



nutripro[®]

NESTLÉ PROFESSIONAL NUTRITION MAGAZINE

More Plants on the Plate

A Sustainable
Way to Feed
the World

Understanding
Plant Protein

Cooking
with Plants

What's
on the

plate?

For a
growing
number of
consumers,
it's not meat.



While fruits, vegetables, and herbs have always been an important part of cooking, more and more people around the world are opting to eat only plants at some or all of their meals.

As a food service expert, it's important for you to stay on top of these rising trends. Of course, you don't have to abandon your existing menu, but by catering to both people who eat foods and beverages from animal sources and people who avoid them, you can expand your offerings to serve a wider range of consumers.

In this issue, we'll examine the main types of plant-based diets and the reasons people choose them. We'll also cover some of the unique challenges and opportunities of cooking without animal-based ingredients, along with helpful tips you can use in your establishment.

From an occasional meatless meal to a strict vegan diet, you'll know just what it takes to keep every guest satisfied.



39%

OF EUROPEAN
SHOPPERS ARE
BUYING VEGETARIAN
FOOD OPTIONS?²

IN THE US
30%

OF MILLENNIALS EAT
MEAT ALTERNATIVES
EVERY DAY,
50%
A FEW TIMES
EACH WEEK!¹

MEAT
CONSUMPTION
IS DECREASING IN

25%

OF COUNTRIES
AROUND THE
WORLD.³

**CHINA HAS
COMMITTED TO
