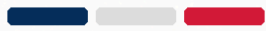


FLSDiet®

FRENCH LOW SULFUR DIET



Food list

STANDARD VERSION

Food / Amounts / Precautions

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With menus and recipes by Clara Materne, Nutritional Therapist

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FOOD LIST

Food / Amounts / Precautions

A guide to the elimination phase and food reintroduction for Standard FLSDiet®

The French Low Sulfur Diet (FLSDiet®) combines detailed information about a diet low in sulfur-containing compounds with a selection of enjoyable recipes carefully adapted to its principles. It was designed to reconcile nutritional requirements, the pleasure of eating and culinary creativity, with the distinctive gastronomic “French Touch”. It was first presented at the second Microbiome360 congress, organised by D-CODE LAB in Lyon, France, on 3 and 4 October 2026. Created by Dr Christian Boyer (PhD) and Dr Amin Gasmi (PhD). Menus and recipes by Clara Materne, nutritional therapist.

Important information

FLSDiet® (French Low Sulfur Diet) is a temporary dietary approach intended to support the management of certain digestive sensitivities or reactions associated with sulfur-containing compounds. This document is provided for educational and informational purposes. It does not constitute a diagnosis, a medical prescription or a treatment, and is not a substitute for consultation with a doctor or another qualified healthcare professional.

THE FLSDIET® KIT

FLSDiet® is available as a complete kit addressing issues associated with sulfur-containing compounds. It includes:

- Two lists of foods to favour, limit or avoid: one for the standard diet and one for the vegetarian diet;
- Two practical guides, one for patients and one for professionals, describing instructions and the course of the elimination and reintroduction phases, as well as supportive approaches to problems associated with sulfur-containing compounds. These guides apply to both Standard and Vegetarian FLSDiet®;
- A recipe booklet, also shared by the standard and vegetarian versions of FLSDiet®.

INTRODUCING STANDARD FLSDiet®

Standard FLSDiet® (French Low Sulfur Diet) is a supportive diet specifically designed for situations characterised by an overgrowth of hydrogen sulfide (H₂S)-producing bacteria, also called ISO (Intestinal Sulfide Overproduction). ISO may involve H₂S LIBO (Large Intestinal Bacterial Overgrowth), H₂S SIBO (Small Intestinal Bacterial Overgrowth), or both.

FLSDiet® involves temporarily adopting an eating pattern with two complementary aims:

- reduce microbial, and also endogenous, production of hydrogen sulfide (H₂S);
- To limit the overgrowth of intestinal bacteria that produce H₂S.

With this in mind, Standard FLSDiet® limits in particular:

- Animal products rich in sulfur-containing amino acids (cysteine and methionine) and taurine.
- starchy foods (cereals, pseudocereals and similar products), nuts and seeds rich in sulfur-containing amino acids or potentially less well tolerated;
- Saturated fats.
- Sulfur-containing compounds in plant foods, particularly the organosulfur compounds found in the Brassicaceae and Alliaceae families.
- Sulfites and sulfates.
- More generally, any foods, ingredients, dietary supplements or additives that may increase intestinal H₂S production or encourage the growth of bacteria that produce it.

Standard FLSDiet® may also be considered for people with intolerance to sulfur-containing compounds. In cases of marked intolerance or severe ISO (Intestinal Sulfide Overproduction), the vegetarian version of FLSDiet® will generally be preferred, as it allows a greater reduction in dietary sulfur-containing compounds, particularly sulfur-containing amino acids.

“Intolerance to sulfur-containing compounds” does not mean an allergy to sulfur. It refers to an imbalance between the amounts of sulfur-containing compounds supplied by food or produced by the body and its microbiota, and the host’s capacity to metabolise and eliminate them.

THE TWO PHASES OF STANDARD FLSDiet® AND THE FOOD LIST

Standard French Low Sulfur Diet has two phases. The first, the strict elimination phase, should be followed for a maximum of 2 to 3 weeks. Symptoms may improve rapidly, sometimes within the first week. The second is a reintroduction phase that may extend over 2 to 3 months when full reintroduction is planned, with the aim of returning to as varied a diet as possible.

PHASE 1 — Standard FLSDiet® elimination phase

Duration: 2–3 weeks

During this first phase, remove all foods listed under “Avoid or reintroduce later”.

