Professional Certificate in Nutrition for Hormonal Balance

Nutrition for Hormonal Acne

Acne – A skin condition characterized by clogged pores, inflammation, and lesions.
Related terms: comedones, papules, cysts.
Explanation: Hormonal acne is driven by fluctuations in androgens that increase sebum production and alter keratinization.
Example: A 22-year-old woman experiences breakouts during her luteal phase.
Practical application: Track flare patterns with a diary to correlate dietary triggers.
Challenges: Differentiating hormonal acne from bacterial or stress-related types can be difficult without clinical assessment.

Androgen – Steroid hormones that regulate male characteristics and influence sebum output.
Related terms: testosterone, DHEA, SHBG.
Explanation: Elevated androgen levels or increased receptor sensitivity stimulate the sebaceous glands, creating an environment conducive to acne.
Example: Polycystic ovary syndrome (PCOS) often presents with hyperandrogenism and persistent acne.
Practical application: Nutritional strategies that lower circulating androgens, such as high-fiber diets, may reduce lesion frequency.
Challenges: Hormone levels fluctuate daily; dietary impact may be modest and requires consistent monitoring.

Anti-Inflammatory Diet – Eating pattern rich in foods that modulate inflammatory pathways.
Related terms: omega-3 fatty acids, polyphenols, glycemic load.
Explanation: Reducing systemic inflammation can diminish the inflammatory cascade that exacerbates acne lesions.
Example: Incorporating salmon, walnuts, berries, and leafy greens three times weekly.
Practical application: Use the “rainbow” rule—consume at least five different colored vegetables daily to maximize antioxidant intake.
Challenges: Patient adherence may wane if meals become repetitive; cultural food preferences must be respected.

Arginine – A conditionally essential amino acid involved in nitric oxide synthesis.
Related terms: protein, vascular tone, collagen.
Explanation: While arginine supports skin healing, excess intake from certain nuts may increase insulin-like growth factor-1 (IGF-1), a known acne promoter.
Example: A diet high in peanuts and almonds could elevate IGF-1 levels.
Practical application: Balance arginine-rich foods with those high in lysine (e.g., legumes) to maintain a favorable arginine/lysine ratio.
Challenges: Nutrient-dense foods like nuts have health benefits; eliminating them may reduce overall diet quality.

Ashwagandha – An adaptogenic herb (Withania somnifera) used to modulate stress hormones.
Related terms: cortisol, adaptogen, HPA axis.
Explanation: Chronic stress raises cortisol, which can trigger androgen production and worsen acne; ashwagandha may blunt this response.
Example: Taking 300 mg of standardized extract daily for eight weeks reduced perceived stress scores in a pilot study.
Practical application: Recommend a low-dose supplement alongside a whole-food diet to avoid reliance on isolated extracts.
Challenges: Limited high-quality research on acne outcomes; potential herb-drug interactions must be screened.

Beta-Carotene – A provitamin A carotenoid found in orange and green vegetables.
Related terms: retinol, antioxidant, immune function.
Explanation: Beta-carotene converts to retinol, supporting epidermal differentiation and reducing hyperkeratinization that blocks pores.
Example: Sweet potato consumption (½ cup) provides ~4 mg of beta-carotene, meeting 50 % of the recommended intake.
Practical application: Encourage patients to include a variety of colored vegetables at each meal.
Challenges: Excessive supplementation may cause carotenemia; dietary sources are preferred.

Biotin – A B-complex vitamin (B7) involved in fatty-acid synthesis and skin health.
Related terms: keratin, hair growth, metabolism.
Explanation: While biotin deficiency can cause dermatitis, over-supplementation may mask other deficiencies and interfere with lab assays for thyroid function.
Example: High-dose biotin (>5 mg) is popular for nail health but offers no proven acne benefit.
Practical application: Advise patients to obtain biotin from eggs, nuts, and legumes rather than mega-doses.
Challenges: Misconception that “more is better” leads to unnecessary supplementation.

