100 or E100: Curcumin (Turmeric Yellow) – Natural yellow-orange dye from turmeric. Safe (EFSA, FDA-approved). No known toxicity at food-grade levels.

101 or E101: Riboflavin (Vitamin B?) – Yellow color; found in milk, eggs. Safe, even at high doses (excess excreted in urine).

102 or E102: Tartrazine – Synthetic lemon-yellow dye. Controversial: Linked to hyperactivity in children (EU requires warning labels). Banned in Norway.

104 or E104: Quinoline Yellow – Synthetic greenish-yellow dye. Restricted in EU/US; potential ADHD risk. Banned in Australia.

110 or E110: Sunset Yellow FCF – Orange dye. Moderate risk: May cause allergies/hyperactivity. Banned in Finland.

120 or E120: Cochineal/Carmine – Red dye from insects. Safe but allergenic (anaphylaxis risk in sensitive individuals). Vegan-unfriendly.

122 or E122: Azorubine (Carmoisine) – Synthetic red. Restricted: Hyperactivity concerns (EU warning label). Banned in Japan.

123 or E123: Amaranth – Dark red dye. Banned in the US (suspected carcinogen); restricted in EU.

124 or E124: Ponceau 4R – Synthetic red. Controversial: Potential carcinogen (banned in US/Norway). EU

allows with limits.

127 or E127: Erythrosine – Pink/red dye. Risk: Iodine release may affect thyroid function. Restricted in EU.

129 or E129: Allura Red AC – Synthetic red. Hyperactivity risk (EU warning). Banned in Switzerland.

131 or E131: Patent Blue V – Synthetic blue. Banned in Australia/US; linked to allergic reactions.

132 or E132: Indigotine (Indigo Carmine) – Blue dye. Safe in small doses; rare allergies reported.

133 or E133: Brilliant Blue FCF – Synthetic blue. Generally safe (EFSA-approved); possible hyperactivity in kids.

140 or E140: Chlorophylls – Natural green from plants. Safe; no known toxicity.

141 or E141: Copper Chlorophyllin – Semi-synthetic green. Safe but limited intake (copper excess risk).

142 or E142: Green S – Synthetic green. Banned in Canada/Norway; suspected carcinogen.

E150a-d: Caramel Color – Brown (from sugar). E150c/d may contain 4-MEI (potential carcinogen); regulated in CA/EU.

151 or E151: Brilliant Black BN – Synthetic black. Restricted; banned in US/Canada.

153 or E153: Vegetable Carbon – Black from burnt plants. Safe (EFSA-approved).

154 or E154: Brown FK – Synthetic brown. Banned in US/EU (liver/kidney toxicity concerns).

155 or E155: Brown HT – Synthetic brown. Hyperactivity risk (EU warning); banned in US.

E160a: Beta-Carotene – Orange (natural/synthetic). Safe (converts to Vitamin A).

E160c: Paprika Extract – Red-orange. Safe; may cause mild allergies.

E160d: Lycopene – Red (tomatoes). Safe; antioxidant properties.

E161b: Lutein – Yellow (marigolds). Safe; supports eye health.

162 or E162: Beetroot Red – Natural red. Safe; no known risks.

163 or E163: Anthocyanins – Purple/blue (berries). Safe; antioxidant benefits.

171 or E171: Titanium Dioxide – White. Banned in EU (2022) for potential DNA damage (still allowed in US).

172 or E172: Iron Oxides – Red/yellow/black. Safe; used in cosmetics/foods.

173 or E173: Aluminium – Metallic silver. Banned in EU/AUS (neurotoxicity concerns).

174 or E174: Silver – Metallic. Restricted (EU allows only for decoration).

175 or E175: Gold – Metallic. Safe but expensive; inert in body.

180 or E180: Lithol Rubine BK – Red. Banned in most countries (liver toxicity).

200 or E200: Sorbic Acid – Natural/mold inhibitor. Safe (EFSA/FDA-approved); may cause mild allergies in sensitive individuals.

202 or E202: Potassium Sorbate – Prevents mold in cheese/wine. Safe; non-toxic at food doses.

203 or E203: Calcium Sorbate – Cheese/yogurt preservative. Safe; breaks down into sorbic acid.

210 or E210: Benzoic Acid – Found naturally in berries. Moderate risk: Can form benzene (carcinogen) with vitamin C. Banned in infant foods (EU).

211 or E211: Sodium Benzoate – Common in soft drinks. Controversial: Linked to hyperactivity (EU warning) and potential DNA damage (in combo with E102).

212 or E212: Potassium Benzoate – Similar to E211. Same risks as E211; banned in some EU infant products.

213 or E213: Calcium Benzoate – Rarely used; same concerns as E210–E212.

214 or E214: Ethylparaben – Antimicrobial. Banned in EU foods (endocrine disruptor; allowed in cosmetics).

215 or E215: Sodium Ethyl Para-hydroxybenzoate – Banned in EU (hormonal effects).

218 or E218: Methylparaben – Preservative. Banned in EU foods (estrogenic activity; cosmetic use restricted).

219 or E219: Sodium Methyl Para-hydroxybenzoate – Banned in EU (similar to E218).

220 or E220: Sulfur Dioxide – Wine/dried fruit preservative. High risk: Asthma attacks, throat irritation. EU mandates warning labels (>10 mg/kg).

221 or E221: Sodium Sulfite – Similar to E220. Same risks; banned in fresh meats (US).

222 or E222: Sodium Bisulfite – Avoid in asthma sufferers (allergy risk).

223 or E223: Sodium Metabisulfite – Same as E220–E222; degrades vitamin B1.

224 or E224: Potassium Metabisulfite – Beer/wine preservative. Restricted (EU limits).

226 or E226: Calcium Sulfite – Banned in fresh foods (US); sulfite sensitivity risk.

227 or E227: Calcium Hydrogen Sulfite – Similar to E226. Avoid in sulfite-sensitive individuals.

228 or E228: Potassium Hydrogen Sulfite – Same risks as E220.

234 or E234: Nisin – Natural antibiotic (cheese). Safe (EFSA-approved); no human toxicity.

235 or E235: Natamycin – Anti-fungal (cheese rind). Safe; non-absorbed by gut.

239 or E239: Hexamethylene Tetramine – Fish preservative. Banned in EU (forms formaldehyde).

242 or E242: Dimethyl Dicarbonate – Beverage sterilant. Safe after decomposition (forms CO?/methanol).

249 or E249: Potassium Nitrite – Cured meats. High risk: Forms nitrosamines (carcinogens); EU limits to 150 mg/kg.

250 or E250: Sodium Nitrite – Bacon/ham preservative. Controversial: Prevents botulism but linked to colon cancer (IARC Group 2A).

251 or E251: Sodium Nitrate – Similar to E250. Converts to nitrite in body; same risks.

252 or E252: Potassium Nitrate – Salt substitute. Restricted (same nitrosamine risks as E250).

280 or E280: Propionic Acid – Bread preservative. Safe; naturally occurs in Swiss cheese.

300 or E300: Ascorbic Acid (Vitamin C) – Natural antioxidant. Safe (EFSA/FDA-approved); no upper limit set.

301 or E301: Sodium Ascorbate – Vitamin C derivative. Safe; may lower blood pressure slightly.

302 or E302: Calcium Ascorbate – Buffered vitamin C. Safe; gentle on stomach.

304 or E304: Fatty Acid Esters of Ascorbic Acid – Fat-soluble vitamin C. Safe (EFSA 2015).

306 or E306: Tocopherol-Rich Extract (Vitamin E) – Natural antioxidant. Safe; no toxicity at food doses.

307 or E307: Alpha-Tocopherol (Synthetic Vitamin E) – Safe but less bioavailable than natural form.

308 or E308: Gamma-Tocopherol – Vitamin E variant. Safe; may have anti-inflammatory benefits.

309 or E309: Delta-Tocopherol – Safe; used in processed foods.

310 or E310: Propyl Gallate – Synthetic antioxidant. Controversial: Potential endocrine disruptor (EU restricts to 200 mg/kg).

311 or E311: Octyl Gallate – Similar to E310. Moderate risk: Limited absorption data.

312 or E312: Dodecyl Gallate – Banned in infant foods (EU); potential liver effects.

315 or E315: Erythorbic Acid – Antioxidant in cured meats. Safe (EFSA 2016).

316 or E316: Sodium Erythorbate – Safe; converts nitrites to nitric oxide.

319 or E319: tert-Butylhydroquinone (TBHQ) – Preserves oils. Moderate risk: Liver enlargement at high doses (FDA limit: 0.02% of oil).

320 or E320: Butylated Hydroxyanisole (BHA) – Controversial: IARC classifies as "possibly carcinogenic" (Group 2B); EU restricts to 200 mg/kg.

321 or E321: Butylated Hydroxytoluene (BHT) – Similar to E320. Moderate risk: Thyroid/liver effects in rodents (EFSA 2012).

322 or E322: Lecithin – Emulsifier from soy/eggs. Safe; may lower cholesterol.

325 or E325: Sodium Lactate – Acidity regulator. Safe; derived from fermented sugars.

326 or E326: Potassium Lactate – Safe; extends shelf life of meats.

327 or E327: Calcium Lactate – Safe; calcium supplement.

330 or E330: Citric Acid – Natural in citrus fruits. Safe; no toxicity concerns.

331 or E331: Sodium Citrate – Safe; regulates acidity in beverages.

332 or E332: Potassium Citrate – Safe; used in low-sodium products.

333 or E333: Calcium Citrate – Safe; antacid/calcium fortifier.

334 or E334: Tartaric Acid – Grapes/bananas. Safe; may cause diarrhea in excess.

335 or E335: Sodium Tartrate – Safe; mild laxative at high doses.

336 or E336: Potassium Tartrate – Safe; similar to E334.

337 or E337: Sodium Potassium Tartrate – Safe; stabilizes emulsions.

338 or E338: Phosphoric Acid – Cola drinks. Moderate risk: Linked to lower bone density (NIH 2006).

339 or E339: Sodium Phosphates – Safe in moderation; excess may imbalance calcium.

340 or E340: Potassium Phosphates – Safe; electrolyte source.

341 or E341: Calcium Phosphates – Safe; bone health support.

350 or E350: Sodium Malate – Apple-derived. Safe; no adverse effects.

351 or E351: Potassium Malate – Safe; improves mineral absorption.

352 or E352: Calcium Malate – Safe; enhances calcium uptake.

385 or E385: Calcium Disodium EDTA – Preserves color in canned foods. Safe (FDA-approved); binds heavy metals.

400 or E400: Alginic Acid – Natural thickener from seaweed. Safe (EFSA/FDA-approved); no known toxicity.

401 or E401: Sodium Alginate – Safe; used in gels and dairy products.

402 or E402: Potassium Alginate – Safe; similar to E401.

403 or E403: Ammonium Alginate – Safe; limited use due to ammonia content.

404 or E404: Calcium Alginate – Safe; improves texture in foods.

405 or E405: Propylene Glycol Alginate – Safe; stabilizer in dressings.

406 or E406: Agar – Natural gelling agent from seaweed. Safe; no adverse effects.

407 or E407: Carrageenan – Seaweed extract. Controversial: Degraded form (poligeenan) may cause inflammation (EFSA restricts molecular weight).

410 or E410: Locust Bean Gum – Natural thickener. Safe; no toxicity concerns.

412 or E412: Guar Gum – Safe; may cause bloating in excess.

413 or E413: Tragacanth – Safe; rare allergen.

414 or E414: Gum Arabic – Safe; prebiotic benefits.

415 or E415: Xanthan Gum – Safe; fermented from sugar.

416 or E416: Karaya Gum – Safe; may cause mild allergies.

417 or E417: Tara Gum – Safe; similar to E410/E412.

418 or E418: Gellan Gum – Safe; used in vegan products.

420 or E420: Sorbitol – Sweetener/thickener. Safe; laxative in high doses (>50g/day).

421 or E421: Mannitol – Safe; may cause diarrhea in excess.

422 or E422: Glycerol – Safe; humectant in baked goods.

425 or E425: Konjac Gum – Safe; EFSA-approved (may expand in throat—avoid in jelly candies).

431 or E431: Polyoxyethylene Stearate – Banned in EU (potential kidney toxicity).