REDUCE MEAT
CONSUMPTION**

50%
BY 2030.³

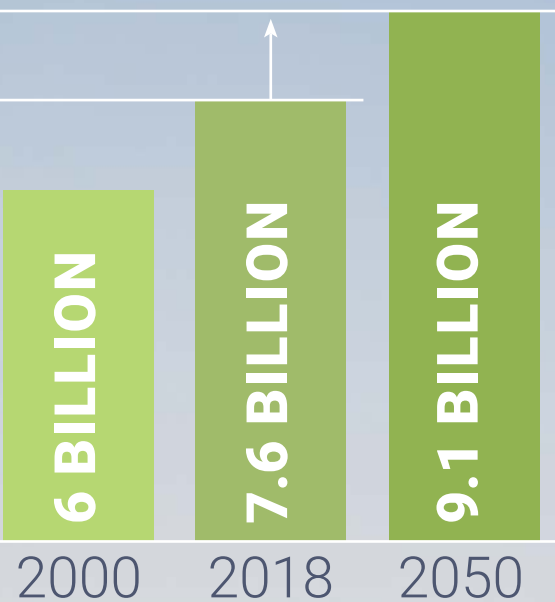
EACH
YEAR
THERE
ARE
76
MILLION
NEW VEGETARIANS
AROUND THE
WORLD.⁴

PLANTS TO FEED THE *world*⁵

POPULATION GROWTH AND URBANISATION

BY **2050** THE GLOBAL POPULATION WILL INCREASE

20%



6.4 BILLION WILL BE URBAN COMPARED TO 3.7 BILLION TODAY. CITY DWELLERS HAVE LARGER INCOMES AND EAT MORE MEAT ON AVERAGE.

OUR CURRENT FOOD SYSTEM USES⁶



AGRICULTURE

TO FEED

THIS LARGER, WEALTHIER, URBAN POPULATION, FOOD PRODUCTION NEEDS TO INCREASE BY

70%

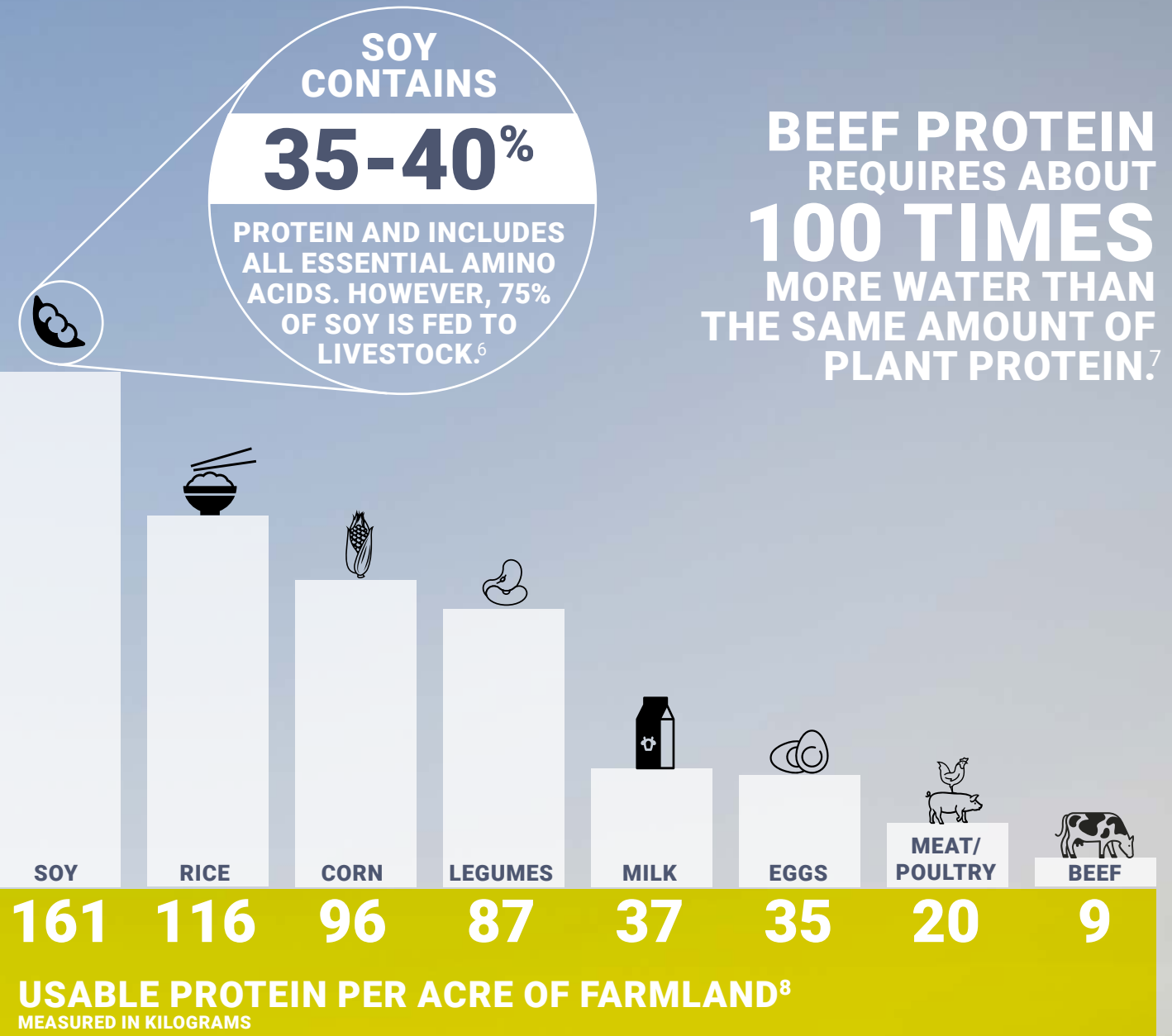
THROUGH **2050.**

THERE ARE CURRENTLY **55 BILLION** LIVESTOCK CONSUMING FOOD GROWN ON NEARLY

3/4 OF THE ARABLE LAND.

THERE IS SIMPLY **NOT ENOUGH LAND TO FEED 9 BILLION** THE CURRENT DIET.

SHIFTING TOWARD A MORE PLANT-BASED DIET



EVEN AS WE STRIVE FOR A MORE SUSTAINABLE PLANT-BASED DIET, CROP PRODUCTION STILL REQUIRES A NITROGEN SOURCE. THIS IS MOST COMMONLY PROVIDED THROUGH NITROGEN FERTILIZER WHICH REQUIRES TREMENDOUS ENERGY, AND AS A POLLUTANT, IS CONSIDERED AMONG THE TOP THREE THREATS TO GLOBAL BIODIVERSITY. MORE SUSTAINABLE FARMING METHODS LIKE CROP ROTATION WILL NEED TO BE EXPLORED.⁹

UNDERSTANDING *Plant-based Diets*

There are many different approaches to plant-based eating, from people who simply want to eat meat less often to people who consume no animal products or by-products of any kind.