The permitted foods are those listed under:

- “Foods to favour”;
- “Foods to moderate and requiring particular care”.

Where maximum amounts per meal and/or per day are specified, these limits must be observed.

Foods in the “Limit and monitor tolerance carefully” category tend to trigger more reactions in some patients, for reasons that may or may not be directly related to ISO. This classification is not a recommendation to eliminate these foods routinely. Instead, intake should be adjusted to individual tolerance.

PHASE 2 — Standard FLSDiet® reintroduction phase

Duration: 2–3 months for full reintroduction using option 1

For further information, see the FLSDiet® PRACTICAL GUIDE FOR PATIENTS OR HEALTHCARE PROFESSIONALS

Meat

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• Skinless white poultry meat: choose fresh chicken or turkey breast fillets and tenderloins, preferably free-range and/or organic. Recommended poultry intake: about 100–120 g per meal, with a maximum of 200 g per day during the first 2 weeks and 250 g per day during the 3rd week. Additional information Meat must be very fresh and eaten within 48 hours of purchase; otherwise, freeze it.	—	• Game and duck • All offal • All meat stocks and broths, including chicken, whether commercially prepared or homemade. • Dark poultry meat: chicken and turkey legs and thighs. • Beef, veal, pork and lamb, and products made from them, including cured meats, pâtés and ham.

Fish and shellfish

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
—	- Lean or moderately fatty white fish: haddock, whiting, cod, blue grenadier (hoki) fillets and halibut. - Oily fish, if tolerated: mackerel fillets, sardines, organic salmon and trout. - Sardines in oil, if tolerated: choose sardines with no added ingredients other than oil, salt and pepper. Recommended fish intake: one 150 g serving, twice a week. Additional information Fish should be as fresh as possible. Choose frozen fish, ideally labeled “frozen on board” or “frozen at sea”. Preferably poach it in court-bouillon or steam it.	- Canned fish, except sardines in olive oil. - Fish with commercially prepared sauces. - All shellfish, crustaceans and mollusks, without exception: shrimp, crab, oysters, mussels, scallops, squid, octopus, etc.

Eggs

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
—	—	• Eggs in any form, whether whole or used as an ingredient.

Plant- and animal-based protein powders

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• Pea protein (isolate only) Additional information Among plant protein powders, pea protein is preferred over rice protein, provided it is well tolerated.	• Rice protein (isolate only)	• Soy protein powder and other plant proteins, except pea and rice. • Animal-based protein supplements: egg protein, beef protein, whey or casein.

Milk and dairy products

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
—	Plant-based drinks: rice and/or coconut drinks with no added sugar and no thickeners such as guar gum (E412), xanthan gum (E415) or carrageenans (E407).	Avoid milk from any animal source (cow, goat, sheep, buffalo, etc.) and dairy products such as yogurt, skyr and cheese.

Oils and fats

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• All vegetable oils except coconut and palm oil: olive, rapeseed (canola), perilla, hemp and avocado oils are preferred, as are evening primrose and borage oils. Additional information Vary the oils you use throughout the week and favor using them uncooked. Once opened, refrigerate oils that are especially prone to oxidation, such as perilla and rapeseed oils. Store olive oil at room temperature; it can be used uncooked or for gentle cooking.	• Organic ghee (clarified butter) Additional information Ghee is permitted only in small amounts for cooking. • Sunflower and walnut oils	• Beef tallow, pork lard, duck fat and goose fat • Dairy fats: butter, except small amounts of ghee, and cream. • Palm oil • Coconut oil, cream and milk • Commercial margarines • Végétaline (solid frying fat)

Nuts and seeds

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
—	• Flaxseed: one serving of up to 10 g per day. Grind it yourself and consume immediately. Additional information Ground flaxseed oxidizes and deteriorates quickly, so it must be consumed immediately. • Macadamia nuts only: one small handful, equivalent to 20 g per day.	• All other oilseeds and nuts, except macadamia nuts and ground flaxseed.