432 or E432: Polysorbate 20 – Emulsifier. Safe (EFSA 2015); may contain trace ethylene oxide.

433 or E433: Polysorbate 80 – Moderate risk: Linked to gut inflammation in animal studies (FDA-approved).

434 or E434: Polysorbate 40 – Safe; similar to E432.

435 or E435: Polyoxyethylene Sorbitan Monostearate – Safe; used in ice cream.

436 or E436: Polysorbate 60 – Safe; stabilizes whipped cream.

440 or E440: Pectin – Fruit-derived gelling agent. Safe; supports gut health.

442 or E442: Ammonium Phosphatides – Safe; cocoa butter substitute.

444 or E444: Sucrose Acetate Isobutyrate – Safe; emulsifier in beverages.

445 or E445: Glycerol Esters of Wood Rosin – Safe; stabilizes citrus oils.

450 or E450: Diphosphates – Moderate risk: Excess may imbalance calcium/phosphorus (EU limits).

451 or E451: Triphosphates – Same as E450; used in processed meats.

452 or E452: Polyphosphates – Safe in moderation; may affect kidney function long-term.

459 or E459: Beta-cyclodextrin – Safe; improves solubility of flavors.

460 or E460: Cellulose – Safe; insoluble fiber.

461 or E461: Methylcellulose – Safe; vegan gelatin substitute.

463 or E463: Hydroxypropyl Cellulose – Safe; thickener in supplements.

464 or E464: Hydroxypropyl Methylcellulose – Safe; EFSA-approved.

465 or E465: Ethyl Methylcellulose – Safe; rare allergies reported.

466 or E466: Carboxymethylcellulose (CMC) – Controversial: May disrupt gut microbiota (FDA-approved).

468 or E468: Crosslinked Sodium Carboxymethylcellulose – Safe; modified CMC.

469 or E469: Enzymatically Hydrolyzed CMC – Safe; better solubility.

E470a: Sodium/Potassium/Calcium Salts of Fatty Acids – Safe; anti-caking agent.

E470b: Magnesium Salts of Fatty Acids – Safe; similar to E470a.

471 or E471: Mono- and Diglycerides of Fatty Acids – Safe; derived from plant/animal fats.

E472c: Citric Acid Esters of Mono/Diglycerides – Safe; improves dough.

473 or E473: Sucrose Esters of Fatty Acids – Safe; EFSA-approved.

474 or E474: Sucroglycerides – Safe; emulsifier in baked goods.

475 or E475: Polyglycerol Esters of Fatty Acids – Safe; vegan alternative to E471.

476 or E476: Polyglycerol Polyricinoleate – Safe; used in chocolate.

477 or E477: Propylene Glycol Esters of Fatty Acids – Moderate risk: EFSA sets ADI at 25 mg/kg/day.

E479b: Thermally Oxidized Soybean Oil – Banned in EU (potential genotoxicity).

481 or E481: Sodium Stearoyl Lactylate – Safe; dough conditioner.

482 or E482: Calcium Stearoyl Lactylate – Safe; similar to E481.

483 or E483: Stearyl Tartrate – Safe; rare use.

491 or E491: Sorbitan Monostearate – Safe; emulsifier in cakes.

500 or E500: Sodium carbonates (i) Sodium carbonate (ii) Sodium bicarbonate (baking soda) (iii) Sodium sesquicarbonate – Used as acidity regulators, leavening agents, and anti-caking agents. Generally

recognized as safe (GRAS) by the FDA. Excessive intake may cause alkalosis or electrolyte imbalance.

501 or E501: Potassium carbonates (i) Potassium carbonate (ii) Potassium bicarbonate – Used as acidity regulators and stabilizers. Safe in moderate amounts but high doses may cause gastrointestinal irritation.

503 or E503: Ammonium carbonates (i) Ammonium carbonate (ii) Ammonium bicarbonate – Leavening agents in baked goods. Safe in small amounts but may release ammonia, which can irritate respiratory passages in high concentrations.

504 or E504: Magnesium carbonates (i) Magnesium carbonate (ii) Magnesium hydroxide carbonate – Anti-caking agents and acidity regulators. Considered safe, but excessive intake may have a laxative effect.

507 or E507: Hydrochloric acid – Used for pH adjustment in food processing. Highly corrosive in pure form but safe in diluted amounts in food.

508 or E508: Potassium chloride – Salt substitute and thickening agent. Safe for most people, but excessive intake may be harmful to those with kidney disease.

509 or E509: Calcium chloride – Firming agent and preservative. Safe in food but high doses may cause gastrointestinal discomfort.

510 or E510: Ammonium chloride – Used in bread dough and licorice. Safe in small amounts, but excessive intake may cause nausea or acidosis.

511 or E511: Magnesium chloride – Firming agent and coagulant in tofu. Safe for consumption, but high doses may have a laxative effect.

512 or E512: Stannous chloride (Tin(II) chloride) – Antioxidant and color retention agent. Rarely used; tin compounds in excess may cause nausea.

513 or E513: Sulfuric acid – pH adjuster in food production. Highly corrosive but safe in trace amounts. Not permitted in some countries.

514 or E514: Sodium sulfates (i) Sodium sulfate (ii) Sodium bisulfate – Acidity regulators. Safe in small amounts but may act as a laxative in excess.

515 or E515: Potassium sulfates (i) Potassium sulfate (ii) Potassium bisulfate – Used in brewing and as acidity regulators. Generally safe in food-grade amounts.

516 or E516: Calcium sulfate (Gypsum) – Firming agent and dough conditioner. Considered safe and also used in tofu production.

517 or E517: Ammonium sulfate – Dough conditioner and nitrogen source for yeast. Safe in small amounts but not widely used in food.

518 or E518: Magnesium sulfate (Epsom salt) – Firming agent and brewing salt. Safe in moderation but can have a laxative effect in high doses.

519 or E519: Copper(II) sulfate – Color fixative (rarely used in food). Toxic in large amounts; restricted in many countries.

520 or E520: Aluminum sulfate – Firming agent. Limited use due to potential aluminum toxicity concerns (linked to neurological issues in high exposure).

521 or E521: Aluminum sodium sulfate – Used in pickling and baking powder. Similar concerns as E520 regarding aluminum exposure.

522 or E522: Aluminum potassium sulfate (Potash alum) – Acidity regulator and firming agent. Aluminum-related concerns apply.

523 or E523: Aluminum ammonium sulfate – Similar to E520–E522; potential aluminum toxicity concerns.

524 or E524: Sodium hydroxide (Lye) – pH regulator in foods like pretzels and olives. Highly caustic in pure form but safe in food processing.

525 or E525: Potassium hydroxide – Similar to E524; used in cocoa and chocolate processing. Safe in regulated amounts.

526 or E526: Calcium hydroxide (Slaked lime) – Used in pickling and corn processing. Safe in food-grade quantities.

527 or E527: Ammonium hydroxide – pH adjuster in caramel and baked goods. Safe in small amounts but can be irritating in high concentrations.

528 or E528: Magnesium hydroxide (Milk of magnesia) – Anti-caking agent and acidity regulator. Safe but may have laxative effects.

529 or E529: Calcium oxide (Quicklime) – Used in sugar production. Safe in food processing but caustic in pure form.

530 or E530: Magnesium oxide – Anti-caking agent and mineral supplement. Safe in moderation.

535 or E535: Sodium ferrocyanide – Anti-caking agent in salt. Low toxicity but restricted in some countries due to cyanide content (though tightly regulated).

536 or E536: Potassium ferrocyanide – Similar to E535; used in salt products. Considered safe in trace amounts.

538 or E538: Calcium ferrocyanide – Anti-caking agent. Similar safety profile to E535 and E536.

539 or E539: Sodium thiosulfate – Antioxidant and dough conditioner. Safe in small amounts.

540 or E540: Dicalcium diphosphate – Emulsifier and acidity regulator. Generally safe.

541 or E541: Sodium aluminum phosphate – Acidic leavening agent. Contains aluminum; potential long-term health concerns.

542 or E542: Bone phosphate (Edible bone phosphate) – Anti-caking agent. Safe but less commonly used.

543 or E543: Calcium sodium polyphosphate – Emulsifier and stabilizer. Safe in regulated amounts.

544 or E544: Calcium polyphosphate – Similar to E543; used in processed cheese. Safe in food-grade form.

545 or E545: Ammonium polyphosphate – Emulsifier. Limited use in food.

550 or E550: Sodium silicate – Anti-caking agent. Safe in small amounts but not widely used.

551 or E551: Silicon dioxide (Silica) – Anti-caking agent in powders. Considered safe and non-toxic.

552 or E552: Calcium silicate – Anti-caking agent. Safe in food-grade quantities.

E553a: (i) Magnesium silicate (ii) Magnesium trisilicate – Anti-caking agents. Safe in small amounts but may contain traces of asbestos (if not food-grade purified).

E553b: Talc (Magnesium silicate hydrate) – Anti-caking agent. Controversial due to potential asbestos contamination (must be food-grade).

554 or E554: Sodium aluminosilicate – Anti-caking agent. Contains aluminum; potential health concerns with excessive intake.

555 or E555: Potassium aluminosilicate – Similar to E554; aluminum-related concerns apply.

556 or E556: Calcium aluminosilicate – Anti-caking agent. Contains aluminum; limited use.

558 or E558: Bentonite – Anti-caking agent. Generally safe.

559 or E559: Aluminum silicate (Kaolin) – Anti-caking agent. Contains aluminum; potential long-term concerns.

570 or E570: Stearic acid (Fatty acid) – Anti-caking agent and emulsifier. Safe, derived from vegetable fats.

574 or E574: Gluconic acid – Acidity regulator. Safe in food.

575 or E575: Glucono delta-lactone – Acidity regulator and sequestrant. Safe and used in tofu production.

576 or E576: Sodium gluconate – Chelating agent. Safe in small amounts.

577 or E577: Potassium gluconate – Similar to E576; safe in food.

578 or E578: Calcium gluconate – Firming agent and mineral supplement. Safe.

579 or E579: Ferrous gluconate – Iron supplement and color stabilizer (black olives). Safe but excessive iron can be toxic.

585 or E585: Ferrous lactate – Iron supplement. Safe in regulated amounts.

620 or E620: L-Glutamic acid – A naturally occurring amino acid used to enhance umami flavor. Generally recognized as safe (GRAS) by the FDA, but some individuals may experience "Chinese Restaurant Syndrome" (headaches, sweating) due to sensitivity.

621 or E621: Monosodium glutamate (MSG) – A widely used flavor enhancer. Considered safe by major health organizations, but some people report mild reactions (headaches, nausea). No conclusive evidence of long-term harm at normal dietary levels.

622 or E622: Monopotassium glutamate – Similar to MSG but with potassium. Safe for most, but those sensitive to glutamate should avoid it.

623 or E623: Calcium diglutamate – Another glutamate-based enhancer. Safe in moderation, but may trigger reactions in sensitive individuals.

624 or E624: Monoammonium glutamate – Used in savory foods. Similar safety profile to MSG, but

ammonium content may be a concern in very high doses.

625 or E625: Magnesium diglutamate – Less common glutamate salt. Safe in small amounts but unnecessary for most diets.

626 or E626: Guanylic acid (GMP) – A nucleotide flavor enhancer often paired with MSG. Naturally found in meat and mushrooms. Safe for general consumption.

627 or E627: Disodium guanylate (Sodium guanylate) – Enhances savory taste. Should be avoided by people with gout or purine metabolism issues (derived from fish or yeast).

628 or E628: Dipotassium guanylate – Similar to E627. Safe but not recommended for those with gout.

629 or E629: Calcium guanylate – Another guanylate variant. Same precautions as E627–E628 apply.

630 or E630: Inosinic acid (IMP) – Naturally occurring in meat and fish. Enhances umami flavor. Safe but may affect individuals with gout.

631 or E631: Disodium inosinate – Often combined with MSG or guanylate. Derived from meat or fish; unsuitable for vegetarians/vegans. May worsen gout.

632 or E632: Potassium inosinate – Similar to E631. Same restrictions apply.

633 or E633: Calcium inosinate – Less common; same safety profile as E631–E632.

634 or E634: Calcium 5'-ribonucleotides – A mix of guanylate and inosinate. Enhances savory flavors. Safe but may contain purines (avoid with gout).