A RANGE OF OPTIONS

Flexitarian: actively chooses to eat less meat, whether that means reducing the amount on the plate or avoiding meat on certain days of the week.

Vegetarian: does not eat meat of any kind, but may consume animal by-products.

Lacto-ovo vegetarian: eats dairy products and eggs, but not meat.

Ovo-vegetarian: eats eggs, but not dairy products or meat.

Lacto-vegetarian: eats dairy products, but not eggs or meat.

Vegan: does not eat meat, eggs, dairy products, or any other ingredients created from or produced by animals, including honey.

WHY PEOPLE ARE EATING MORE PLANTS

Like many lifestyle choices, there are multiple reasons people might choose to follow a plant-based diet. Understanding these reasons can help you connect with your guests and shape your menu around their preferences.

Health

Plant-based foods can be a good source of vitamins, minerals, dietary fiber, and even healthy oils and protein. Some people reduce or eliminate animal products from their diet because of dietary intolerances (like dairy), cardiovascular health, or general well-being. What's more, a study showed that after only 48 hours of consuming a vegan diet, people experienced a significant improvement in health indicators, like blood cholesterol, blood lipids and insulin.¹⁰

Affordability

Another factor for some who choose to eat less meat is cost. For example, dried beans and rice are a cost-effective alternative to high-priced meat products, and they are also a good source of protein.

Ethics

Others choose not to eat meat because of ethical reasons and their interest in animal welfare. A common consumer concern is about the uncontrolled use of antibiotics and their health implications. Many people are also concerned about the living conditions and general treatment of the animals themselves.¹¹ And some don't believe that humans have the right to kill animals for food.¹²

Religion

Several religions advise their followers to avoid eating meat or animal-based products. For example, Hindus and Buddhists have a strong tradition of vegetarianism, Jainists follow a vegan diet, and Seventh-Day Adventists promote lacto-ovo-vegetarianism.

The Environment

Still another reason that people limit meat from their diets is related to the environmental impact. With 30 percent of the earth's entire land surface covered with livestock, raising cattle generates more of the greenhouse gases responsible for global warming than transportation.¹³ It's also associated with other environmental concerns including deforestation and low scrutiny of air and water pollution on surrounding communities.¹¹

Sensory and Preference

Finally, there are some people who simply don't enjoy eating animal products due to their characteristic taste, texture, or smell.



Getting PROTEIN

WHAT IS PROTEIN?

Proteins are large molecules made up of smaller units called amino acids. Protein is present in all body cells and takes part in most biological processes. It's readily available in meat, seafood, dairy, and eggs, but vegetarians and vegans need to choose plant foods or combinations of foods that provide adequate protein.

WHY DO WE NEED IT?

Proteins provide amino acids that are used to build and maintain bones, muscles and skin, and produce enzymes, hormones, neurotransmitters, and antibodies.¹⁴ To function properly, the body needs 22 different amino-acids, and nine of them (the essential amino acids) must be obtained from food.

HOW MUCH DO WE NEED?

The daily protein recommendation for adults is 0.8 g for every kg of body weight, (about 50 grams for a 60 kg person*) and from 0.8 - 1.3 g per kg of body weight for infants and children.¹⁷ Because the body rapidly turns over protein stores, people need to consume adequate amounts of the amino acids that make up proteins in order to maintain good health.¹⁵

complementary proteins ACROSS CULTURES

You don't have to look far to find examples of foods that complement each other to provide all of the amino acids you need. All around the world, traditional dishes have found a way to satisfy people's hunger, tastes, and basic protein needs by relying on plant crops. Traditional plant-based dishes that offer a complete amino acid profile include:

Mexico: Black beans with corn and/or rice

Lebanon: Falafel and tahini-based sauce

Morocco: Couscous with chickpeas

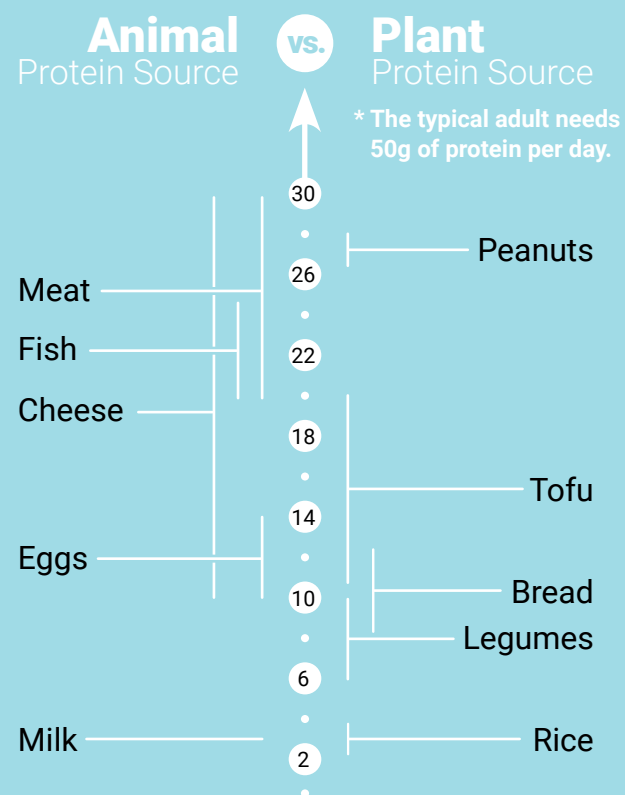
Ethiopia: Injera (flat bread made with teff flour) with wat (lentil stew)

Punjab region, North India: Kaali daal (black lentils) with rice

Switzerland: Muesli (nuts and grains)