Blood Sugar Index (BSI) – A composite measure of glycemic impact considering both glucose and insulin responses.
Related terms: glycemic load, insulin resistance, post-prandial spike.
Explanation: High BSI foods raise insulin and IGF-1, both of which stimulate sebaceous activity and keratinocyte proliferation.
Example: White bread has a BSI of 85, while whole-grain rye scores 45.
Practical application: Teach clients to choose low-BSI options (e.g., steel-cut oats, legumes) to stabilize hormone levels.
Challenges: Accurate BSI data are limited for many ethnic foods; reliance on generic tables may mislead.

Branched-Chain Amino Acids (BCAAs) – Leucine, isoleucine, and valine, essential for muscle protein synthesis.
Related terms: muscle recovery, mTOR pathway, insulin signaling.
Explanation: Excessive BCAA intake, especially from whey protein powders, can activate mTOR and increase IGF-1, potentially aggravating acne.

Example: A post-workout shake containing 20 g of BCAAs may elevate IGF-1 for several hours.
Practical application: Recommend whole-food protein sources (e.g., fish, poultry) and limit isolated BCAA supplements for acne-prone clients.
Challenges: Athletes may feel performance is compromised without supplements; individualized counseling is essential.

Calcium-Rich Foods – Foods high in calcium, such as dairy, fortified plant milks, and leafy greens.
Related terms: lactose, casein, bone health.
Explanation: Dairy provides both calcium and bioactive peptides that can increase insulin and IGF-1; the net acne effect varies by individual tolerance.
Example: Yogurt consumption (1 cup) delivers ~300 mg calcium plus probiotic cultures.
Practical application: Substitute dairy with calcium-fortified almond or soy milk while monitoring acne response.
Challenges: Ensuring adequate calcium intake without dairy may require supplementation, which must be balanced against cost and preference.

Caprylic Acid – An eight-carbon medium-chain fatty acid with antimicrobial properties.
Related terms: MCT oil, antifungal, skin barrier.
Explanation: Topical application can reduce Cutibacterium acnes colonization, but oral ingestion influences gut microbiota rather than skin directly.
Example: A 5 % caprylic acid cream applied twice daily reduced bacterial load in a small trial.
Practical application: Recommend a probiotic-rich diet (e.g., kefir) alongside topical agents for a synergistic effect.
Challenges: Oral MCT oils may cause gastrointestinal upset; patients must be screened for tolerance.

Carbohydrate Quality – The nutritional value of carbs based on fiber, micronutrients, and glycemic impact.
Related terms: refined grains, whole grains, glycemic index.
Explanation: High-quality carbs (whole grains, legumes) produce slower glucose excursions, minimizing insulin spikes that drive acne.
Example: Replacing white rice with quinoa reduces post-meal glucose by ~20 %.
Practical application: Create meal plans emphasizing low-glycemic, high-fiber options.
Challenges: Accessibility and cost of whole-grain products can limit adherence in low-income settings.

Casein – A phosphoprotein found in milk and dairy products.
Related terms: whey, milk protein, bioactive peptides.
Explanation: Casein releases peptides that may increase IGF-1 and mTOR activity, potentially worsening acne in sensitive individuals.
Example: Consuming a cheese snack (30 g) delivers ~8 g casein.
Practical application: Suggest dairy-free alternatives (e.g., pea protein) for patients who report flare-ups after cheese consumption.
Challenges: Dairy provides calcium and vitamin D; removing it without proper substitution may affect bone health.

Cholesterol – A sterol essential for cell membrane integrity and hormone synthesis.

Related terms: lipoproteins, HDL, LDL.
Explanation: While necessary, excessive dietary cholesterol from processed meats can increase systemic inflammation, indirectly influencing acne.
Example: A typical fast-food burger contains ~70 mg cholesterol.
Practical application: Encourage lean protein sources (e.g., poultry, fish) and limit processed meats.
Challenges: Cultural dietary patterns may include frequent high-cholesterol foods; behavior change strategies are needed.

Cinnamon – A spice containing cinnamaldehyde, known for insulin-sensitizing effects.
Related terms: glycemic control, anti-oxidant, spice.
Explanation: By improving insulin sensitivity, cinnamon may reduce IGF-1-mediated sebum production.
Example: Adding ½ tsp of Ceylon cinnamon to oatmeal daily lowered post-prandial glucose in a small study.
Practical application: Incorporate cinnamon into breakfast dishes or smoothies as a flavor enhancer.
Challenges: Overuse can cause liver toxicity due to coumarin; recommend Ceylon (low coumarin) varieties.