635 or E635: Disodium 5'-ribonucleotides – A potent flavor enhancer (combination of E627 + E631). May cause reactions in sensitive individuals.

636 or E636: Maltol – Sweet flavor enhancer used in baked goods and beverages. Considered safe in small amounts.

637 or E637: Ethyl maltol – Similar to maltol but stronger. Safe at regulated levels.

640 or E640: Glycine and its sodium salt – Amino acid used as a flavor enhancer and sweetener. Generally safe, but excessive intake may cause digestive discomfort.

650 or E650: Zinc acetate – Used in chewing gum for freshness. Safe in small amounts, but excess zinc can cause nausea.

900 or E900: Dimethyl polysiloxane (Dimethicone) – Anti-foaming agent in oils and fried foods. Considered safe by FDA and EFSA; non-toxic and non-absorbable by the body.

901 or E901: Beeswax (White & Yellow) – Natural glazing agent for candies and fruits. Safe for most, but vegans avoid it. Rare allergic reactions possible.

902 or E902: Candelilla wax – Plant-based glazing agent (vegan alternative to beeswax). Generally recognized as safe (GRAS).

903 or E903: Carnauba wax – Derived from palm leaves; used in chewing gum and coatings. Non-toxic and safe for consumption.

904 or E904: Shellac – Resin secreted by lac bugs; glazing agent for candies and pills. Safe but not vegan/vegetarian. Rare allergies reported.

905 or E905: Microcrystalline wax (Paraffin wax) – Used in chewing gum and coatings. Non-digestible but considered harmless.

907 or E907: Hydrogenated poly-1-decene – Glazing agent for candies. Limited toxicity data; approved in EU but not in USA.

912 or E912: Montan acid esters – Glazing agent for fruits. Approved in EU; no significant safety concerns.

914 or E914: Oxidized polyethylene wax – Coating for fruits and cheeses. Considered non-toxic but not digestible.

920 or E920: L-Cysteine (and its hydrochlorides) – Dough conditioner from animal/human hair or synthetic sources. Safe but controversial for vegetarians/vegans.

921 or E921: L-Cystine – Similar to E920; derived from keratin. Safe but same ethical concerns.

E927b: Carbamide (Urea) – Used in chewing gum and baked goods. Safe in small amounts; excess may cause digestive issues.

928 or E928: Benzoyl peroxide – Flour bleaching agent. Approved in some countries but banned in EU due to potential formation of harmful byproducts.

938 or E938: Argon – Inert packaging gas for wine and snacks. Non-toxic and safe.

939 or E939: Helium – Used as a propellant in whipped cream. Safe but inhalation risks (asphyxiation).

941 or E941: Nitrogen – Prevents oxidation in packaged foods. Harmless and non-reactive.

942 or E942: Nitrous oxide (Laughing gas) – Whipping agent in cream dispensers. Safe in food but recreational misuse is dangerous.

E943a: Butane – Propellant in cooking sprays. Flammable but safe in trace amounts.

E943b: Isobutane – Similar to E943a; used in aerosol oils. Generally safe in food use.

944 or E944: Propane – Another aerosol propellant. Safe in food-grade applications.

948 or E948: Oxygen – Used in modified atmosphere packaging. Non-toxic but supports combustion.

949 or E949: Hydrogen – Packaging gas for fats. Safe but highly flammable in pure form.

950 or E950: Acesulfame potassium (Ace-K) – Artificial sweetener (200x sweeter than sugar). FDA-approved but controversial; some studies link to gut microbiome changes.

951 or E951: Aspartame – Low-calorie sweetener. Safe for most, but phenylketonurics (PKU) must avoid it. Linked to debates over headaches and metabolic effects.

952 or E952: Cyclamic acid & its salts (Sodium cyclamate) – Banned in the USA (cancer concerns in 1970s) but allowed in EU/Canada at restricted levels.

953 or E953: Isomalt – Sugar alcohol from beet sugar. May cause bloating/diarrhea in excess but safe for teeth.

954 or E954: Saccharin – Artificial sweetener. Once linked to bladder cancer (debunked in humans); allowed globally with limits.

955 or E955: Sucralose – Chlorinated sugar substitute (600x sweeter than sugar). FDA-approved but some studies suggest metabolic effects at high doses.

956 or E956: Alitame – High-intensity sweetener. Approved in few countries (not EU/USA); limited safety data.

957 or E957: Thaumatin – Natural sweetener from katemfe fruit. Safe but rare allergies possible.

959 or E959: Neohesperidin dihydrochalcone – Citrus-derived sweetener. Approved in EU; no major safety concerns.

960 or E960: Steviol glycosides (Stevia) – Natural sweetener from stevia plant. Recognized as safe; may cause mild GI issues in excess.

961 or E961: Neotame – Artificial sweetener (7,000–13,000x sweeter than sugar). FDA-approved; fewer concerns than aspartame.

962 or E962: Salt of aspartame-acesulfame – Blend of E951 + E950. Similar safety profile to aspartame.

965 or E965: Maltitol (i) Maltitol (ii) Maltitol syrup – Sugar alcohol; may cause laxative effects in high doses. Safe for diabetics.

966 or E966: Lactitol – Another sugar alcohol. Gentle laxative effect; safe for most.

967 or E967: Xylitol – Tooth-friendly sweetener. Toxic to dogs but safe for humans (may cause bloating).

968 or E968: Erythritol – Low-calorie sugar alcohol. Well-tolerated but linked to potential cardiovascular risks in recent studies (needs further research).

969 or E969: Advantame – Ultra-potent sweetener (20,000x sweeter than sugar). FDA-approved; derived from aspartame but safer for PKU individuals.

1000 or E1000: Cholic Acid – A bile acid used as an emulsifier. Naturally occurring but may cause digestive upset in high doses. Not widely used in food.

1001 or E1001: Choline salts (e.g., choline chloride) – Used as emulsifiers and dietary supplements. Essential nutrient, but excessive intake may cause low blood pressure or fishy body odor.

1100 or E1100: Amylase – Enzyme that breaks down starch into sugars. Derived from fungi or bacteria. Safe for consumption; used in baking and brewing.

1103 or E1103: Invertase – Enzyme that splits sucrose into glucose and fructose. Used in candies. Safe; no known toxicity.

1105 or E1105: Lysozyme – Antimicrobial enzyme (from egg whites). Used in cheese production. Safe but allergenic to those with egg allergies.

1200 or E1200: Polydextrose – Synthetic soluble fiber used as a bulking agent. May cause bloating or diarrhea in large amounts but generally recognized as safe (GRAS).

1201 or E1201: Polyvinylpyrrolidone (PVP) – Stabilizer in beverages. Considered safe but not digestible.

1202 or E1202: Polyvinylpolypyrrolidone (PVPP) – Clarifying agent in beer/wine. Non-toxic but not absorbed by the body.

1400 or E1400: Dextrin – Starch-derived thickener. Safe; commonly used in processed foods.

1401 or E1401: Modified starch – Chemically altered starch for texture. Safe but may spike blood sugar.

1404 or E1404: Oxidized starch – Used in sauces and soups. No known health risks.

1410 or E1410: Monostarch phosphate – Thickening agent. Safe in moderate amounts.

1412 or E1412: Distarch phosphate – Stabilizer in dairy products. Non-toxic.

1414 or E1414: Acetylated distarch phosphate – Resistant to heat/acid. Safe for consumption.

1420 or E1420: Acetylated starch – Used in frozen foods. No adverse effects reported.

1422 or E1422: Acetylated distarch adipate – Thickener in sauces. Safe but may cause bloating.

1440 or E1440: Hydroxypropyl starch – Improves texture in baked goods. GRAS status in the USA.

1442 or E1442: Hydroxypropyl distarch phosphate – Stabilizer in puddings. Safe in food-grade amounts.

1450 or E1450: Starch sodium octenyl succinate – Emulsifier in powdered drinks. Approved in the EU/USA.

1451 or E1451: Acetylated oxidized starch – Used in coatings. No known toxicity.

1452 or E1452: Starch aluminum octenyl succinate – Contains aluminum; limited use due to potential long-term toxicity concerns.

1503 or E1503: Castor oil – Solvent for flavors. Safe in small amounts but strong laxative in high doses.

1505 or E1505: Triethyl citrate – Foam stabilizer. Non-toxic and biodegradable.

1510 or E1510: Ethanol (Alcohol) – Solvent for food colorings. Safe in trace amounts.

1517 or E1517: Glyceryl diacetate (Diacetin) – Humectant in baked goods. Low toxicity.

1518 or E1518: Glyceryl triacetate (Triacetin) – Used in chewing gum. Safe and rapidly metabolized.

1519 or E1519: Benzyl alcohol – Preservative/flavoring. Safe in small doses; toxic in high amounts (linked to infant toxicity).

1520 or E1520: Propylene glycol – Humectant and solvent. GRAS but controversial; may cause allergies in sensitive individuals.

1521 or E1521: Polyethylene glycol (PEG) – Thickener. Safe in small amounts but not digestible.

INS 100: Curcumins - Natural yellow-orange dye derived from turmeric. Safety: Approved by FDA, EFSA, and FSSAI. Generally recognized as safe (GRAS) but may cause allergies in sensitive

individuals. No known bans.

INS 100(i): Curcumin - Purified form of curcumins. Safety: Safe for general use (FDA, EFSA). High doses may cause mild gastrointestinal issues. Banned in some EU countries for specific applications due to potential medicinal effects.

INS 100(ii): Turmeric - Natural extract used as a colourant. Safety: Safe (WHO/FSSAI). Rare allergic reactions reported. Not banned globally.

INS 101: Riboflavins - Vitamin B2 derivatives, yellow-orange colour. Safety: Safe (FDA GRAS, EFSA). Excess may cause bright yellow urine but no toxicity. No bans.

INS 101(i): Riboflavin (synthetic) - Synthetic Vitamin B2. Safety: Safe for all (EFSA/FDA). No health risks at approved levels.

INS 101(ii): Riboflavin-5-Phosphate - Water-soluble form of B2. Safety: Safe (EFSA). No bans.

INS 101(iii): Riboflavin from Bacillus subtilis - Fermented B2. Safety: Approved by EFSA/FDA. No known risks.

INS 102: Tartrazine (FD&C; Yellow #5) - Synthetic yellow dye. Safety: Approved but linked to hyperactivity in children (EU requires warning labels). Banned in Norway and Austria. FDA mandates allergen labeling.

INS 103: Alkannin/Chrysoine Resorcinol - Red dye. Safety: Banned in the US (FDA) and EU due to potential carcinogenicity. Restricted in India (FSSAI).

INS 104: Quinoline Yellow (D&C; Yellow #10) - Synthetic yellow dye. Safety: Banned in the US for food (allowed in cosmetics). EU approves with restrictions (EFSA). Linked to ADHD in children.

INS 107: Yellow 2G - Synthetic yellow dye. Safety: Banned in the EU (EFSA) and US due to genotoxicity concerns. FSSAI permits limited use.

INS 110: Sunset Yellow FCF (FD&C; Yellow #6) - Synthetic orange dye. Safety: Approved but restricted in the EU (warning labels for hyperactivity). Banned in Norway. FDA considers it safe at approved levels.

INS 111: Orange GGN (Delisted) - Synthetic orange dye. Safety: Banned in the EU/US due to carcinogenic metabolites (EFSA/FDA). Not approved in India (FSSAI).

INS 120: Cochineal/Carmine - Red dye from insects. Safety: Approved but requires allergen labeling (FDA/EFSA). May cause severe allergic reactions (anaphylaxis). Vegan restrictions apply.

INS 121: Citrus Red 2/Orcein - Red dye. Safety: Banned in the EU and India (FSSAI). FDA allows

only for citrus fruit peels (not ingested). Potential carcinogen.

INS 122: Azorubine/Carmoisine - Synthetic red dye. Safety: Banned in the US (FDA). EU approves with warnings (EFSA). Linked to hyperactivity. FSSAI permits limited use.

INS 123: Amaranth (Delisted) - Red dye. Safety: Banned in the US (FDA) since 1976 due to carcinogenicity. Prohibited in the EU and India (FSSAI).

INS 124: Ponceau 4R - Synthetic red dye. Safety: Banned in the US (FDA). EU restricts use (EFSA). Potential allergen. FSSAI approves with limits.