Starchy foods including cereals, tubers and similar foods — Flours and starches

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• White rice, preferably Thai rice • White rice pasta and vermicelli Recommended rice intake: one serving of rice, rice pasta or vermicelli = 100–120 g cooked. Maximum: 2 servings per day. Additional information Rinse rice in cold water, then cook it in plenty of water. To reduce arsenic exposure, the PBA (Parboiled and Absorbed) method is recommended: parboil the rice for 5 minutes, discard that water, then finish cooking it in fresh water. • Fresh potatoes that have not been stored for a long time. Additional information Do not eat potatoes that have turned green or sprouted. Peel potatoes before cooking and cook them only in water.	• White rice flour, tapioca starch, arrowroot and potato starch. • Sweet potato: no more than one 120–150 g serving per week. Additional information Preferably boil sweet potato in pieces, then mash it with a fork.	• Wholegrain and partially wholegrain rice, pasta and vermicelli. • Chestnuts and all chestnut products, including flour. • All other tubers: cassava, yam, Jerusalem artichoke, etc. • All other cereals and pseudocereals: wheat, barley, spelt, einkorn, corn, oats, quinoa, buckwheat, teff, sorghum, millet, etc. • All flours and starches except white rice flour, tapioca starch and arrowroot.

Legumes

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
—	—	• Lupin • Split peas • Chickpeas • Soy in any form: soy protein powder, textured soy protein, tofu and tempeh. • All dried beans and lentils

Vegetables and root vegetables

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
Fresh and frozen vegetables: • Carrots • Celeriac and celery • Cucumber • Squashes: butternut squash, spaghetti squash, pumpkin, red kuri squash... • Courgettes • Endives • Fennel • Green beans • Lettuce: Batavia, oak leaf and romaine (no watercress, lamb's lettuce or rocket) • Parsnips • Bamboo shoots (canned) Additional information Celeriac and celery should be cooked in boiling water.	Fresh and frozen vegetables: • Aubergine • Button and Portobello mushrooms (very fresh or frozen) • Peppers • Tomates	• Garlic, onions and shallots • Garlic-infused oils Fresh and frozen vegetables: • Artichokes • Asparagus • Beetroot • Chard • Sauerkraut and kimchi (fermented cabbage) • Spinach • Jicama (Mexican yam bean) • Peas • Dandelion greens • Leeks • All canned vegetables except bamboo shoots. • All mushrooms except button and portobello mushrooms. • All cruciferous vegetables and their sprouts: broccoli, cauliflower, green and red cabbage, Brussels sprouts, kale, Chinese cabbage, turnips, rutabaga, radishes, black radish, arugula, watercress, mustard, horseradish, wasabi, etc.

Fruit

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
Fresh or frozen fruit: • Apricots • Berries: blackberries, blueberries and raspberries • Cherries • Fresh figs • Pomegranate • Persimmon • Mango (preferably frozen) • Melons • Watermelon • Peaches and nectarines • Pears • Apples • Plums • Grapes	Fresh or frozen fruit: • Citrus fruit: grapefruit, oranges, mandarins, clementines, lemons and limes (freshly squeezed juice only; no bottled juice) • Avocado (½ avocado per day) • Bananas that are not overripe • Kiwi fruit (2–3 per week)	• Tropical fruit such as pineapple, papaya, passion fruit and lychees. • Strawberries • Pre-cut packaged fruit, with or without juice, and canned fruit. • All dried and candied fruit, which often contains sulfites. • All fruit juices except freshly squeezed lemon juice.