Collagen Peptides – Hydrolyzed protein fragments derived from animal connective tissue.
Related terms: gelatin, skin elasticity, amino acids.
Explanation: Collagen supplementation provides glycine and proline, supporting dermal matrix repair, but does not directly address hormonal pathways.
Example: A 10-g serving of collagen powder mixed into coffee provides ~3 g protein.
Practical application: Suggest collagen as an adjunct for skin healing after acne lesions have cleared.
Challenges: Source (bovine vs. marine) may conflict with dietary restrictions; quality varies among brands.

Conjugated Linoleic Acid (CLA) – A group of linoleic acid isomers found in ruminant meat and dairy.
Related terms: fatty acids, body composition, oxidative stress.
Explanation: CLA may modestly improve insulin sensitivity, yet high dairy intake associated with CLA could still raise IGF-1 levels.
Example: Grass-fed beef contains ~0.1 % CLA by weight.
Practical application: Advise patients to obtain CLA from modest portions of grass-fed meat while monitoring acne response.
Challenges: Balancing the potential metabolic benefit against the risk of dairy-related acne flare.

Crude Fiber – The indigestible portion of plant foods measured by traditional methods.
Related terms: soluble fiber, insoluble fiber, prebiotic.
Explanation: Fiber binds bile acids, reduces cholesterol, and attenuates post-prandial glucose spikes, thereby limiting insulin-driven acne pathways.
Example: One cup of cooked lentils provides ~15 g crude fiber.
Practical application: Incorporate legumes, whole grains, and vegetables to achieve ≥25 g daily fiber.
Challenges: Sudden high fiber intake may cause bloating; increase gradually and ensure adequate hydration.

Cysteine – A sulfur-containing amino acid important for keratin formation.
Related terms: glutathione, detoxification, hair.
Explanation: Adequate cysteine supports skin barrier integrity, potentially reducing transepidermal water

loss that can exacerbate inflammation.
Example: Eggs and poultry are rich sources (~200 mg per 100 g).
Practical application: Include cysteine-rich foods in meals; avoid excessive supplementation without professional guidance.
Challenges: Over-reliance on animal sources may conflict with plant-based preferences.

Dark Chocolate – Cocoa product containing flavonoids and varying amounts of sugar and dairy.
Related terms: antioxidants, glycemic load, fatty acids.
Explanation: The flavonoids may reduce inflammation, but added sugars and dairy can raise IGF-1, making the net effect individual-dependent.
Example: A 30-g bar with 70 % cocoa and low sugar may be tolerated better than milk chocolate.
Practical application: Recommend low-sugar, high-cocoa options and limit portion size to ≤20 g.
Challenges: Patient cravings for sweet foods may lead to overconsumption; behavioral strategies are needed.

Decarboxylated THC – Not directly related to nutrition; omitted to maintain relevance.

Dietary Sodium – Mineral essential for fluid balance; excess can promote edema and skin swelling.
Related terms: blood pressure, processed foods, electrolytes.
Explanation: High sodium intake may exacerbate inflammatory pathways and impair skin barrier function.
Example: A single serving of processed cheese can contain ~400 mg sodium.
Practical application: Encourage cooking from scratch with herbs and spices to reduce reliance on salty condiments.
Challenges: Taste preferences for salty foods are entrenched; gradual reduction strategies improve compliance.

EGCG (Epigallocatechin Gallate) – A catechin abundant in green tea with potent antioxidant activity.
Related terms: polyphenols, anti-oxidant, skin health.
Explanation: EGCG inhibits lipogenesis in sebocytes and reduces inflammatory cytokine production, offering a topical and systemic benefit for acne.
Example: Consuming 2–3 cups of brewed green tea provides ~200 mg EGCG.
Practical application: Suggest daily green tea intake and consider EGCG-rich extracts under professional supervision.
Challenges: High doses may affect liver enzymes; monitor patients with pre-existing hepatic conditions.

Elimination Diet – Structured removal of potential trigger foods followed by systematic reintroduction.
Related terms: food sensitivity, challenge phase, nutrient adequacy.
Explanation: Identifies specific foods that aggravate hormonal acne, allowing personalized dietary modifications.
Example: A 4-week protocol removing dairy, gluten, and high-glycemic carbs, then re-adding each group every 7 days.
Practical application: Provide a detailed food log template and ensure supplementation of missing nutrients during restriction phases.
Challenges: Time-intensive; risk of unnecessary restriction if not guided by a qualified professional.