INS 125: Ponceau SX - Synthetic red dye. Safety: Banned in the EU/US (carcinogenicity concerns). Not approved in India (FSSAI).

INS 126: Ponceau 6R (Delisted) - Synthetic red dye. Safety: Banned globally (FDA/EFSA/FSSAI) due to toxicity.

INS 127: Erythrosine (FD&C; Red #3) - Pink dye. Safety: FDA restricts use in cosmetics (thyroid tumor risks). EU approves for food with limits (EFSA). FSSAI permits use.

INS 128: Red 2G - Synthetic red dye. Safety: Banned in the EU (EFSA) due to carcinogenic metabolites. Not approved in the US/India.

INS 129: Allura Red AC (FD&C; Red #40) - Synthetic red dye. Safety: Approved but controversial

(hyperactivity in children). EU requires warning labels. Banned in Switzerland. FDA considers it safe.

INS 130: Indanthrene Blue RS - Synthetic blue dye. Safety: Not approved for food in the EU/US (FDA/EFSA). Limited data on safety. FSSAI does not list it as approved.

INS 131: Patent blue V - colour (blue). [Safety assessment needed from EFSA/FSSAI]

INS 132: Indigo carmine, indigotine - colour (blue) (FDA: FD&C; Blue #2). FDA approved but may cause allergic reactions in sensitive individuals. Banned in Norway.

INS 133: Brilliant blue FCF - colour (FDA: FD&C; Blue #1). FDA approved but restricted in some European countries. May cause hyperactivity in children.

INS 140: Chlorophylls - colour (green). Generally recognized as safe (GRAS) by FDA. Natural origin.

INS 141: Chlorophylls and chlorophyllins, copper complexes - colour (green). Approved with limitations in some countries due to copper content.

INS 141(i): Chlorophylls, copper complexes - colour (green). [Safety assessment needed]

INS 141(ii): Chlorophyllins, copper complexes, potassium and sodium salts - colour (green). [Safety assessment needed]

INS 142: Green S - colour (green). Banned in US, Canada, Japan. Allowed in EU with restrictions.

INS 143: Fast green FCF - colour (FDA: FD&C; Green #3). FDA approved but restricted in EU and other countries.

INS 150: Caramels – General class of caramel colors. Safety: Approved by FDA (GRAS) and EFSA, but some types (150c, 150d) may contain 4-MEI (a potential carcinogen in high doses). Restricted in California (Prop 65 warning required).

INS 150a: Caramel I (Plain) – Heat-treated sugar. Safety: Considered the safest form; no sulfites/ammonia. Approved globally (FDA, EFSA, FSSAI).

INS 150b: Caramel II (Sulfite Caramel) – Contains sulfites. Safety: May trigger allergies in sulfite-sensitive individuals. Banned in some countries for certain uses.

INS 150c: Caramel III (Ammonia Caramel) – Contains ammonia compounds. Safety: EFSA sets limits due to 4-MEI formation. Avoided in organic foods.

INS 150d: Caramel IV (Sulfite-Ammonia Caramel) – Contains both sulfites and ammonia. Safety: Highest 4-MEI risk. Restricted in some US states (Prop 65).

INS 151: Brilliant Black BN (Black PN) – Synthetic black dye. Safety: Banned in the US, Canada, and Japan; allowed in the EU (EFSA-approved with ADI of 1 mg/kg).

INS 152: Carbon Black – Industrial pigment. Safety: Not approved for food in the US/EU. Used in cosmetics only.

INS 153: Vegetable Carbon – Plant-derived black color. Safety: Approved by FDA, EFSA, and FSSAI. Considered natural but may contain PAHs (carcinogens) if poorly processed.

INS 154: Brown FK – Synthetic brown dye. Safety: Banned in the US and Canada; allowed in the EU for specific products (e.g., kippers). Linked to hyperactivity in children.

INS 155: Chocolate Brown HT – Synthetic brown dye. Safety: Allowed in the EU (ADI 1.5 mg/kg) but banned in the US. May cause allergic reactions.

INS 160a: Carotenes (General) – Natural pigments (orange/yellow). Safety: Approved globally (FDA, EFSA). High doses may cause carotenemia (harmless skin yellowing).

INS 160a(i): Beta-Carotene (Synthetic) – Lab-made. Safety: GRAS (FDA). Excessive intake linked to lung cancer risk in smokers (WHO caution).

INS 160a(ii): Beta-Carotene (Vegetable) – Extracted from plants. Safety: Safest form; no restrictions.

INS 160a(iii): Beta-Carotene (Blakeslea trispora) – Fermentation-derived. Safety: EFSA-approved. Non-toxic.

INS 160a(iv): Beta-Carotene (Algae) – From algae like Dunaliella. Safety: Natural and safe; used in organic foods.

INS 160b: Annatto Extracts - Natural colorant derived from the seeds of the Bixa orellana tree. Safety: Generally recognized as safe (GRAS) by FDA; EFSA approves with ADI of 0.065 mg/kg body weight (bixin) and 0.6 mg/kg (norbixin). Rare allergic reactions reported. Banned in some EU uses for non-food products. Safe for most; caution for sensitive individuals.

INS 160b(i): Annatto Extracts, Bixin-based - Oil-soluble pigment. Safety: EFSA considers it safe within limits. No widespread bans. May cause hypersensitivity in rare cases.

INS 160b(ii): Annatto Extracts, Norbixin-based - Water-soluble pigment. Safety: Similar to bixin; ADI applies. Approved in EU/US/India but restricted in some non-food applications.

INS 160c: Paprika Oleoresin - Extract from Capsicum annuum. Safety: Approved by FDA, EFSA, and FSSAI. No significant risks; may cause mild irritation in high doses. Safe for general use.

INS 160d: Lycopenes - Antioxidant pigment found in tomatoes. Safety: EFSA/FDA approve synthetic and natural sources. ADI of 0.5 mg/kg (EFSA). Safe for most; excessive intake may cause carotenodermia (harmless skin discoloration).

INS 160d(i): Synthetic Lycopene - Chemically identical to natural lycopene. Safety: EFSA-approved. No known bans. Safe within recommended limits.

INS 160d(ii): Tomato Lycopene - Naturally derived. Safety: Considered safe by all major agencies. No restrictions.

INS 160d(iii): Lycopene from Blakeslea trispora - Fermentation-derived. Safety: EFSA-approved. Non-toxic; ADI applies. Safe for general consumption.

INS 160e: Beta-apo-8'-carotenal (C30) - Synthetic carotenoid. Safety: FDA/EFSA-approved with ADI of 0.05 mg/kg. No bans; safe in regulated amounts.

INS 160f: Ethyl Ester of Beta-apo-8'-carotenic Acid - Derived from carotenal. Safety: Similar to INS 160e; ADI of 0.05 mg/kg (EFSA). No significant risks reported.

INS 161a: Flavoxanthin - Natural yellow pigment. Safety: Limited data; not widely evaluated. Banned in some regions due to insufficient safety evidence. Avoid pending further studies.

INS 161b: Luteins - Antioxidant from marigolds. Safety: Approved by FDA/EFSA/FSSAI. ADI of 1 mg/kg (EFSA). Safe for general use; supports eye health.

INS 161b(i): Lutein from Tagetes erecta - Marigold-derived. Safety: Well-studied; no bans. Safe within limits.

INS 161b(ii): Tagetes Extract - Source of lutein/zeaxanthin. Safety: Approved in EU/US. May contain traces of toxic compounds if improperly processed; regulated for purity.

INS 161c: Kryptoxanthin - Provitamin A carotenoid. Safety: Naturally occurring; no major restrictions. Safe in food amounts.

INS 161d: Rubixanthin - Rare carotenoid. Safety: Insufficient data; not widely approved. Avoid in regulated markets.

INS 161e: Violaxanthin - Plant pigment. Safety: Limited regulatory review. Not banned but lacks broad approval.

INS 161f: Rhodoxanthin - Red pigment. Safety: Rarely used; safety unclear. Not evaluated by major agencies.

INS 161g: Canthaxanthin - Synthetic/orange pigment. Safety: FDA/EFSA-approved with ADI of 0.03 mg/kg. Restricted in cosmetics (EU); high doses may cause retinopathy. Avoid excessive intake.

INS 161h: Zeaxanthins - Eye-health pigment. Safety: Approved in EU/US. ADI of 0.75 mg/kg (EFSA). Safe for most; synthetic forms equally regulated.

INS 161h(i): Synthetic Zeaxanthin - Lab-produced. Safety: EFSA-approved. No known risks at approved levels.

INS 161h(ii): Zeaxanthin-rich Tagetes Extract - Natural source. Safety: Similar to synthetic zeaxanthin; purity regulated. No bans.

INS 162: Beet Red (Betanin) - Natural red pigment from beets. Safety: Approved by FDA, EFSA, and FSSAI. Generally safe but may cause allergic reactions in sensitive individuals.

INS 163: Anthocyanins - Natural pigments from fruits/vegetables. Safety: Recognized as safe (FDA GRAS, EFSA). No known risks; may benefit health.

INS 163(ii): Grape Skin Extract - Anthocyanin-rich extract. Safety: Approved globally (FDA, EFSA). Safe for general consumption.

INS 163(iii): Blackcurrant Extract - Natural colourant. Safety: Approved (EFSA/FSSAI). No adverse effects reported.

INS 163(iv): Purple Corn Colour - Derived from maize. Safety: Approved (FDA/EFSA). Non-toxic; limited allergenicity.

INS 163(v): Red Cabbage Colour - Anthocyanin-based. Safety: Permitted worldwide (EFSA/FSSAI). Safe for most populations.

INS 164: Gardenia Yellow - Natural yellow pigment. Safety: Approved in EU/Asia (FSSAI). Potential laxative effect in high doses.

INS 165: Gardenia Blue - Derived from gardenia fruits. Safety: Approved in Asia/EU. Limited data; avoid in pregnancy.

INS 166: Sandalwood - Rarely used as colourant. Safety: Not widely evaluated; potential restrictions in some countries.

INS 170: Calcium Carbonates - Multi-functional additive. Safety: Approved (FDA GRAS, EFSA). Safe but high doses may cause hypercalcemia.

INS 170(i): Calcium Carbonate - Used as colourant/anticaking agent. Safety: Recognized as safe (WHO/FSSAI). Excessive intake risky for kidney disorders.

INS 170(ii): Calcium Hydrogen Carbonate - Similar to 170(i). Safety: EFSA-approved. Avoid in individuals with kidney stones.

INS 171: Titanium Dioxide (E171) - White pigment. Safety: EFSA (2021) reclassified it as "not safe" due to genotoxicity concerns; banned in the EU. FDA still permits limited use (e.g., in candies). FSSAI allows it but advises caution.

INS 172: Iron Oxides - Natural/synthetic pigments (black/red/yellow). Safety: Approved by FDA, EFSA, and FSSAI. Considered safe but avoid excessive intake (iron overload risk).

INS 172(i): Iron Oxide Black (E172i) - Safety: Non-toxic; approved globally. Safe for general use.

INS 172(ii): Iron Oxide Red (E172ii) - Safety: EFSA/FDA-approved. No significant risks at permitted levels.

INS 172(iii): Iron Oxide Yellow (E172iii) - Safety: Recognized as safe; may contain traces of heavy metals (regulated limits).

INS 173: Aluminium (E173) - Silver colourant. Safety: EFSA restricts use due to neurotoxicity concerns. Banned in some countries (e.g., Australia). Avoid in children’s foods.

INS 174: Silver (E174) - Metallic colourant. Safety: Approved for limited use (e.g., decorations). EFSA notes potential argyria (skin discoloration) with chronic exposure.

INS 175: Gold (E175) - Inert metallic pigment. Safety: Non-toxic; approved for surface decoration (FDA/EFSA). No known health risks.

INS 180: Lithol Rubine BK (E180) - Synthetic red dye. Safety: EFSA/FDA permit restricted use. Linked to hyperactivity in children (EU requires warning labels).

INS 181: Tannins - Natural polyphenols. Safety: Generally safe (FDA GRAS). High doses may cause liver/kidney issues (FSSAI recommends limits).