South Africa: Samp (corn) and beans

COMPARING

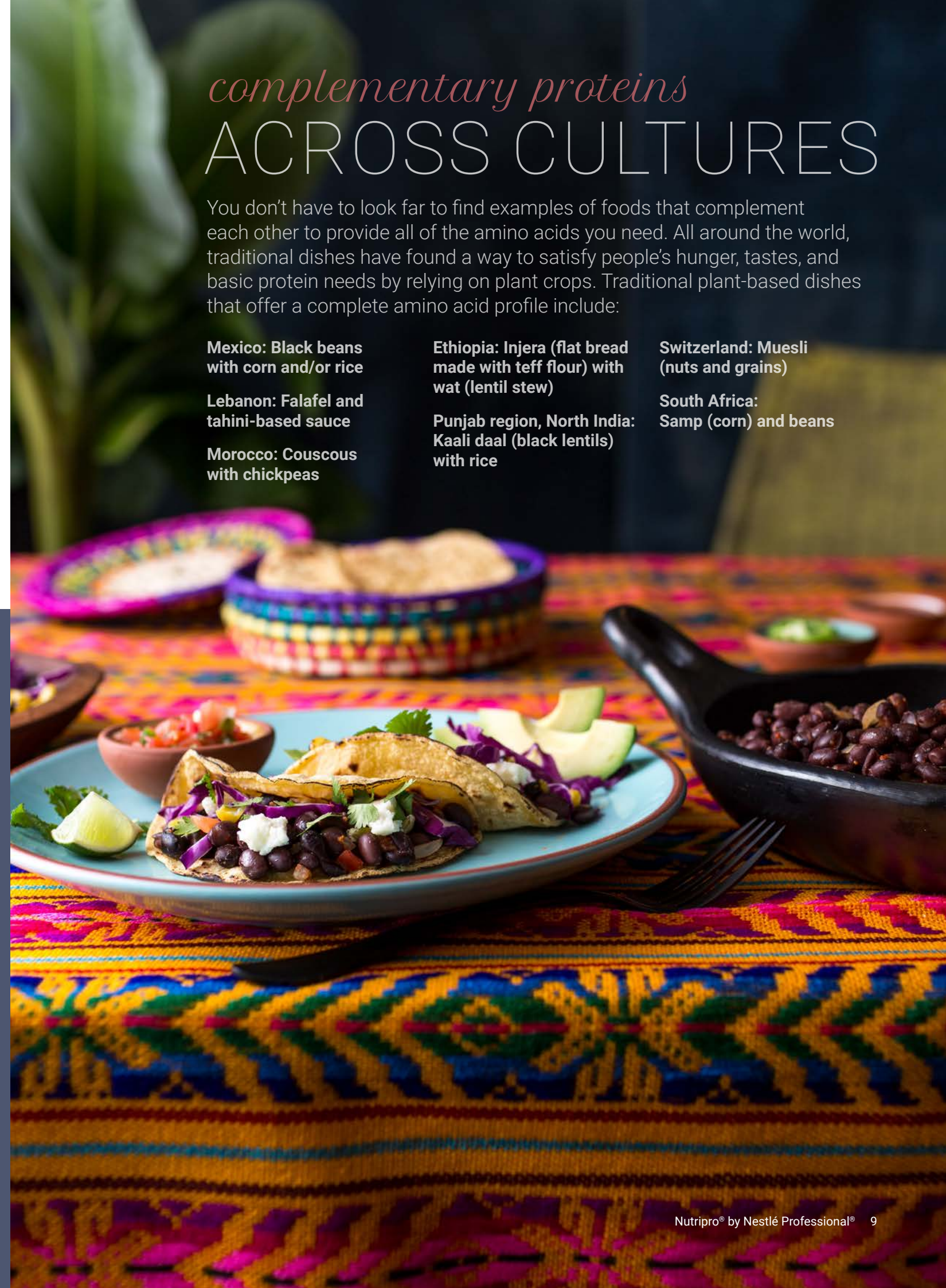


GRAMS OF PROTEIN PER 100 GRAMS OF PREPARED FOOD¹⁶

Complete your profile

Some foods contain all of the essential amino acids you need in sufficient quantities. These are known as complete protein sources. Along with meat, seafood, eggs, and dairy, you can also get complete proteins from plants such as quinoa, buckwheat, amaranth, soy, hemp, and chia seeds.

Foods that don't contain all nine essential amino-acids are known as incomplete protein sources. While they don't offer enough essential amino acids on their own, they can be combined with a variety of other foods throughout the day to provide an adequate intake of quality proteins. Examples include nuts and seeds, legumes, grains, and vegetables.¹⁷



PLANT-BASED *Beverages*

From the grocery store to the local coffee shop

Dairy alternatives are everywhere, and consumers are eager to embrace them. In fact, plant-based milks now make up 10% of the overall dairy market, while per capita consumption of milk has dropped 13% in the US and 4.1% in Europe. In Western Europe, sales of almond, coconut, rice, and oat beverages doubled from 2009-2014, while they increased three times in Australasia and nine times in North America.¹¹

In general, you can substitute any plant-based milk for dairy milk 1:1, except in recipes where the protein plays an important structural role (e.g. baked applications). You can also try combining beverages like soy or oat and pea to provide a more complete protein.

You may also want to consider the differences in flavor and nutrition. Many milk alternatives have added sugar to mask the "beany" or "cerealy" flavours. In many countries, dairy milk may also be fortified with key nutrients (like vitamins A & D), so look for options that have no (or low) added sugars and contain the same fortified nutrients as milk.

Milk vs. the Alternatives

Based on 100g of product



	Cow's 2% Milk	Soy	Pea	Oat	Coconut	Almond	Rice
Protein	3.3	3.3	3.3	1.6	1.0	.6	.3
kcal	50	37	29	52	140	15	47
Fat (g)	2	2.1	1.9	1	13	1.1	1
	Good source of complete protein and other essential nutrients. Unsuitable for those with milk allergy, and limited/avoided with lactose intolerance.	Good source of complete protein, contains soy isoflavones. Unsuitable for those with soy allergy.	Good source of protein, but does not contain all essential amino acids (incomplete).	Contains soluble fiber associated with heart-healthy benefits. May contain gluten, so those with coeliac disease/gluten intolerance should avoid.	High in calories, total fat, and saturated fat. Low and incomplete source of protein.	Low and incomplete source of protein. Contains healthy fats from nuts. Unsuitable for those with nut allergies.	Not a good source of protein, and does not contain all essential amino acids (incomplete).

DID YOU KNOW?