Ellagic Acid – A polyphenol found in berries, nuts, and pomegranates.
Related terms: antioxidant, detoxification, anti-inflammatory.
Explanation: May inhibit NF-κB signaling, decreasing inflammatory mediator release in acne lesions.
Example: One cup of raspberries supplies ~30 mg ellagic acid.
Practical application: Encourage inclusion of berries in breakfast bowls or smoothies.
Challenges: Seasonal availability can limit consistent intake; frozen options preserve polyphenol content.

Essential Fatty Acids (EFAs) – Omega-3 and omega-6 fatty acids required for cell membrane fluidity and eicosanoid production.
Related terms: LA, ALA, EPA/DHA.
Explanation: An optimal omega-6:omega-3 ratio (≈4:1) reduces pro-inflammatory eicosanoids, thereby lowering acne severity.
Example: Flaxseed oil (1 tbsp) provides ~7 g ALA, while soybean oil (1 tbsp) supplies ~7 g linoleic acid.
Practical application: Advise patients to replace some omega-6-rich oils with omega-3 sources like fish, chia, or hemp seeds.
Challenges: Balancing intake without compromising essential omega-6 for skin barrier function.

Fermented Foods – Foods produced through microbial action, such as kimchi, sauerkraut, and kefir.
Related terms: probiotics, postbiotics, gut-skin axis.
Explanation: Modulate gut microbiota, which influences systemic inflammation and hormonal regulation; a healthier microbiome can lessen acne flare-ups.
Example: A 150-ml serving of kefir delivers ~10 billion CFU.
Practical application: Incorporate a serving of fermented vegetables or dairy daily.
Challenges: Some fermented products contain added sugars; choose low-sugar varieties.

Flavonoids – A diverse group of plant compounds with antioxidant and anti-inflammatory properties.
Related terms: quercetin, anthocyanins, bioavailability.
Explanation: Flavonoids can inhibit 5-α-reductase activity, reducing conversion of testosterone to dihydrotestosterone (DHT), a potent androgen in sebaceous glands.
Example: One medium onion provides ~30 mg quercetin.
Practical application: Suggest regular consumption of onions, apples, and berries to boost flavonoid intake.
Challenges: Bioavailability varies; pairing with fat can enhance absorption.

Food Glycation End-Products (AGEs) – Compounds formed when proteins or lipids react with sugars during cooking.
Related terms: oxidative stress, inflammation, dietary sources.
Explanation: Dietary AGEs can increase systemic oxidative stress, aggravating skin inflammation and acne.
Example: Grilled chicken skin contains higher AGE levels than boiled chicken.
Practical application: Recommend low-temperature cooking methods (steaming, poaching) and avoid charring.
Challenges: Cultural cooking practices often involve high-heat techniques; education on alternative methods is needed.

Gamma-Linolenic Acid (GLA) – An omega-6 fatty acid found in borage oil, evening-primrose oil, and black

currant seed oil.
Related terms: anti-inflammatory, eicosanoids, skin barrier.
Explanation: GLA converts to dihomo-γ-linolenic acid, which can produce anti-inflammatory prostaglandins, potentially reducing acne lesions.
Example: Evening-primrose oil capsules (500 mg) supply ~10 % GLA.
Practical application: Use GLA oils as adjuncts for patients intolerant to fish oil.
Challenges: Cost and potential for oil oxidation; store in dark, cool places and advise limited shelf life.

Glycemic Index (GI) – A ranking of carbohydrate foods based on their effect on blood glucose levels.
Related terms: post-prandial glucose, insulin response, low-GI diet.
Explanation: High-GI foods provoke rapid insulin spikes, elevating IGF-1 and promoting sebum production; low-GI choices stabilize hormonal milieu.
Example: White rice GI ≈73; quinoa GI ≈53.
Practical application: Teach patients to pair high-GI carbs with protein/fat to blunt glucose excursions.
Challenges: GI values can differ based on ripeness, cooking method, and individual metabolism.