INS 182: Orchil (Natural Red 28) - Lichen-derived dye. Safety: Limited safety data; banned in some regions (e.g., USA). Avoid in absence of approval.

INS 200: Sorbic Acid - Preservative. Safety: Approved globally (EFSA/FDA). Safe but may trigger mild allergies (e.g., skin irritation).

INS 201: Sodium Sorbate - Safety: Recognized as safe (EFSA). No significant risks at permitted levels.

INS 202: Potassium Sorbate - Safety: Widely used; non-carcinogenic (WHO). May cause pseudo-allergies in sensitive individuals.

INS 203: Calcium Sorbate - Safety: Similar to INS 200–202; approved by FSSAI/EFSA.

INS 209: Heptyl p-Hydroxybenzoate - Rare preservative. Safety: Not approved in EU/USA; restricted due to potential endocrine disruption.

INS 210: Benzoic Acid - Preservative. Safety: Approved but controversial. EFSA sets strict limits due to asthma/ADHD risks in children.

INS 211: Sodium Benzoate - Preservative. Generally recognized as safe (GRAS) by FDA in low doses. WHO notes potential allergic reactions in sensitive individuals. Linked to hyperactivity in children when combined with artificial colors. Not banned but restricted in some EU products.

INS 212: Potassium Benzoate - Preservative. Similar safety profile to sodium benzoate. FDA-approved. May form benzene (carcinogen) in acidic conditions with vitamin C. Avoid in high-risk combinations. Safe for general use within limits.

INS 213: Calcium Benzoate - Preservative. Considered safe by FDA and EFSA. No significant health risks at approved levels. Rare cases of intolerance in asthma patients.

INS 214: Ethyl Para-Hydroxybenzoate - Preservative. Approved by FDA/EFSA but controversial due to potential endocrine disruption. Banned in infant foods in some countries. Safe in small quantities for adults.

INS 215: Sodium Ethyl Para-Hydroxybenzoate - Preservative. Similar concerns as INS 214. Restricted in organic foods (EU). FDA permits use within limits. Avoid for children or pregnant women.

INS 216: Propylparaben - Preservative. Banned in EU for cosmetics; restricted in foods for infants. FDA allows limited use. Potential estrogenic effects. High-risk for hormone-sensitive disorders.

INS 217: Sodium Propyl Para-Hydroxybenzoate - Preservative. Same risks as INS 216. Avoid in large quantities. Not banned but discouraged in several countries.

INS 218: Methylparaben - Preservative. FDA-approved; low toxicity. Possible skin allergies. EFSA considers it safe in food at current levels. Less controversial than propylparaben.

INS 219: Sodium Methyl Para-Hydroxybenzoate - Preservative. Similar to INS 218. Safe for most people but may trigger allergies. No widespread bans.

INS 220: Sulfur Dioxide - Preservative & antioxidant. Can cause asthma attacks in sulfite-sensitive individuals. FDA mandates labeling. Banned in fresh produce (US). Safe for non-sensitive populations at regulated doses.

INS 221: Sodium Sulfite - Preservative & antioxidant. EFSA/FDA approved with warnings for asthmatics. May cause headaches in sensitive people. Restricted in raw meats (Australia).

INS 222: Sodium Bisulfite - Preservative & antioxidant. Similar risks to INS 221. Requires clear labeling in US/EU. Safe for general use except sulfite-allergic individuals.

INS 223: Sodium Metabisulfite - Preservative, antioxidant, & bleaching agent. Can degrade vitamin B1. Banned in thiamine-rich foods (EU). Strict limits apply globally.

INS 224: Potassium Metabisulfite - Preservative & antioxidant. Same precautions as INS 223. Avoid in high doses due to potential kidney stress. Approved with restrictions.

INS 225: Potassium Sulfite - Preservative & antioxidant. Less common but similar to other sulfites. FDA-approved with allergy warnings. No bans reported.

INS 226: Calcium Sulfite - Preservative & antioxidant. Rarely used. Considered safe by WHO/FDA but carries standard sulfite warnings for sensitive groups.

INS 227: Calcium Bisulfite (Calcium Hydrogen Sulfite) - Preservative & antioxidant. Similar risks to other sulfites (e.g., asthma triggers). FDA-approved but requires labeling in the US. Restricted in fresh foods. Safe for non-sensitive individuals.

INS 228: Potassium Bisulfite (Potassium Hydrogen Sulfite) - Preservative & antioxidant. EFSA notes potential allergic reactions. Banned in raw meats (Australia). Safe within limits for most people.

INS 230: Diphenyl (Biphenyl) - Preservative. Used on citrus fruits. FDA allows limited use; banned in EU for direct food addition. Potential skin irritant. Avoid ingestion of treated peels.

INS 231: Orthophenyl Phenol (2-Hydroxybiphenyl) - Preservative. Applied to fruit surfaces. Classified as "possibly carcinogenic" by IARC. EU restricts use; FDA permits with residue limits.

INS 232: Sodium Orthophenyl Phenol - Preservative. Similar risks to INS 231. Banned in organic foods (EU). FDA-approved for citrus with strict limits.

INS 233: Thiabendazole - Preservative (antifungal). Used on bananas/citrus. FDA permits residues <10 ppm. Linked to liver toxicity in high doses. Avoid excessive peel consumption.

INS 234: Nisin - Natural preservative (bacteriocin). FDA/EFSA-approved. Safe for all, including infants. No known bans. Derived from fermentation.

INS 235: Natamycin (Pimaricin) - Preservative (antifungal). Approved by FDA/EFSA for cheese surfaces. May cause allergies in rare cases. Not permitted in liquids (EU).

INS 236: Formic Acid - Preservative. Naturally occurs in ants/plants. FDA GRAS; restricted in EU. Corrosive in pure form but safe in diluted food applications.

INS 237: Sodium Formate - Preservative. Derived from formic acid. Limited use; safe at low doses. No significant risks reported.

INS 238: Calcium Formate - Preservative. Similar to INS 237. Approved in animal feed (EU); less common in human foods. No major health concerns.

INS 239: Hexamethylene Tetramine (Hexamine) - Preservative. Banned in some countries (e.g., South Korea). FDA allows in provolone cheese. Forms formaldehyde (potential carcinogen).

INS 240: Formaldehyde - Preservative. IARC classifies as carcinogenic. Banned in food in EU/US (except residual traces). Used illegally in some imports (e.g., milk). Avoid.

INS 241: Gum Guaiacum - Preservative. Natural resin; FDA GRAS. Rare allergies. No bans but limited use due to flavor.

INS 242: Dimethyl Dicarbonate - Preservative (used in beverages). Converts to CO?/methanol. FDA-approved. EFSA notes safe levels but bans in ready-to-drink teas (EU).

INS 249: Potassium Nitrite - Preservative & color fixative. Linked to nitrosamines (carcinogens) with amines. Restricted in infant foods (EU). FDA limits bacon/processed meats.

INS 250: Sodium Nitrite - Similar to INS 249. WHO advises minimizing intake due to cancer risks. Required in cured meats to prevent botulism.

INS 251: Sodium Nitrate - Converts to nitrite in body. Same risks as INS 249/250. Banned in organic foods (US/EU). Essential for some cured products.

INS 252: Potassium Nitrate - Preservative & color fixative. Used in sausages. Less common than sodium variants. Similar cancer concerns; restricted in EU infant foods.

INS 260: Glacial acetic acid – Used as a preservative and acidity regulator. Safety: Approved by FDA, EFSA, and FSSAI. Generally recognized as safe (GRAS) in small quantities. High concentrations can cause irritation. No widespread bans. Safe for most people; avoid excessive consumption.

INS 261: Potassium acetates – Preservative and acidity regulator. Safety: Approved by FDA and EFSA. No significant health risks at permitted levels. Safe for general use but may affect individuals

with kidney disorders if consumed excessively.

INS 262: Sodium acetate, sodium hydrogen acetate – Used as preservatives and acidity regulators. Safety: GRAS status by FDA. EFSA confirms safety. May cause mild digestive issues in sensitive individuals. No bans.

INS 263: Calcium acetate – Preservative and acidity regulator. Safety: Approved globally (FDA, EFSA, FSSAI). Safe for consumption; excess may lead to hypercalcemia in rare cases. No restrictions.

INS 264: Ammonium acetate – Preservative and acidity regulator. Safety: Approved by EFSA but not widely used in food. Limited toxicity data. Avoid in large amounts. Not banned but less common.

INS 265: Dehydroacetic acid – Preservative. Safety: Not approved for food use in the EU or US (FDA). Banned in several countries due to potential toxicity. Avoid in food; used in cosmetics.

INS 266: Sodium dehydroacetate – Preservative. Safety: Similar to INS 265. Banned in food by EU and FDA. Restricted due to potential health risks. Not recommended.

INS 270: Lactic acid – Acidity regulator, preservative, antioxidant. Safety: Approved globally (FDA, EFSA, WHO). Safe for all, including infants. Naturally occurs in fermented foods. No health risks at normal levels.

INS 280-283: Propionic acid and salts (sodium/calcium/potassium propionate) – Preservatives. Safety: Approved by FDA and EFSA. May trigger migraines or ADHD symptoms in sensitive individuals. Generally safe; no bans.

INS 284-285: Boric acid, sodium tetraborate (borax) – Preservatives. Safety: Banned in food by EU and FDA due to toxicity (kidney damage, developmental risks). Avoid ingestion. Restricted to non-food uses.

INS 290: Carbon dioxide – Acidity regulator, propellant. Safety: GRAS by FDA. Safe in beverages; excessive intake may cause bloating. No health risks.

INS 296: Malic acid – Acidity regulator. Safety: Approved by FDA, EFSA. Naturally occurs in fruits. Safe for all; no adverse effects at normal levels.

INS 297: Fumaric acid – Acidity regulator. Safety: Approved globally. May cause allergies in rare cases. Safe for general use; no bans.

INS 300: Ascorbic acid (Vitamin C) – Antioxidant. Safety: GRAS by FDA, essential nutrient. Excessive intake may cause diarrhea. Safe for all; no restrictions.

INS 301: Sodium ascorbate – Water-soluble antioxidant. Safety: Approved by FDA (GRAS), EFSA, and WHO. Safe for general consumption; excess may cause kidney stones in susceptible individuals. No bans.

INS 302: Calcium ascorbate – Water-soluble antioxidant. Safety: Recognized as safe by FDA and EFSA. Provides calcium; excessive intake may lead to hypercalcemia. Safe for most people.

INS 303: Potassium ascorbate – Water-soluble antioxidant. Safety: Approved globally. Safe for general use, but high doses may affect individuals with kidney disorders. No restrictions.

INS 304: Ascorbyl palmitate/stearate – Fat-soluble antioxidants. Safety: Approved by FDA and EFSA. No significant risks at permitted levels. Safe for consumption.

INS 307-309: Tocopherols (natural/synthetic) – Antioxidants (Vitamin E derivatives). Safety: GRAS by FDA; EFSA confirms safety. Naturally occurring in foods. No health risks; synthetic forms (e.g., INS 308–309) are equally safe.

INS 310-312: Gallates (propyl/octyl/dodecyl) – Synthetic antioxidants. Safety: Approved by FDA and

EFSA but restricted in some countries (e.g., Japan bans propyl gallate). May cause allergies or hormonal effects in high doses. Use cautiously.

INS 315-316: Erythorbic acid & sodium erythorbate – Antioxidants. Safety: GRAS by FDA; EFSA-approved. Safe for general use, but excessive amounts may cause digestive issues. No bans.

INS 317-318: Erythorbin acid & sodium erythorbin – Antioxidants. Safety: Limited data; not widely evaluated. Status unclear in EU/US. Avoid until further studies confirm safety.

INS 319: Tert-butylhydroquinone (TBHQ) – Synthetic antioxidant. Safety: FDA-approved (GRAS) but restricted in the EU. High doses may cause nausea or liver effects. Use minimally.

INS 320: Butylated hydroxyanisole (BHA) – Fat-soluble antioxidant. Safety: FDA and EFSA permit limited use. Potential carcinogen (IARC Class 2B); banned in infant foods (EU). Avoid prolonged high intake.

INS 321: Butylated hydroxytoluene (BHT) – Fat-soluble antioxidant. Safety: Approved with limits by FDA/EFSA. Linked to liver/kidney effects in animal studies; banned in Japan. Use cautiously.