Grains and legumes tend to be complementary proteins. Mixing rice and pea beverages can form a complete source of protein. And soy beverage is a complete source on its own.

DID YOU KNOW?

Oat beverage is the best milk alternative for creating latte art.

the beauty of PLANTS

Herbs offer a wide variety of health benefits such as antiseptic, antioxidant, or digestive support.

Plants are more than just a source of protein—it's no wonder that they make up so much of what people eat. They're colorful, flavorful, and as shown here, full of nutrients that are important for human health.¹⁸ In fact, many countries around the world recommend eating at least five servings of fruits and vegetables per day,¹⁹ in any form including fresh, frozen, tinned, and dried.

Mushrooms are a good source of fiber, B vitamins, copper, niacin, potassium, and iron, and they have anti-inflammatory properties. They are also a good source of protein, but do not contain all essential amino acids.

Seaweed is a rich source of iodine, which is important for maintaining the function of the thyroid. It may also provide dietary fiber, and some vitamins.

Pulses are an excellent source of fiber and protein. However, they do not contain all essential amino acids (except soy, which is a complete protein).

Spices have various benefits including antimicrobial (eugenol in cloves), anti-inflammatory (curcumin in turmeric), and antioxidant (cinnamaldehyde in cinnamon) properties.

Onion is high in the antioxidant vitamin C and may reduce inflammation in arteries.

Garlic is one of the most effective antibiotics in plants, acting on bacteria, viruses, and parasites.

Leafy greens contain vitamin K, folic acid, and potassium. Just half a cup of spinach contains 17% of daily iron requirements.

Cereals and grains are a rich source of insoluble fiber, which contributes to healthy digestion. Oats and barley also contain beta-glucan, which may reduce the risk of heart disease. Quinoa is one of the grains that provides a complete protein.

Yellow and orange fruits and vegetables are typically a good source of vitamin C and beta-carotene (a form of vitamin A). Vitamin A can help to maintain healthy vision.

Cruciferous vegetables are rich in folate, vitamin K, and phytonutrients, which may help to lower inflammation and the risk of some cancers.

Blue and purple produce contains flavonoids, which may contribute to proper brain function and blood flow. Their skin is also rich in the antioxidant anthocyanin.

Red fruits and vegetables contain the antioxidant vitamin C and lycopene. Some evidence shows an association between lycopene and lower cardiovascular and cancer risks.

Nuts and seeds contain unsaturated fats (associated with a healthy cardiovascular system) along with manganese, magnesium, and fiber. They are also a good source of protein, but do not contain all essential amino acids.



KEEPING

a watchful eye

Anti-nutrition

Some plants have anti-nutritional factors that can interfere with the absorption of nutrients or can even be toxic.

Rhubarb shouldn't be consumed after June because its oxalate levels increase.

Manioc or cassava should be soaked to get rid of its cyanogen.

Potatoes should not be eaten once they've started to sprout because of elevated levels of glycoalkaloid (a toxin) and nitrates. Avoid storing them too long, and keep them in the dark to help prevent germination.

Soy Beans contain a natural toxin called a trypsin inhibitor which can stop proper digestion. The toxin is destroyed by proper cooking, so when using dried beans, soak them overnight and simmer for three hours before eating.

DID YOU KNOW?

The beta carotene in carrots and tomatoes is more bioavailable when cooked.

Hidden Animal-based Ingredients

While meat, eggs, and dairy milk are easy to identify, there are other foods where the presence of animal products is not so obvious. To respect your guests' wishes, double-check the following ingredients as requested.

Hidden Dairy Ingredients

Coffee creamer and some alternative dairy sources
May contain casein from milk

Bread and baked goods
May contain whey from milk

Protein powder
May contain whey from milk

Hidden Animal Ingredients

Gelatin, pudding, marshmallows and gummy candies
Gelatin is made with bone or hides and is a common ingredient in confections

Soups
Check label for bone broth

Breads and baked goods
Check label for L-cysteine, used as a dough conditioner derived from animal sources

Hidden Egg Ingredients

Sauces, salad dressings, meringue

Other Animal Products

Honey

Serving IT UP



Integrating more plants into your menu? Here are some ideas to expand your plant-based options.