Spices, herbs, condiments and sweeteners / sweet products

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
All herbs, spices and condiments not listed under “Avoid or reintroduce later”. Examples: • Salt, basil, cardamom, caraway, lemongrass, cloves, cumin (seeds and powder), preferably fresh ginger, bay leaf, oregano... • Vanilla extract, vanilla powder, vanilla pods, cinnamon and natural flavorings (with no additives or other ingredients except an oil carrier), etc. • Baking soda (instead of baking powder)	• Dill, in small amounts • Tomato paste and canned diced tomatoes, in small amounts. • Turmeric and curry: a small pinch for flavor only. • Galangal: a small pinch • Pepper, in moderation • Thyme, lemon thyme and rosemary: only small amounts to flavor food; do not use in herbal teas. • Homemade ketchup only [see recipe] • Citrus zest (organic or untreated): lemon, yuzu and orange. • Filtered apple cider vinegar with no sulfites. • Baking powder with no sulfate additives, such as sodium sulfate. Additional information Food-grade baking soda is preferred over baking powder. • Honey: choose set or crystallized honey rather than liquid honey. • Maple syrup • Fruit preserves made only with permitted fruit: choose 100% fruit, with no added sugar. Pectin is the only permitted gelling agent. Additional information Strictly limit honey, fruit preserves and maple syrup.	• Seaweed in any form • Herbs: parsley, chives, spring onions, wild garlic, cilantro (coriander leaves) and curry leaves. • Mustard, mayonnaise, ketchup and miso • Black and green olives (olive oil is exempt). • Paprika and chili peppers • Parsley-and-garlic mixtures, and freeze-dried or powdered garlic and onion. Additional information Be careful with ready-made spice blends, such as couscous seasoning or roast chicken seasoning. • All commercial stock cubes and powdered stocks. • All commercially prepared sauces, including sweet-and-sour and chili sauces. • All fermented sauces: soy sauce, fish sauce (nuoc mam), • Tamarind, Worcestershire sauce • Yeast and yeast extracts • Gelatin and binders other than cornstarch and arrowroot. • Balsamic vinegar and all vinegars with added sulfites. • Candy and chewing gum, with or without sugar, containing polyols or sweeteners. • Chocolate and cocoa • White sugar, cane sugar and molasses

Food additives to avoid

Code	Additive
E220	Sulfur dioxide
E221	Sodium sulfite
E222	Sodium bisulfite / sodium hydrogen sulfite
E223	Sodium metabisulfite
E224	Potassium metabisulfite
E226	Calcium sulfite
E227	Calcium bisulfite / calcium hydrogen sulfite
E228	Potassium bisulfite / potassium hydrogen sulfite
E514	Sodium sulfates
E515	Potassium sulfates
E516	Calcium sulfate
E517	Ammonium sulfate
E520	Aluminium sulfate
E521	Aluminium sodium sulfate
E522	Aluminium potassium sulfate
E523	Aluminium ammonium sulfate
E407(a)	Carrageenans
E150b	Caustic sulfite caramel
E150d	Sulfite ammonia caramel
E920	L-cysteine
E921	L-cystine

As a general rule, avoid artificial colorings and sweeteners such as acesulfame K, cyclamic acid and cyclamates, saccharin and its salts, aspartame and sucralose.

Drinks

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• Still mineral or spring waters low in sulfate [See Appendix 1 for bottled waters low in sulfate] • Tap water, only if its sulfate content is < 100 mg/L. Additional information If your tap water contains more than 100 mg/L of sulfates, choose a mineral water low in sulfates instead. • Rooibos • Herbal teas, except thyme, rosemary and, more generally, herbs with choleretic or cholagogue effects, such as dandelion, milk thistle and artichoke. • Chamomile tea	—	• Mineral or spring water high in sulfates (> 50 mg/L), and all sparkling waters • All alcoholic drinks, including alcohol-free beers and spirits • Coffee, tea, yerba mate and hot chocolate • Fruit juices and soft drinks, including sugar-free versions.