INS 322: Lecithins – Emulsifier/antioxidant (often soy-based). Safety: GRAS by FDA; EFSA-approved. Allergies possible in soy-sensitive individuals. Otherwise safe.

INS 325: Sodium lactate – Food acid/preservative. Safety: Approved globally. Safe for most;

excessive intake may imbalance electrolytes. No bans.

INS 326: Potassium lactate – Food acid/preservative. Safety: Approved by FDA (GRAS) and EFSA. Safe for general use; excessive intake may cause electrolyte imbalance in sensitive individuals. No bans.

INS 327: Calcium lactate – Food acid/calcium supplement. Safety: GRAS by FDA; EFSA-approved. Safe for consumption; high doses may lead to hypercalcemia. No restrictions.

INS 328: Ammonium lactate – Food acid. Safety: Approved by FDA but less common. Limited toxicity data; avoid excessive use. No major bans.

INS 329: Magnesium lactate – Food acid/magnesium source. Safety: Recognized as safe by FDA and EFSA. Excessive intake may cause diarrhea. Safe in moderation.

INS 330: Citric acid – Natural food acid. Safety: GRAS by FDA; EFSA and WHO confirm safety. Naturally occurs in citrus fruits. No health risks at normal levels.

INS 331: Sodium citrates – Food acid/pH regulator. Safety: Approved globally. Safe for most; high sodium content may affect blood pressure. No bans.

INS 332: Potassium citrates – Food acid/potassium source. Safety: GRAS by FDA; EFSA-approved. Beneficial for kidney health but may cause hyperkalemia in kidney patients.

INS 333: Calcium citrates – Food acid/firming agent. Safety: Safe per FDA and EFSA. Provides calcium; excessive intake may cause kidney stones. No restrictions.

INS 334: L(+)-Tartaric acid – Natural food acid (found in grapes). Safety: Approved by FDA and EFSA. Safe for general use; excess may cause digestive discomfort.

INS 335-337: Tartrates (sodium/potassium/potassium sodium) – Food acids. Safety: GRAS by FDA; EFSA-approved. Safe in moderation; high doses may act as laxatives. No bans.

INS 338: Phosphoric acid – Acidulant (common in sodas). Safety: FDA-approved but controversial. Linked to bone density loss and kidney issues in excessive amounts. Avoid overconsumption.

INS 339: Sodium phosphates – Mineral salts/preservatives. Safety: Approved with limits by FDA and EFSA. Excess may disrupt calcium/phosphorus balance; restricted in infant foods (EU).

INS 340: Potassium phosphates – Mineral salts. Safety: GRAS by FDA; EFSA sets safe limits. High intake may cause hyperkalemia in kidney patients. No bans.

INS 341: Calcium Phosphates - Used as a mineral salt, anti-caking agent, and firming agent. Safety: Approved by WHO/JECFA, FDA, and FSSAI. Generally recognized as safe (GRAS) but excessive intake may affect kidney function in susceptible individuals.

INS 342: Ammonium Phosphates - Used as a mineral salt. Safety: Approved by FDA and EU. No significant health risks at permitted levels, but high phosphate intake may be harmful to people with

kidney disease.

INS 343: Magnesium Phosphates - Used as a mineral salt and anti-caking agent. Safety: Considered safe by WHO and FDA; excessive intake may cause diarrhea or digestive discomfort.

INS 344: Lecithin Citrate - Used as a preservative. Safety: Approved by FDA (GRAS) and EU. Generally safe, but people with soy allergies should avoid it if derived from soy.

INS 345: Magnesium Citrate - Used as an acidity regulator. Safety: Recognized as safe by FDA; high doses may have a laxative effect.

INS 349: Ammonium Malate - Used as a food acid. Safety: Approved by EU and FDA in limited quantities. No major health risks reported.

INS 350: Sodium Malates - Used as a food acid. Safety: Approved by WHO/JECFA and FDA. Safe for general consumption but may affect sodium-sensitive individuals.

INS 351: Potassium Malate - Used as a food acid. Safety: Approved by EU and FDA. Safe for most people, but excessive potassium may harm those with kidney disorders.

INS 352: Calcium Malates - Used as a food acid. Safety: Considered safe by FDA and FSSAI; no known toxicity at approved levels.

INS 353: Metatartaric Acid - Used as a food acid and emulsifier. Safety: Approved by EU; no significant health risks reported.

INS 354: Calcium Tartrate - Used as a food acid and emulsifier. Safety: Recognized as safe by FDA; no adverse effects at normal intake levels.

INS 355: Adipic Acid - Used as a food acid. Safety: Approved by WHO/JECFA and FDA. Safe in moderation; high amounts may cause stomach irritation.

INS 356: Sodium Adipate - Used as a food acid. Safety: Approved by EU; similar safety profile to adipic acid.

INS 357: Potassium Adipate - Used as a food acid. Safety: Approved by FDA; excessive intake may affect potassium-sensitive individuals.

INS 359: Ammonium Adipates - Used as an acidity regulator. Safety: Limited data; approved in EU but not widely studied.

INS 363: Succinic Acid - Used as a food acid. Safety: GRAS by FDA; naturally occurring and safe in normal amounts.

INS 364: Sodium Succinates - Used as an acidity regulator and flavor enhancer. Safety: Approved by WHO/JECFA; no major concerns.

INS 365: Sodium Fumarate - Used as a food acid. Safety: Recognized as safe by FDA; no significant risks.

INS 366: Potassium Fumarate - Used as a food acid. Safety: Approved by EU; safe but caution for kidney patients.

INS 367: Calcium Fumarate - Used as a food acid. Safety: Considered safe by FDA; no toxicity reported.

INS 368: Ammonium Fumarate - Used as a food acid. Safety: Approved by EU; limited safety data available.

INS 370: 1,4-Heptonolactone - Used as a food acid. Safety: Approved in EU; insufficient long-term studies.

INS 375: Niacin (Nicotinic Acid), Nicotinamide (Vitamin B3) - Used as a color retention agent. Safety: Essential nutrient; high doses may cause flushing or liver issues.

INS 380: Triammonium Citrate - Used as a food acid. Safety: Approved by FDA and EU; safe in moderation.

INS 381: Ferric Ammonium Citrate (Ammonium Ferrocitrate) - Used as a food acid and iron fortifier. Safety: Approved by FDA and EFSA. Safe in small doses, but excessive iron intake can be toxic, especially for individuals with hemochromatosis.

INS 384: Isopropyl Citrates - Used as an antioxidant and preservative. Safety: Approved by FDA (GRAS) and EU. Limited studies; may cause mild irritation in sensitive individuals.

INS 385: Calcium Disodium EDTA - Used as a preservative to retain color/flavor. Safety: Approved by WHO/JECFA and FDA. Safe at low levels, but high doses may chelate minerals (e.g., zinc, iron). Banned in infant foods in the EU.

INS 386: Disodium Ethylenediaminetetraacetate (Disodium EDTA) - Used as an antioxidant/preservative. Safety: Similar to INS 385; approved but restricted in some foods (e.g., EU limits in processed meats).

INS 387: Oxystearin - Used as an antioxidant and sequestrant. Safety: Approved by FDA (GRAS). No significant risks reported, but limited long-term data.

INS 388: Thiodipropionic Acid - Used as an antioxidant. Safety: Approved by FDA; may break down into harmless byproducts. No major health concerns.

INS 389: Dilauryl Thiodipropionate - Used as an antioxidant. Safety: Approved by EU; considered safe but rarely used in modern foods.

INS 390: Distearyl Thiodipropionate - Used as an antioxidant. Safety: Similar to INS 389; minimal absorption in the body.

INS 391: Phytic Acid - Used as a preservative. Safety: Naturally occurring in plants. Safe but may

inhibit mineral absorption (e.g., iron, zinc) if consumed excessively.

INS 399: Calcium Lactobionate - Used as a stabilizer. Safety: Approved by FDA; low toxicity. May act as a prebiotic in gut health.

INS 400: Alginic Acid - Used as a thickener/gelling agent. Safety: Derived from seaweed; approved by WHO/JECFA and FDA. Safe for all, including vegans.

INS 401: Sodium Alginate - Used as a thickener/emulsifier. Safety: GRAS by FDA; may aid digestion. Rare allergies reported (seaweed-sensitive individuals).

INS 402: Potassium Alginate - Used as a stabilizer. Safety: Approved by EFSA. Safe but caution for those on potassium-restricted diets.

INS 403: Ammonium Alginate - Used as a gelling agent. Safety: Recognized as safe; may contain trace ammonia (insignificant at approved levels).

INS 404: Calcium Alginate - Used as a thickener. Safety: Approved globally. May benefit bone health due to calcium content.

INS 405: Propylene Glycol Alginate (PGA) - Used as an emulsifier. Safety: Approved by FDA/EFSA. Avoid in large amounts (may cause mild GI upset).

INS 406: Agar - Used as a vegetarian gelling agent. Safety: Natural seaweed extract; safe for all

diets (vegan/gluten-free). High doses may act as a laxative.

INS 407: Carrageenan - Used as a thickener/gelling agent derived from seaweed. Safety: Approved by FDA and EFSA. Degraded carrageenan (poligeenan) is not permitted due to potential inflammation risks. Whole carrageenan is considered safe, but some studies suggest caution for individuals with digestive disorders (e.g., IBS).

INS 407a: Processed Eucheuma Seaweed - Similar to carrageenan but less refined. Safety: Approved by EFSA and FDA. Generally recognized as safe (GRAS), but may cause mild bloating in sensitive individuals.

INS 409: Arabinogalactan - Used as a thickener (derived from larch trees). Safety: Approved by FDA (GRAS). Acts as a prebiotic; no known toxicity.

INS 410: Locust Bean Gum (Carob Gum) - Used as a stabilizer/thickener. Safety: Naturally derived; approved globally. Safe for all, including infants (used in baby formulas).

INS 412: Guar Gum - Used as a thickener/stabilizer. Safety: Approved by WHO/JECFA. High doses may cause digestive discomfort (e.g., gas, bloating).

INS 413: Tragacanth Gum - Used as an emulsifier/thickener. Safety: Approved by FDA and EFSA. Rare allergies reported (especially in individuals with legume allergies).

INS 414: Gum Acacia (Gum Arabic) - Used as a stabilizer/emulsifier. Safety: GRAS by FDA. Safe even at high doses; may benefit gut health as a prebiotic.

INS 415: Xanthan Gum - Used as a thickener/stabilizer (fermented from sugars). Safety: Approved globally. May cause laxative effects in large amounts.

INS 416: Karaya Gum - Used as a thickener/emulsifier. Safety: Approved by FDA. Rare cases of allergic reactions reported.

INS 417: Tara Gum - Used as a stabilizer/thickener. Safety: Similar to locust bean gum; approved by EFSA. No significant risks.

INS 418: Gellan Gum - Used as a gelling agent. Safety: GRAS by FDA. May cause mild digestive issues in sensitive individuals.

INS 420: Sorbitol - Used as a humectant/sweetener. Safety: Approved but excessive intake may cause diarrhea (laxative effect). Unsafe for pets (toxic to dogs).

INS 421: Mannitol - Used as a sweetener/anti-caking agent. Safety: Similar to sorbitol; may cause bloating. Avoid in large amounts for those with IBS.

INS 422: Glycerin (Glycerol) - Used as a humectant. Safety: GRAS by FDA. Safe in moderation; high doses may cause headaches or nausea.

INS 425: Konjac Gum (Glucomannan) - Used as a thickener. Safety: Approved by EFSA. Expands in the stomach—consume with water to avoid choking risk. Banned in jelly candies in the EU.

INS 428: Gelatin - Used as a gelling agent (derived from animal collagen). Safety: GRAS by FDA. Safe for most, but not suitable for vegetarians/vegans. Religious restrictions (e.g., halal/kosher concerns).

INS 430: Polyoxyethylene (8) Stearate - Used as an emulsifier. Safety: Limited data; approved in some regions but controversial due to potential synthetic byproducts. Avoid in organic/natural food certifications.

INS 431: Polyoxyethylene (40) stearate – An emulsifier. Safety: Approved by FDA/EFSA in limited quantities. No significant risks reported, but excessive intake may cause gastrointestinal discomfort.