Planning a plant-based meal

1. Select the category of your dish. Is it a roast, soup or stew, or multi-component main dish?
2. Choose your anchor vegetables. What's in season?
3. Consider how it can be prepared and choose your cooking method.
4. Plan your spices and seasonings around your choices.
5. Add balance from a nutritional perspective. Can you combine foods to provide a complete protein?
6. Enhance your plating, with complementary colors, shapes, flavors, and textures.

Add appeal to plants

Use interesting textures to intrigue the senses. Try roasting vegetables for a crispy feel, or oven-dry them to concentrate the flavours, increasing the "meaty" texture. You can also combine vegetables with raw nuts and seeds to provide varying levels of crunchiness.

Try unusual spice and flavor combinations.

This is a good way to complement or accent the flavours of the produce. For example, nutmeg is good with root vegetables such as sweet potatoes, potatoes, and pumpkins. Cumin and coriander go well with sweet vegetables like beets. And mustard complements cabbage, broccoli, sprouts, and kale. Smoking or grilling fruits and vegetables can also enhance their flavor profile.

Experiment with the form of the dish.

Just by slicing vegetables differently, you can create a different experience. Try serving a portobello mushroom as a "steak," slice cucumber or zucchini into ribbons and serve in place of pasta, or use a ricer on cooked cauliflower. You can even cook carrots and puree them into a foam or blend with pulses for hummus.

Make room on the menu

It's a good idea to integrate vegan and vegetarian dishes with the rest of the menu. This draws more attention to your plant-based recipes and avoids creating a stigma around non-meat dishes. Make sure your descriptions are just as cravable as the rest of the menu, and these dishes may become some of your guests' new favorites.

Choosing an alternative centre of plate

Putting protein on the plate drives satiety and delays digestion. If you're not using meat in your dish, there are many other interesting ways to provide bulk and quiet hunger pangs. While some of these options are also good sources of protein, others need to be combined with different foods in order to provide a complete protein.

Vegetarian meat alternatives

Close to familiar meat form and texture. May contain spices or other flavouring to simulate meat taste. Substitute wherever you would use meat.

Tofu

Comes in many forms including extra firm, firm, soft and silken. Soft, smooth and flavourless on its own, it is a prime candidate for flavourful marinades, sauces, and seasonings. Add to soups, stir-fries, and scrambles.

Tempeh

Sold in flat, rectangular pieces. Has a slightly earthy taste and chewy texture. Crumble and add to soups, salads, or pasta, or serve in a sandwich.

Seitan

Made from cooked wheat gluten, it has a chewy texture and is a good source of protein. It's commonly used in Asian dishes.

Pulses (beans and lentils)

Available dry or canned. Firm texture, may have slightly nutty flavor. Add to soups, salads, stews or casseroles, or make into "meat"balls.

Mushrooms

Porcini, shiitake, and portobello mushrooms add umami flavor and hearty texture. Can be eaten raw, cooked in salads, sauces, soups, and sandwiches, or grilled.

Jackfruit*

Choose unripe or canned in water or brine to avoid sweetness. Grill and shred like pulled pork, slice into "steaks," or add to stir-fries and salads.

Cauliflower*

Mild taste absorbs flavours easily. Chop and eat raw, slice into "steaks" and oven roast, add to curries and stir-fries, or boil and mash or put through a ricer.

Tubers*

Cost-effective, filling, and absorbs flavors readily. Boil, bake, roast, mash, or fry. Try sweet potatoes with black beans in enchiladas.

Bulbs*

Fennel and artichokes add textural interest and presence on the plate. Roast with olive oil and add to salads or dips.

Beetroot*

Roasted and caramelized, it plates nicely and adds rich color. Roast or boil and add to soups or salads.

Nuts & peanuts

Enhance food with a nutty flavor and crunch. Add to salads, pasta, desserts, etc. (Note: Nuts are food allergens. Identify on menu and check with guests before serving.)

*Not a good source of protein.

COOKING

WITHOUT ANIMAL-BASED INGREDIENTS

Milk, eggs, and other animal-based ingredients often perform functional roles in cooking, so it can be a challenge to replace them. Finding a suitable alternative depends on their role in the original recipe. While substitution is an experimental process, the following tips and tricks are a good place to start.