Glutathione – A tripeptide antioxidant critical for cellular detoxification.
Related terms: oxidative stress, vitamin C, skin brightening.
Explanation: Elevated oxidative stress in acne lesions depletes glutathione; supporting its synthesis may aid recovery.
Example: Selenium (found in Brazil nuts) and vitamin C are cofactors for glutathione regeneration.
Practical application: Recommend a diet rich in selenium, vitamin C, and protein to sustain glutathione levels.
Challenges: Excess selenium can be toxic; advise limited intake (1–2 Brazil nuts per day).

Gluten – A composite of storage proteins (gliadin and glutenin) found in wheat, barley, and rye.
Related terms: celiac disease, non-celiac gluten sensitivity, cross-reactivity.
Explanation: In some individuals, gluten may provoke systemic inflammation, indirectly influencing acne; evidence is not universal.
Example: A patient reporting flare-ups after consuming pasta may benefit from a trial gluten-free period.
Practical application: Conduct an elimination phase of gluten for 3–4 weeks while monitoring skin changes.
Challenges: Removing gluten without compromising fiber intake requires careful substitution (e.g., quinoa, buckwheat).

Glucose-Stimulated Insulin Secretion (GSIS) – The pancreatic response to rising blood glucose.
Related terms: beta cells, hyperinsulinemia, IGF-1.
Explanation: Repeated GSIS from high-glycemic meals sustains elevated insulin, which up-regulates androgen production and sebaceous activity.
Example: A sugary breakfast can cause a 2-fold insulin rise within 30 minutes.
Practical application: Advise patients to start the day with protein and healthy fats to attenuate GSIS.
Challenges: Lifestyle constraints (e.g., limited time) may lead to reliance on quick-carb options; education on portable balanced meals is vital.

Green Tea Extract – Concentrated preparation of Camellia sinensis leaves.

Related terms: EGCG, polyphenols, topical formulation.
Explanation: Standardized extracts (≥50 % EGCG) have been shown to reduce acne lesion counts via anti-inflammatory and anti-androgenic mechanisms.
Example: A 250-mg capsule taken twice daily provides ~100 mg EGCG.
Practical application: Combine oral supplementation with a topical green-tea-based serum for synergistic effect.
Challenges: Potential interaction with anticoagulant medications; screen patient medication list.

Gut-Skin Axis – The bidirectional communication pathway between intestinal microbiota and skin health.
Related terms: microbiome, immune modulation, short-chain fatty acids.
Explanation: Dysbiosis can increase systemic inflammation and alter hormonal metabolism, contributing to acne development.
Example: Low diversity of Bifidobacterium correlates with higher acne severity scores.
Practical application: Recommend prebiotic fiber (e.g., inulin) and probiotic foods to restore balance.
Challenges: Individual microbiome responses vary; personalized testing may be required for optimal outcomes.

HCA (Hydroxycitric Acid) – A compound extracted from Garcinia cambogia fruit.
Related terms: lipogenesis inhibition, appetite suppression, weight management.
Explanation: By reducing de novo fatty acid synthesis, HCA may indirectly lower sebum production, though evidence specific to acne is limited.
Example: A 500-mg HCA supplement taken before meals was studied for weight loss.
Practical application: Use HCA only when weight management is a co-goal; prioritize whole-food approaches.
Challenges: Safety concerns regarding liver toxicity; avoid high-dose or prolonged use.

Hair-Follicle Sebaceous Unit – The anatomical complex comprising the hair shaft, follicle, and associated oil gland.
Related terms: pilosebaceous unit, keratinocyte, sebocyte.
Explanation: Hormonal signals target this unit, dictating sebum output and keratin turnover; understanding its biology guides nutritional interventions.
Example: Androgens bind receptors on sebocytes, stimulating lipid synthesis.
Practical application: Nutrients that modulate hormone receptors (e.g., zinc) can influence unit activity.
Challenges: Genetic predisposition determines unit size and responsiveness; nutrition alone may not fully control severe cases.

Hyaluronic Acid (HA) – A glycosaminoglycan that retains water in the extracellular matrix.
Related terms: hydration, skin plumpness, wound healing.
Explanation: While HA does not affect hormonal pathways, topical HA supports barrier repair after acne lesions, reducing post-inflammatory hyperpigmentation.
Example: A 2 % HA serum applied twice daily improves skin moisture.
Practical application: Pair HA with anti-inflammatory agents to enhance recovery.
Challenges: HA alone cannot prevent new lesions; must be part of a comprehensive plan.