Supplements

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
Non-exhaustive list of supplements of potential interest and/or compatible with hydrogen sulfide-associated dysbiosis: • BCAAs (branched-chain amino acids: valine, leucine and isoleucine), without additives • Butyrate Certain polyphenols: • alcohol-free pomegranate extracts or tinctures, resveratrol, apigenin • <i>Codonopsis pilosula</i> (Dand Shen, also known as “poor man’s ginseng”): extracts standardized for polysaccharide content. • Coenzyme Q10 (ubiquinone) • Evening primrose and borage oils • Fish or algal oils rich in omega-3 fatty acids Additional information Choose high-quality products, for example fish oils bearing the EPAX label. • Inulin (agave inulin only) • Jiaogulan: polysaccharides and extracts with a high standardized gypenoside content. • Oregano essential oil • PEA (palmitoylethanolamide) • Riboflavin (B2) • Hydroxocobalamin (B12) • Molybdenum	Non-exhaustive list of supplements of potential interest and/or compatible with hydrogen sulfide-associated dysbiosis, but requiring precautions, particularly because of individual tolerance: • Bismuth (preferably citrate, subnitrate or subsalicylate) • GOS (galacto-oligosaccharides, e.g. Bimuno) • Bovine serum immunoglobulins and IgY (Hyperimmune Egg Powder) • Lactoferrin Probiotics: • Bifidobacterium longum BB536 • Lactobacillus plantarum P8 (LP8) • UDCA (ursodeoxycholic acid)	Non-exhaustive list of supplements to strictly avoid during the low-sulfur diet: • Magnesium acetyl taurate • Allicin and garlic extracts • Berberine in any form, including berberine HCl and berberine sulfate. • High-dose biotin (B8) • High-dose thiamine (B1), particularly allithiamine (TTFD) and benfotiamine. • Chlorella, spirulina and wild garlic • Collagen and hydrolyzed collagen supplements • “Detox” and “liver support” supplements • DMSO, alpha-lipoic acid (ALA), glutathione • EAAs (essential amino acids; contain methionine) • Bromelain and papain, often included in digestive enzyme supplements. • Broccoli extract (sulforaphane and glucoraphanin), DIM and I3C. • Glucosamine and chondroitin sulfate • Glutamine • Glycine, betaine (TMG), betaine citrate, betaine HCl, S-adenosylmethionine (SAMe), choline and phosphatidylcholine. • L-cysteine, cystine, L-methionine and taurine • Brewer’s yeast • Maca and moringa

Supplements

Foods to favor	Foods to limit requiring particular care	Foods to avoid or reintroduce later
• Selenium (except selenium-enriched yeast and seleno-L-methionine) • Zinc (except in sulfate form) • Magnesium sulfate (Epsom salt), for cutaneous use only Additional information Most vitamins and minerals are permitted, except for certain forms listed under “Avoid or reintroduce later”, and all forms of vitamins B1 and B8, particularly at high doses. • DAO (diamine oxidase) supplement • Digestive enzyme supplements without bromelain or papain.		• Methylfolate (methylated B9), methylcobalamin (methylated B12) • NAC (N-acetylcysteine), as a supplement or an ingredient in some cough medicines • Choleretic and cholagogue herbs: fumitory, black radish, artichoke, boldo, desmodium, etc. • Turmeric and curcumin supplements • Bile supplements: ox bile and TUDCA • H₂S-producing probiotics [see Appendix 2: probiotic bacteria that may produce H₂S] • Seleno-L-methionine and selenium-enriched yeast • Sulfate mineral salts: magnesium sulfate (Epsom salt), zinc sulfate, manganese sulfate, etc. Additional information Epsom salt is excluded only for oral use; topical use is permitted.

Appendices

Appendix 1 – Bottled waters low in sulfates

- France: Volvic (9 mg/L), Evian (15 mg/L), Thonon (12 mg/L), Wattwiller (34 mg/L), Cristaline (47 mg/L)
- United States: Poland Spring, Iceland Glacial, Fiji water, Aquafina 5 (purified water)
- Spain: Bezoya, Mondariz, Castrovita, Aquarel, Solán de Cabras

Appendix 2 — Probiotic bacteria that may produce H₂S

This non-exhaustive list includes probiotic bacteria shown experimentally to produce hydrogen sulfide (H₂S) in vitro, particularly when cysteine and/or methionine are present as sulfur-containing substrates. Names in parentheses follow the revised nomenclature published in 2020.

- *Lactobacillus plantarum* 299V (*Lactiplantibacillus plantarum* 299V)
- *Lactobacillus rhamnosus* GG (*Lacticaseibacillus rhamnosus* GG) *
- *Lactobacillus reuteri* BR11 (*Limosilactobacillus reuteri* BR11)
- *Lactobacillus delbrueckii* ATCC4797
- *Bacillus subtilis*?

References: Sreekumar R. et al., 2009; Tyulenev A. et al., 2024.

* Although *L. rhamnosus* GG is classified among probiotics that may produce H₂S in vitro, it is generally well tolerated by people with ISO. Some animal studies (*L. rhamnosus* GG alone or co-administered with *Bifidobacterium animalis* subsp. *lactis* BB12) and human studies (co-administered with a prebiotic fibre) have found a reduction in H₂S-producing bacteria in the microbiota, such as *Bilophila wadsworthia* and *Desulfovibrio* spp.

References: Ni Y. et al., 2017; Lin YC. et al., 2022; Costabile A. et al., 2017.