EGG SUBSTITUTES

Eggs may serve more than one purpose in a recipe. To choose an appropriate replacement, consider their function in your dish.

Coagulation/Gelation: A typical custard or flan recipe uses one egg to set 1 cup of full-cream milk with 2 tbsp of added sugar. To replace the egg, substitute a combination of 3-4 g (1 tsp) corn starch + 0.5 g gum. Depending on the fat content of the milk, the amount of sugar, and additional ingredients in the recipe, this might have to be adjusted. If you are also replacing the milk with a plant-based alternative, add a pinch of salt to set the gel.

Emulsification: Eggs help incorporate oil and water-based liquids together into a stable substance. To replace them in salad dressings and mayonnaise substitute 1 tsp lecithin + 0.5 g gum for one egg yolk. (Note that some lecithin is animal-based, so look for soy-based alternatives.) In sweet batters, combine thick fruit purées (like apple or banana) with the lecithin and gum to emulsify and add body to the recipe.

Foaming: The foaming ability of egg whites aerates foods to make them light and fluffy. When making mousses and terrines, replace egg whites with whippable non-dairy creams especially formulated for this purpose. In baked goods, you can replace eggs by increasing the amount of baking powder/baking soda and adding a teaspoon of vinegar/lemon juice for taste.

Color: Instead of relying on eggs for browning, use a pinch of turmeric to add a light golden touch. Be careful not to overdo it, as turmeric could also impart its flavor.

Texture: Eggs are also used for binding, or holding ingredients together. To bind savoury dishes without eggs, try adding mashed potatoes, rice flour, or wheat or corn starch to thicken the recipe. In cake batters, mashed banana, apple puree, and a pinch of gum or corn starch will give a nice thick texture to the batter. In gluten-free recipes, create a slurry of 1 tbsp flax seed dissolved in 3 tbsp water and set it aside until sticky, then use this in place of egg.

Taste: Eggs add a richness to the flavor of baked goods, desserts, sauces, and dressings. Add a teaspoon of nut, sunflower, or olive oil to compensate for every egg removed in these recipes.

MILK SUBSTITUTES

Like eggs, milk has several functions in food, so there are no universally fail-proof substitutes.

Liquids: In beverages and pourable applications (like dressings and sauces), you can typically use a 1:1 substitution with plant-based dairy alternatives, vegetable broths, fruit juices, or water, depending on the recipe.

Other dishes: In more complex recipes, milk's protein, fats, carbohydrates, salts, and minerals may affect the dish's functionality. Several plant-based dairy alternatives for milk, cream, and yogurt, each with its own formulation and functionality, are commercially available, but finding the most suitable replacement for each recipe involves trial and error. You may need to adjust the flavor by adding a pinch of salt, sugar, or a squeeze of lemon to balance sweetness, saltiness, and acidity. For baked custards, batters, and egg & milk emulsions, add 1/4 tsp salt per 1 cup of milk alternative.

GELATIN SUBSTITUTES

Bovine gelatin is used to set gels, moulded desserts, and candies, and sometimes to add a transparent coating or glaze to appetizers or fruit desserts. To replicate its setting ability, substitute the same amount of powdered agar (derived from seaweed) or carrageenan. Approximately 2 g of agar will set 250 mL of liquid. Alternatively, gums (from guar, xanthan, or locust bean) can also be used. One gram of gum will provide the same functionality as 1/2 tsp of gelatin or 1/3 tsp of agar.

HONEY SUBSTITUTES

Honey's primary function is to add sweetness or flavor to recipes. While the flavor is unique and can't be replicated by plant-based ingredients, you can substitute maple syrup, agave syrup, or brown sugar in a 1:1 ratio to provide sweetness.

Every day more of us are relying on plants for the nutrition and flavor we crave. While this shift is inevitable if we want to feed the world, it's also an exciting opportunity to expand your culinary repertoire. From grains to fruits, vegetables, herbs, and spices, the world of plant-based ingredients is full of colors, flavors, textures, and nutrients, all ripe and ready for you to satisfy your customers.

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