INS 432: Polysorbate 20 – An emulsifier. Safety: Generally recognized as safe (GRAS) by FDA. EFSA notes no adverse effects at permitted levels. May cause allergies in sensitive individuals.

INS 433: Polysorbate 80 – An emulsifier. Safety: Approved by FDA/EFSA. Linked to gut microbiota changes in high doses (animal studies), but safe at regulated levels. Avoid if allergic to polyethylene glycol.

INS 434: Polysorbate 40 – An emulsifier. Safety: Similar to other polysorbates. EFSA considers it safe; no bans reported. May act as a mild laxative in excess.

INS 435: Polysorbate 60 – An emulsifier. Safety: GRAS (FDA). EFSA reaffirmed safety in 2017. No known bans.

INS 436: Polysorbate 65 – An emulsifier. Safety: Approved by FDA/EFSA. No major health risks; avoid if sensitive to emulsifiers.

INS 440: Pectin – A vegetable gum/emulsifier. Safety: Naturally derived, safe for all (FDA/WHO). No bans. May benefit gut health.

INS 441: Superglycerinated hydrogenated rapeseed oil – An emulsifier. Safety: EFSA-approved. Hydrogenated fats may contain trace trans fats; avoid if monitoring trans fat intake.

INS 442: Ammonium salts of phosphorylated glycerides – An emulsifier. Safety: Approved by EFSA/FDA. Limited data; avoid in excess. Not banned.

INS 443: Brominated vegetable oil (BVO) – Emulsifier/stabilizer. Safety: Banned in EU/India (FSSAI). FDA permits limited use (10 ppm) but may phase out due to thyroid/liver risks. Avoid.

INS 444: Sucrose acetate isobutyrate – Emulsifier/stabilizer. Safety: FDA/EFSA-approved. No significant risks at permitted levels.

INS 445: Glycerol esters of wood rosins – An emulsifier. Safety: Approved by FDA/EFSA. May cause allergies in rare cases.

INS 450: Diphosphates – Mineral salt/emulsifier. Safety: EFSA sets safe limits. Excess may imbalance calcium/phosphorus, risking kidney issues. Avoid with phosphate disorders.

INS 451: Triphosphates – Mineral salt/emulsifier. Safety: Similar to INS 450. High intake linked to cardiovascular risks. Regulated in EU/US.

INS 452: Polyphosphates – Mineral salt/emulsifier. Safety: Permitted but restricted in some foods (EFSA). Excess may cause electrolyte imbalances.

INS 459: Beta-cyclodextrin – An emulsifier. Safety: EFSA-approved. No known bans. Safe for most; may cause mild bloating.

INS 460: Powdered/microcrystalline cellulose – Anti-caking agent. Safety: Inert and safe (FDA/WHO). No bans. May reduce nutrient absorption in excess.

INS 461: Methylcellulose – Thickener/emulsifier. Safety: GRAS (FDA). May cause bloating. Approved globally.

INS 463: Hydroxypropyl cellulose – Thickener/emulsifier. Safety: EFSA-approved. No major risks; may affect digestion in high amounts.

INS 464: Hydroxypropyl methylcellulose – Thickener/emulsifier. Safety: Widely approved. May aid cholesterol reduction but cause temporary bloating.

INS 465: Methyl ethyl cellulose – Thickener/emulsifier. Safety: GRAS (FDA). No bans. Low toxicity; safe at permitted levels.

INS 466: Sodium carboxymethylcellulose – An emulsifier and thickener. Safety: Approved by FDA (GRAS) and EFSA. May cause bloating or diarrhea in high doses. Safe for general use.

INS 468: Crosslinked sodium carboxymethylcellulose – An emulsifier. Safety: Limited data; EFSA considers it safe at current usage levels. Not banned.

INS 469: Enzymatically hydrolyzed carboxymethyl cellulose – An emulsifier. Safety: EFSA-approved. No significant risks reported. May improve fiber intake.

INS 470: Magnesium stearate – Emulsifier/stabilizer. Safety: GRAS (FDA). Excessive intake may act as a laxative. Avoid in large quantities.

INS 470a: Sodium, potassium, and calcium salts of fatty acids – Emulsifier/anti-caking agent. Safety: Approved by EFSA/FDA. Safe in moderation; may affect mineral balance if overconsumed.

INS 470b: Magnesium salts of fatty acids – Emulsifier/anti-caking agent. Safety: Similar to INS 470a. Excess magnesium may cause diarrhea.

INS 471: Mono- and diglycerides of fatty acids (e.g., glyceryl monostearate) – Emulsifier. Safety: Widely approved (FDA/EFSA). Linked to processed foods; moderate intake advised.

INS 472a: Acetic acid esters of mono- and diglycerides – Emulsifier. Safety: EFSA-approved. No known bans. Safe at regulated levels.

INS 472b: Lactic acid esters of mono- and diglycerides – Emulsifier. Safety: GRAS (FDA). May contain traces of dairy; lactose-intolerant individuals should check labels.

INS 472c: Citric acid esters of mono- and diglycerides – Emulsifier. Safety: Approved globally. No health risks at typical doses.

INS 472d: Tartaric acid esters of mono- and diglycerides – Emulsifier. Safety: EFSA-approved. Safe for most; avoid if allergic to tartaric acid.

INS 472e: Diacetyltartaric acid esters of mono- and diglycerides – Emulsifier. Safety: Permitted in EU/US. May cause mild digestive issues in excess.

INS 472f: Mixed acetic and tartaric acid esters of mono- and diglycerides – Emulsifier. Safety: Similar to other 472-series additives. No bans reported.

INS 473: Sucrose esters of fatty acids – Emulsifier. Safety: Approved by EFSA/FDA. Safe for general use; may affect blood sugar in large amounts.

INS 474: Sucroglycerides – Emulsifier. Safety: EFSA-approved. No significant risks; commonly used in baked goods.

INS 475: Polyglycerol esters of fatty acids – Emulsifier. Safety: GRAS (FDA). EFSA notes no adverse effects. Avoid if sensitive to emulsifiers.

INS 476: Polyglycerol polyricinoleate – Emulsifier (common in chocolate). Safety: Approved by EFSA/FDA. May cause mild gastrointestinal effects.

INS 477: Propylene glycol esters of fatty acids – Emulsifier. Safety: FDA-approved. Propylene glycol may cause allergies in rare cases. Avoid if sensitive.

INS 478: Lactylated fatty acid esters of glycerol and propylene glycol – Emulsifier. Safety: Limited data; EFSA lists it as safe pending further study. Not banned.

INS 479b: Thermally oxidized soybean oil – Emulsifier. Safety: EFSA-approved. May contain oxidation byproducts; avoid if monitoring processed fats.

INS 480: Dioctyl sodium sulfosuccinate (DSS) – Emulsifier. Safety: FDA-approved as a stool softener; restricted in foods in some countries (e.g., EU). High doses may cause diarrhea.

INS 481: Sodium stearoyl lactylate – An emulsifier. Safety: Approved by FDA (GRAS) and EFSA. Safe at permitted levels; may cause mild digestive issues in excess.

INS 482: Calcium stearoyl lactylate – An emulsifier. Safety: Similar to INS 481. EFSA-approved. No significant risks reported.

INS 483: Stearyl tartarate – An emulsifier. Safety: Approved by EFSA. Limited data; generally recognized as safe. Avoid if allergic to tartaric acid.

INS 491: Sorbitan monostearate – An emulsifier. Safety: GRAS (FDA). EFSA considers it safe. May act as a laxative in high doses.

INS 492: Sorbitan tristearate – An emulsifier. Safety: Approved by EFSA/FDA. Similar safety profile to INS 491.

INS 493: Sorbitan monolaurate – An emulsifier. Safety: EFSA-approved. No known bans; safe for general use.

INS 494: Sorbitan monooleate – An emulsifier. Safety: GRAS (FDA). EFSA notes no adverse effects at permitted levels.

INS 495: Sorbitan monopalmitate – An emulsifier. Safety: Approved by EFSA/FDA. Safe for most; may cause bloating in sensitive individuals.

INS 500: Sodium carbonate/sodium bicarbonate (baking soda) – Mineral salt. Safety: GRAS (FDA). EFSA-approved. Excessive intake may disrupt acid-base balance.

INS 501: Potassium carbonate/potassium bicarbonate – Mineral salt. Safety: Approved globally. High doses may cause hyperkalemia (avoid with kidney disease).

INS 503: Ammonium carbonate/ammonium bicarbonate – Mineral salt. Safety: EFSA-approved. Releases ammonia; avoid in large quantities. Not banned.

INS 504: Magnesium carbonate – Anti-caking agent/mineral salt. Safety: GRAS (FDA). Excess may cause diarrhea. Safe for general use.

INS 507: Hydrochloric acid – Acidity regulator. Safety: Used in minimal quantities. EFSA/FDA-approved. Corrosive in pure form but safe in food processing.

INS 508: Potassium chloride – Mineral salt. Safety: GRAS (FDA). EFSA-approved. High intake may harm those with kidney/heart conditions.

INS 509: Calcium chloride – Mineral salt. Safety: Widely approved. Safe in moderation; excess may cause electrolyte imbalances.

INS 510: Ammonium chloride – Mineral salt. Safety: EFSA-approved. May affect blood pH in high doses; avoid in large amounts.

INS 511: Magnesium chloride – Mineral salt. Safety: GRAS (FDA). EFSA considers it safe. May act as a laxative.

INS 512: Stannous chloride – Color retention agent/antioxidant. Safety: FDA-approved in limited amounts. EFSA restricts use due to potential tin toxicity. Avoid excess.

INS 513: Sulfuric acid – Acidity regulator. Safety: Highly diluted use in foods. EFSA-approved. Corrosive in pure form; safe in trace amounts.

INS 514: Sodium sulfate – Mineral salt. Safety: GRAS (FDA). EFSA notes no risks at food-use levels. May cause laxative effects in excess.

INS 515: Potassium sulfate – Mineral salt/seasoning. Safety: Approved by EFSA/FDA. Monitor intake if potassium-restricted.

INS 516: Calcium sulfate – Flour treatment agent/mineral salt. Safety: GRAS (FDA). EFSA-approved. Safe for general use; may affect calcium balance if overconsumed.

INS 517: Ammonium sulfate - Mineral salt/improving agent. Safety: Approved by EFSA in limited quantities. May affect blood pH in high doses. Not banned but restricted in some foods.

INS 518: Magnesium sulfate (Epsom salts) - Mineral salt/acidity regulator. Safety: GRAS (FDA). EFSA-approved. Laxative effect in high doses; safe at food levels.

INS 519: Cupric sulfate - Mineral salt. Safety: FDA-approved in trace amounts. EFSA warns against excess copper intake (liver toxicity risk). Restricted in EU for some applications.

INS 520: Aluminium sulfate - Mineral salt. Safety: EFSA sets strict limits due to potential neurotoxicity. Avoid frequent consumption; not banned but controversial.

INS 521: Aluminium sodium sulfate - Mineral salt. Safety: Similar to INS 520. Restricted in some countries; potential aluminium accumulation concerns.

INS 522: Aluminium potassium sulfate - Mineral salt. Safety: EFSA recommends minimizing aluminium exposure. May affect nervous system with long-term high intake.

INS 523: Aluminium ammonium sulfate - Mineral salt. Safety: Same risks as other aluminium salts. Banned in some countries for certain uses.

INS 524: Sodium hydroxide - Mineral salt. Safety: GRAS (FDA) in minimal food processing amounts. Highly corrosive in pure form.

INS 525: Potassium hydroxide - Mineral salt. Safety: Similar to INS 524. EFSA-approved at low levels. May cause irritation in excess.

INS 526: Calcium hydroxide - Mineral salt. Safety: Widely approved (FDA/EFSA). Safe in moderation; may affect calcium balance.

INS 527: Ammonium hydroxide - Mineral salt. Safety: GRAS (FDA). EFSA notes no safety concerns at food-use levels.

INS 528: Magnesium hydroxide - Mineral salt. Safety: GRAS (FDA). Antacid properties; laxative effect in high doses.

INS 529: Calcium oxide - Mineral salt. Safety: EFSA-approved. Reacts with water; safe in processed foods.