IgG Food Sensitivity – Antibody-mediated response to specific food proteins measured by serum testing.
Related terms: immune response, elimination diet, cross-reactivity.
Explanation: Some patients with hormonal acne show elevated IgG to dairy or wheat, suggesting an immune component that may exacerbate inflammation.
Example: A panel indicating high IgG to whey protein may guide dietary exclusion.
Practical application: Use IgG results to tailor an elimination protocol, then re-challenge to confirm relevance.
Challenges: Clinical validity of IgG testing is debated; results should be interpreted with caution.

IGF-1 (Insulin-Like Growth Factor-1) – A peptide hormone stimulated by insulin and nutrition, promoting cell proliferation.
Related terms: growth hormone, sebum production, mTOR.
Explanation: Elevated IGF-1 enhances keratinocyte growth and sebum synthesis, key drivers of acne pathogenesis.
Example: Dairy protein intake can raise IGF-1 concentrations by 10–15 % in a few hours.
Practical application: Advise low-IGF-1 diets (reduced dairy, low-glycemic carbs) for acne-prone individuals.
Challenges: IGF-1 is essential for growth and tissue repair; overly restrictive diets may impair overall health.

Inositol – A cyclitol involved in cell signaling, particularly in insulin pathways.
Related terms: myo-inositol, PCOS, glucose metabolism.
Explanation: Supplementation can improve insulin sensitivity in PCOS, indirectly lowering androgen-driven acne.
Example: 2 g of myo-inositol twice daily improved ovulatory function in a clinical trial.
Practical application: Recommend inositol for patients with both PCOS and acne after evaluating baseline labs.
Challenges: Response varies; monitor for gastrointestinal upset at high doses.

Iron – A mineral essential for oxygen transport and enzymatic reactions.
Related terms: hemoglobin, oxidative stress, anemia.
Explanation: Iron deficiency can impair skin healing and increase oxidative stress, potentially worsening acne scarring.
Example: A 30-year-old female with ferritin 12 ng/mL may benefit from iron-rich foods.
Practical application: Incorporate heme (red meat) and non-heme (lentils, spinach) sources, paired with vitamin C for absorption.
Challenges: Excess iron can catalyze free-radical formation; balance intake carefully.

Isoflavones – Phytoestrogens found in soybeans and legumes.
Related terms: genistein, daidzein, estrogen receptor.
Explanation: Isoflavones can exert mild estrogenic effects, potentially modulating androgen activity and reducing sebum output.
Example: One cup of edamame provides ~30 mg isoflavones.
Practical application: Suggest moderate soy intake as part of a balanced diet for patients seeking plant-based estrogenic support.

Challenges: Some individuals experience gastrointestinal discomfort; monitor tolerance.

Jojoba Oil – A liquid wax ester resembling human sebum.
Related terms: topical application, non-comedogenic, skin barrier.
Explanation: When applied, jojoba can help regulate sebum production by providing a "mock" sebum layer, reducing the skin's urge to overproduce oil.
Example: A few drops massaged onto the face each morning.
Practical application: Recommend as a carrier oil for acne-targeted serums.
Challenges: Not a dietary intervention; must be combined with internal nutrition strategies for comprehensive care.

Keto-Adapted Diet – A low-carbohydrate, high-fat eating pattern that induces ketosis.
Related terms: ketone bodies, insulin reduction, macronutrient shift.
Explanation: By drastically lowering insulin spikes, a ketogenic diet may reduce IGF-1 and androgen-driven sebum production; however, high saturated fat can increase systemic inflammation if food quality is poor.
Example: A typical day of eggs, avocado, and leafy greens with Kojic Acid – A fungal metabolite used in skin-lightening products.
Related terms: melanin inhibition, post-inflammatory hyperpigmentation, topical agent.
Explanation: While not a nutritional component, kojic acid can address acne-related hyperpigmentation, complementing dietary strategies.
Example: A 1 % kojic acid serum applied nightly reduces dark spots.
Practical application: Pair with nutritional antioxidants (vitamin C) for synergistic brightening.
Challenges: Potential for contact dermatitis; patch testing is essential.

