 2018.

91 Suez et al., 2014.

92 Feehley & Nagler, 2014.

to domesticate plants into the fruits and vegetables we consume today.<sup>93</sup> Genetic engineering is a new technology for genetically modifying crops. Before a genetically engineered crop is approved for growth and sale in Canada it must undergo a rigorous assessment by Health Canada to ensure it is safe for human consumption.<sup>94</sup> Genetic engineering is used in several different forms of pesticides (a term that includes herbicides, insecticides and fungicides).<sup>95</sup> GM crops are commonly genetically engineered to resist herbicides that may be used to control weeds. However, the use of these crops prompts the proliferation of herbicide-resistant weeds, increasing farmers' reliance on chemical herbicides and allowing herbicide-resistant weeds to proliferate.<sup>96</sup> The chief concerns with GM crops arise from the uncertainty related to the long-term health effects of both consumption and the associated increased use of herbicides and pesticides. Dietitians of Canada and Health Canada state that there are no such effects.<sup>97 98</sup> However, Health Care Without Harm encourages healthcare facilities to refrain from purchasing genetically engineered foods due to evidence of risks worldwide.<sup>99</sup> In Canada, four GM crops are currently grown: corn, soybean, canola, and sugar beet.<sup>100</sup>

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93 Gepts, 2001.

94 Health Canada, 2012.

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96 Gilbert, 2013.

97 Dietitians of Canada, n.d.

98 Health Canada, 2018.

99 Healthcare Without Harm, n.d.

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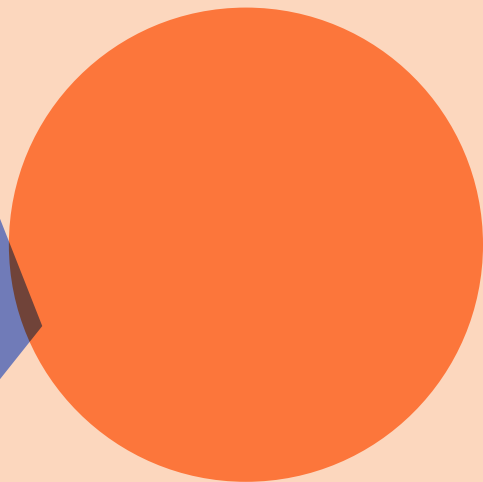
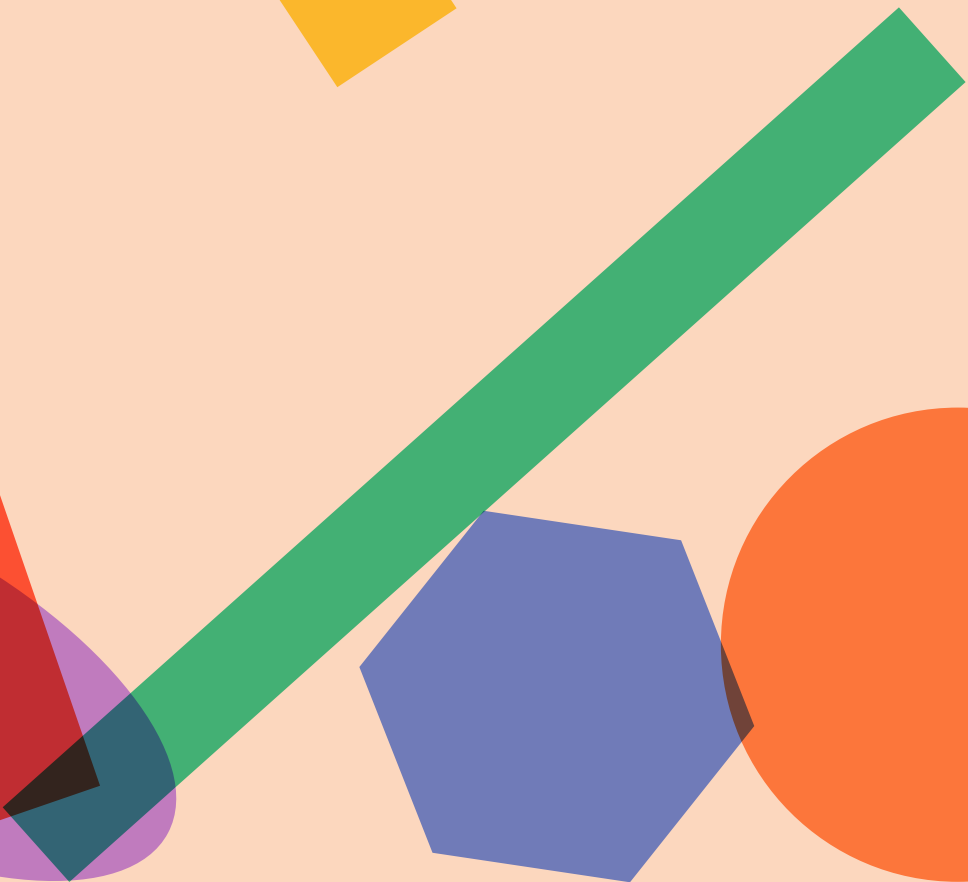
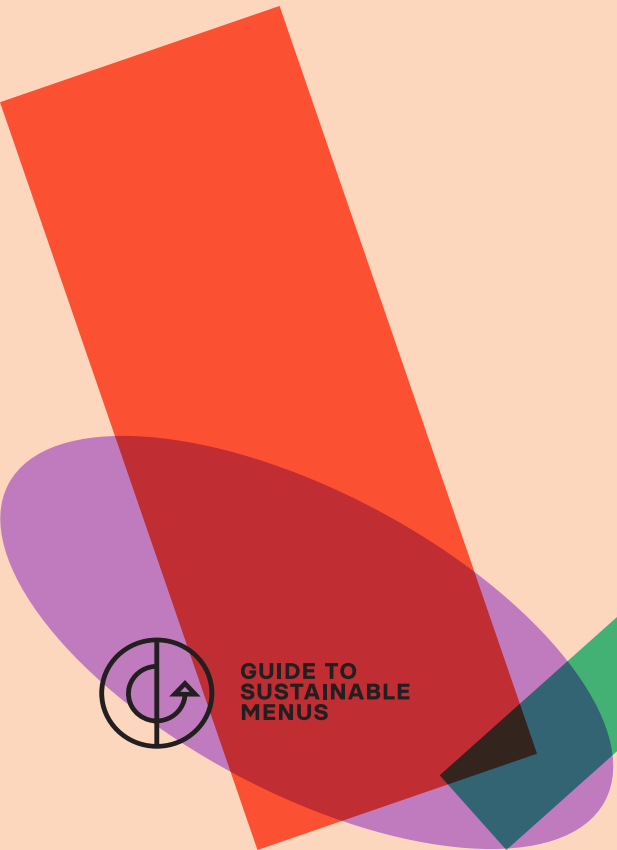
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