INS 530: Magnesium oxide - Anti-caking agent. Safety: GRAS (FDA). EFSA considers it safe; may cause diarrhea in excess.

INS 535: Sodium ferrocyanide - Anti-caking agent. Safety: EFSA-approved with strict limits. Releases cyanide in acid but safe at permitted levels.

INS 536: Potassium ferrocyanide - Anti-caking agent. Safety: Similar to INS 535. Controversial but permitted in small amounts.

INS 538: Calcium ferrocyanide - Anti-caking agent. Safety: EFSA-approved with same precautions as other ferrocyanides.

INS 540: Dicalcium diphosphate - Anti-caking agent. Safety: GRAS (FDA). EFSA notes no risks at food levels.

INS 541: Sodium aluminium phosphate - Acidity regulator/emulsifier. Safety: EFSA restricts due to aluminium content. Avoid frequent consumption.

INS 542: Bone phosphate - Anti-caking agent. Safety: Derived from animal bones. Approved but avoided in vegetarian/vegan diets.

INS 544: Calcium polyphosphates - Anti-caking agent. Safety: EFSA-approved. May affect mineral absorption in excess.

INS 545: Ammonium polyphosphates - Anti-caking agent. Safety: Approved with limits. May disrupt phosphorus balance if overconsumed.

INS 551 (Silicon Dioxide): Description: Anti-caking agent used in powdered foods. Safety: Approved by FDA (GRAS), EFSA, and FSSAI. Generally recognized as safe; no significant health risks reported. Avoid excessive inhalation (occupational hazard).

INS 552 (Calcium Silicate): Description: Anti-caking agent in salt, spices, and baking powder. Safety: Approved globally (FDA, EFSA). Safe for consumption; no evidence of harm.

INS 553b (Talc): Description: Anti-caking agent in rice, chewing gum. Safety: EFSA and FDA permit limited use. Controversial due to potential asbestos contamination (banned in EU for certain uses). Avoid if ungraded.

INS 554 (Sodium Aluminosilicate): Description: Prevents clumping in powdered foods. Safety: Approved by FDA/EFSA but restricted in some countries (e.g., EU limits aluminum content). Linked to aluminum toxicity in high doses.

INS 555 (Potassium Aluminium Silicate): Description: Anti-caking agent. Safety: EFSA-approved. Aluminum exposure concerns; avoid excess intake (linked to neurological risks).

INS 570 (Stearic Acid): Description: Derived from fats; used in candies/oils. Safety: FDA GRAS, EFSA-safe. Naturally occurring; no health risks at approved levels.

INS 621 (Monosodium Glutamate - MSG): Description: Flavor enhancer in processed foods. Safety: FDA/EFSA deem it safe. Some individuals report "MSG syndrome" (headaches); no conclusive evidence of harm. Avoid if sensitive.

INS 627 (Disodium Guanylate): Description: Flavor enhancer (often in snacks). Safety: Approved but avoided by people with gout (purine content). EFSA sets safe limits.

INS 630 (Inosinic Acid): Description: Flavor enhancer. Safety: Safe per EFSA/FDA. Avoid with purine-related disorders (e.g., gout).

INS 632 (Dipotassium Inosinate): Description: Flavor enhancer (often in snacks). Safety: Approved by EFSA/FDA. Contains purines; avoid if sensitive to gout. Safe for general use within limits.

INS 633 (Calcium Inosinate): Description: Synergistic flavor enhancer. Safety: EFSA-approved. Purine content may affect gout patients. No risks for others at approved levels.

INS 634 (Calcium 5: Description: Enhances umami flavor. Safety: Permitted in EU/U.S. May contain purines; caution for gout. No toxicity reported otherwise.

INS 635 (Disodium 5: Description: Common in processed foods. Safety: Recognized as safe (FDA/EFSA). Purine-related risks for gout; otherwise low concern.

INS 636 (Maltol): Description: Sweet flavor enhancer. Safety: FDA GRAS; EFSA-approved. No adverse effects at typical doses. Overuse may cause nausea.

INS 637 (Ethyl Maltol): Description: Stronger than maltol; used in sweets. Safety: Safe per FDA/EFSA. High doses may cause headaches in sensitive individuals.

INS 640 (Glycine): Description: Amino acid; flavor modifier. Safety: Naturally occurring; FDA GRAS. No risks at food-grade levels.

INS 641 (L-Leucine): Description: Amino acid; flavor enhancer. Safety: Safe (EFSA/FDA). Excessive intake may imbalance amino acids but rare in food use.

INS 650 (Zinc Acetate): Description: Flavor enhancer/fortificant. Safety: EFSA limits zinc to avoid toxicity (nausea, copper deficiency). Approved in small doses.

INS 900 (Dimethylpolysiloxane): Description: Anti-foaming agent in oils/fried foods. Safety: FDA GRAS; EFSA-approved. No evidence of harm. Banned in organic foods (EU).

INS 901 (Beeswax): Description: Glazing agent (confectionery). Safety: Non-toxic; approved globally. Allergies rare (avoid if allergic to bee products).

INS 902 (Candelilla Wax): Description: Vegan glazing alternative. Safety: EFSA/FDA-approved. No known risks.

INS 903 (Carnauba Wax): Description: Plant-based coating for candies. Safety: FDA GRAS; EFSA deems it safe. Non-digestible; passes harmlessly.

INS 904 (Shellac): Description: Resin from insects; glossy coating. Safety: Approved but avoided by vegans. Rare allergies reported.

INS 905 (Paraffins): Description: Mineral oil-based glaze. Safety: Highly refined grades are FDA-approved. Potential contamination concerns; EU restricts non-food-grade forms.

INS 907 (Microcrystalline Wax): Description: Glazing agent. Safety: Refined forms approved by FDA. Not evaluated by EFSA; limited data. Avoid if unregulated.

INS 920 (L-Cysteine): Description: Dough conditioner (often from feathers/hair). Safety: EFSA/FDA-approved. Vegan concerns over sourcing. Safe chemically.

INS 924 (Potassium Bromate): Description: Flour improver. Safety: Banned in EU, India, and Canada (carcinogenic). FDA allows it with restrictions (California requires warning labels). Avoid.

INS 925 (Chlorine): Description: Flour bleaching agent. Safety: FDA-approved; forms harmless byproducts. Banned in EU. Potential respiratory irritant in pure form.

INS 926 (Chlorine Dioxide): Description: Flour treatment. Safety: FDA-approved; decomposes to safe residues. EU bans it due to insufficient data.

INS 928 (Benzoyl Peroxide): Description: Flour bleaching agent. Safety: Banned in EU/China (potential carcinogen). FDA permits it in limited doses. Linked to hyperactivity in sensitive individuals.

INS 938 (Argon): Description: Inert propellant. Safety: EFSA/FDA-approved. Non-toxic; no health risks.

INS 939 (Helium): Description: Propellant (e.g., whipped cream). Safety: Safe (chemically inert). Risk only if inhaled directly (asphyxiation).

INS 941 (Nitrogen): Description: Inert propellant (e.g., in packaged snacks). Safety: Non-toxic; approved globally (EFSA/FDA). No health risks.

INS 942 (Nitrous Oxide): Description: Propellant (whipped cream). Safety: Safe in food use (FDA/EFSA). Occupational inhalation risks (not food-related).

INS 943a (Butane): Description: Propellant (cooking sprays). Safety: EFSA-approved. Highly flammable; food-grade use is safe. Avoid direct inhalation.

INS 943b (Isobutane): Description: Propellant (similar to butane). Safety: EFSA-approved. Low toxicity; flammable in pure form. Safe in food applications.

INS 950 (Acesulfame Potassium): Description: Artificial sweetener (200× sweeter than sugar). Safety: FDA GRAS; EFSA-approved. No carcinogenicity evidence. Avoid in phenylketonuria

(PKU) due to potassium content.

INS 951 (Aspartame): Description: Low-calorie sweetener. Safety: FDA/EFSA deem it safe. Controversial: Linked to headaches in sensitive individuals. Banned in some countries for PKU risk (contains phenylalanine).

INS 952 (Cyclamates): Description: Sweetener (30× sweeter than sugar). Safety: Banned in the U.S. (FDA, 1969) due to carcinogenicity concerns. Permitted in EU with strict limits. Avoid.

INS 953 (Isomalt): Description: Sugar substitute (low glycemic index). Safety: EFSA/FDA-approved. May cause digestive issues (bloating) in excess.

INS 954 (Saccharin): Description: Oldest artificial sweetener. Safety: FDA removed cancer warnings (2000); EFSA-approved. Linked to bladder cancer in rats (irrelevant to humans).

INS 955 (Sucralose): Description: Chlorinated sugar (600× sweeter). Safety: FDA/EFSA-approved. Heat-stable; no evidence of harm. Debated impact on gut microbiota (inconclusive).

INS 956 (Alitame): Description: High-potency sweetener. Safety: Approved in few countries (not EU/U.S.). Limited data; avoid pending further research.

INS 957 (Thaumatin): Description: Natural sweetener (protein-based). Safety: EFSA/FDA GRAS. Allergies rare. Safe for general use.

INS 959 (Neohesperidin Dihydrochalcone): Description: Citrus-derived sweetener. Safety: EFSA-approved. No toxicity risks. May interact with medications (limited data).

INS 965 (Maltitol): Description: Sugar alcohol (bulk sweetener). Safety: FDA/EFSA-approved. Laxative effect in high doses; safe for diabetics.

INS 966 (Lactitol): Description: Sugar alcohol (dairy-derived). Safety: EFSA-approved. May cause bloating; safe for lactose-intolerant individuals.

INS 967 (Xylitol): Description: Tooth-friendly sweetener. Safety: Safe (EFSA/FDA). Toxic to dogs; causes hypoglycemia. Human use is beneficial for dental health.

INS 999 (Quillaia Extract): Description: Foaming agent (beverages). Safety: EFSA-approved with limits. High doses may irritate mucous membranes. Avoid in unregulated products.

INS 1001 (Choline Salts): Description: Emulsifier/nutrient. Safety: Essential nutrient; FDA GRAS. Excess intake linked to fishy body odor (trimethylamine).

INS 1100 (Amylases): Description: Extracted from fungi or bacteria, used as a flour treatment agent. Safety: Generally recognized as safe (GRAS) by FDA; no known health risks. EFSA and WHO confirm safety for general use.

INS 1102 (Glucose Oxidase): Description: Antioxidant derived from fungi. Safety: Approved by FDA/EFSA; no significant risks reported. May cause mild allergies in rare cases.

INS 1103 (Invertase): Description: Enzyme breaking down sucrose. Safety: Safe (EFSA/FDA), but lack of long-term studies. Not banned.

INS 1104 (Lipases): Description: Flavor enhancer from animal/plant sources. Safety: GRAS (FDA); safe for most. Avoid if allergic to enzyme sources.

INS 1105 (Lysozyme): Description: Preservative (egg-derived). Safety: Safe (EFSA), but avoid with egg allergies. No bans.

INS 1200 (Polydextrose): Description: Humectant/soluble fiber. Safety: FDA/EFSA-approved; may cause bloating in excess. Safe for diabetics.

INS 1201 (Polyvinylpyrrolidone): Description: Binder/stabilizer. Safety: Limited data; FDA permits use but restricted in EU (EFSA). Avoid if sensitive.

INS 1202 (Polyvinylpolypyrrolidone): Description: Color stabilizer. Safety: Approved (FDA) but banned in EU (EFSA) due to insufficient data.

INS 1400-1451 (Starch Derivatives): Description: Thickeners (e.g., acetylated starch). Safety: All GRAS (FDA); EFSA notes safety but limits some (e.g., INS 1442) for children.

INS 1505 (Triethyl Citrate): Description: Emulsifier. Safety: Safe (FDA/EFSA); no risks at approved levels.

INS 1510 (Ethanol): Description: Solvent (not additive). Safety: Safe in trace amounts; avoid in alcohol-sensitive products.

INS 1518 (Triacetin): Description: Humectant. Safety: GRAS (FDA); no known risks.

INS 1520 (Propylene Glycol): Description: Humectant. Safety: FDA-approved; EFSA sets limits (may cause irritation in excess).

INS 1521 (Polyethylene Glycol): Description: Antifoaming agent. Safety: Restricted in EU (EFSA); FDA permits use with limits. Avoid prolonged exposure.