Lactoferrin – An iron-binding glycoprotein abundant in colostrum and whey.
Related terms: immune modulation, antimicrobial, skin barrier.
Explanation: Lactoferrin can inhibit Cutibacterium acnes growth and modulate inflammatory cytokines, offering a dual nutritional and topical benefit.
Example: A fortified yogurt containing 100 mg lactoferrin per serving.
Practical application: Include lactoferrin-enriched dairy or supplement under professional guidance.
Challenges: Lactose intolerance may limit dairy sources; hypoallergenic alternatives are limited.

Low-Glycemic Load (LGL) Diet – Eating plan focusing on total carbohydrate impact rather than individual GI.
Related terms: net carbs, portion control, satiety.
Explanation: By reducing overall glycemic load, insulin and IGF-1 responses are moderated, decreasing androgenic stimulation of sebaceous glands.
Example: 150 g of cooked quinoa (GL ≈ 12) versus 150 g of white rice (GL ≈ 28).
Practical application: Use food-tracking apps to calculate daily GL and aim for ≤120.
Challenges: Accurate GL values for mixed dishes are scarce; education on estimating portions is required.

Lycopene – A carotenoid giving tomatoes and watermelon their red hue.
Related terms: antioxidant, photoprotection, skin health.
Explanation: Lycopene reduces oxidative stress and may inhibit 5-α-reductase, lowering DHT formation in the skin.

Example: A cup of cooked tomatoes provides ~20 mg lycopene.
Practical application: Encourage consumption of cooked tomato sauces to enhance lycopene bioavailability.
Challenges: Heat can degrade some nutrients; pairing with healthy fats improves absorption.

Magnesium – A mineral involved in over 300 enzymatic reactions, including hormone synthesis.
Related terms: stress reduction, muscle relaxation, sleep quality.
Explanation: Magnesium deficiency can elevate cortisol, indirectly increasing androgen levels; adequate intake supports hormonal balance.
Example: One ounce of pumpkin seeds supplies ~150 mg magnesium.
Practical application: Recommend magnesium-rich snacks and consider a 200-mg supplement if dietary intake is low.
Challenges: High doses may cause diarrhea; split dosing throughout the day.

Manganese – A trace mineral co-factor for antioxidant enzymes such as superoxide dismutase.
Related terms: bone formation, metabolism, free radicals.
Explanation: Adequate manganese supports skin's oxidative defense mechanisms, reducing inflammation associated with acne lesions.
Example: One cup of pineapple provides ~1.5 mg manganese.
Practical application: Include whole grains, nuts, and fruits to meet the RDI (≈2 mg).
Challenges: Over-supplementation can interfere with copper absorption; balance is key.

Marjoram – An aromatic herb (Origanum majorana) with mild anti-inflammatory properties.
Related terms: essential oil, herbal tea, stress relief.
Explanation: Marjoram tea may lower cortisol, indirectly reducing androgen surge; evidence is limited but anecdotal reports are positive.
Example: Steeping 1 tsp dried marjoram in hot water for 10 minutes.
Practical application: Offer as a calming bedtime beverage for patients experiencing stress-related breakouts.
Challenges: Potential allergic reactions in herb-sensitive individuals; advise a patch test.

Melatonin – A hormone regulating circadian rhythms, also possessing antioxidant activity.
Related terms: sleep, oxidative stress, immune modulation.
Explanation: Adequate sleep improves skin repair and reduces cortisol, indirectly benefiting hormonal acne. Dietary sources are limited; supplementation may aid those with sleep disturbances.
Example: 3 mg melatonin taken 30 minutes before bedtime.
Practical application: Counsel on sleep hygiene alongside nutrition for holistic acne management.
Challenges: Timing and dosage must be individualized; excessive melatonin can cause daytime drowsiness.

Methylsulfonylmethane (MSM) – An organosulfur compound with anti-inflammatory effects.
Related terms: joint health, keratin, detoxification.
Explanation: MSM may reduce inflammatory cytokines in acne lesions and improve skin elasticity.
Example: 1 g MSM powder mixed into a smoothie daily.
Practical application: Use MSM as an adjunct for patients with persistent inflammation despite dietary