

Spice for Life

SELF-HEALING RECIPES,
REMEDIES AND RESEARCH

Dr. Ed Bauman and Shiela Moorthy
Preface by Donnie Yance

Spice for Life

SELF-HEALING RECIPES, REMEDIES AND RESEARCH

"Spice for Life is not only beautiful in its design and text, but it's organization far exceeds standard nutritional books. Dr. Bauman and Sheila Moorthy have placed each spice/herb in its own comprehensive section which includes lore, clinical studies, medicinal formulas, recipes, and propagation. This template is used for each herb which makes the book easy to reference and easily "digested." The combination of science, traditional uses and colloquial material makes the book remarkably informative, comprehensive and fun."

Armand Brint, Founder, Berkeley Holistic Health Center, former Poet Laureate, Ukiah, CA

Enthusiastic Praise for Spice for Life

“Ed and Shiela open a door to this fascinating world of herbs and spices and show how they can be delightfully integrated into our mainstream diet. For our spiritual progress as much as anything else, it is mandatory to find nourishment in a well-balanced way. This is more than a recipe book: it is an essential guide to holistic eating.”

— James Anderson, Coordinating Editor NAMA, the *Journal for Integral Health*, Pondicherry, India

“Have you ever visited an old and treasured friend and discovered something bright and new? *Spice for Life* does just that. It brings me back to earlier years when exploring herbs for healing brought purpose and pleasure — and refreshes the feast. Ed Bauman and Shiela Moorthy offer you the art and the science, the taste and aromas. From recipes to remedies, you’ll find spices you probably already know (like basil and ginger) as well as those you’ll want to explore or repurpose (saffron, say). I am especially delighted to see Ashwagandha get its due!”

— Michael Anne Conley, MA, LMFT, Integrative Health Consultant, Director at *Stillpoint Integrative Health Center*

“Incredible health, healing, happiness and harmony emanates from the *Spice for Life*. I am excited to refer friends, family, clients and doctors to this wonderful book. Dr. Bauman mentored myself and countless others to apply holistic nutrition and culinary alchemy in their very own kitchen. YAYA!”

— Cathy Crystal, NC, Nutrition Consultant & Herbalist, Vibrational Sound & Attunement *SoulCollage*® Facilitator

“I had the incredible fortune to be a taste-tester for the recipes in this book. What heaven! I never knew what delights would await me at day’s end. Everything is SO delicious (with the added benefit of being healthy and nutritious). After experiencing explosions of flavors, I would look over the recipe and be amazed that the words could transform into such culinary masterpieces. Please give yourself the gift of trying all these recipes.”

— Ann Dannelly, Iyengar Yoga & Zen Awareness Practitioner

“*Spice for Life* is a delicious dive into the world of spices. This easy-to-understand book shares a well-rounded look at a variety of spices. More than a cookbook, it provides an engaging and comprehensive resource for traditional uses, health benefits, clinical applications, as well as mouthwatering nourishing recipes. *Spice for Life* is a resource that belongs in every kitchen.”

— Mira Dessy, Nutrition Educator, Author of *The Ingredient Guru*

“The one (and perhaps only) good thing we can say about the breakdown of the conventional health-care system is that it’s causing more and more of us to seek out and discover the profound power of healing foods. Ed Bauman has been a true pioneer in bringing this ageless knowledge to contemporary audiences for decades; and I know that *Spice for Life* will be one of those books that will never leave my kitchen counter. The beauty, information, and recipes contained here make it a must-have volume for anyone who truly wants to take their health and gustatory pleasure into their own hands.”

— Marcella Friel, Author of *Tap, Taste, Heal: Use Emotional Freedom Techniques (EFT) to Eat Joyfully and Love Your Body*

“Ed Bauman has been sharing the good word of nutrition long before it became fashionable. This book is yet another example of his ability to weave together the science of whole foods, in this case spices, with delicious recipes that will spice up your life. This book deserves a spot in the kitchen and confirms what the research tells us, and traditional cultures have shared with us, that food is our best medicine.”

— Mary Sheila Gonnella, NC, BCHN, Health and Wellness teacher, speaker, practitioner at *Occidental Nutrition*

“Dr. Ed Bauman and I have been colleagues and friends for many decades. He is an excellent nutrition teacher and great chef with a Masters in Spice. *Spice for Life* is superlative! Any great chef knows that spices are the key to add flavor and health to our diet and to our life.”

— Elson Haas, MD, Family Medicine Practitioner, Author of many books, including *Staying Healthy with Nutrition*

"*Spice for Life: Self-Healing Recipes, Remedies and Research* combines just the right mix of Ed's passion for evidence based nutrition education and years of recipe creation with Shiela's fragrant Indian kitchen and scientific mindset. Their delicious recipes are accessible and beautifully photographed by Christine Bauman."

— Patty James, MS, NC Founder, *Patty James Cooking School and Nutrition Center*,
Author of *More Vegetables, Please!*

"To fully understand *Food as Medicine*, we must open the apothecary's chest, filled with herbs, resins, and spices. The warm smell of clove, allspice, coriander, celery, and black pepper used in corned-beef or chi permeates the air. These powerful anti-viral spices date to the time of the crusades for those of northern European ancestry, far longer for others. The traditional and creative recipes included in *Spice for Life: Self-Healing Recipes, Remedies, and Research* once again awakens our hunger for food as medicine. Spices have been in use as flavorings and medicine from the dawn of time. As a third-generation wild-crafter and lover of herbs and spices, this book will hold a place of honor and use in my kitchen library."

— Tammera J. Karr, Ph.D., BCHN, Food Historian and
Author of *Our Journey with Food Cookery Book*

"In *Spice for Life*, Dr. Ed and Shiela take us on a wonderful adventure through the fascinating world of spices and their life-affirming and healing properties. Their beautifully illustrated book is not only an antidote to processed food and resultant metabolic syndrome disease but a path for those seeking the zest-filled life."

— Todd Knobel, Founder and CEO, *Foogal, Inc.*

"Using food as medicine just got easier! *Spice for Life: Self-Healing Recipes, Remedies and Research* take the reader on a journey that will not only awaken their senses but also their understanding of how to use the healing power of spices in their daily lives. With recipes and detailed descriptions of the flavors, health benefits and research behind a range of herbs and spices, readers will be empowered to get into the kitchen and explore their newfound love for these flavor-bombs!"

— Sally Lamont, Naturopathic Doctor, Acupuncturist,
Cook and Founder of www.drssallyskitchen.com

"If there is a Michael Jordan of nutrition education, it is Dr. Ed Bauman, founder of Bauman College. *Spice for Life* showcases an abundance of vivid illustrations, self-healing recipes, remedies and scientific research that bring life to the world of nature's medicine. This one of a kind manual will empower and provide an understanding of the vast world of spices, and how they can be used in everyday life. I highly recommend this book, a remarkable encyclopedia of wisdom."

— Rob Liakos, NC, *True Earth Farmacy*, Savannah, GA

"I find myself returning to *Spice for Life* regularly for directions on usage, herbal lore, and a variety of delicious recipes. I love these spices! As Ed and Sheila introduce you to memory-enhancing basil, the warmth of ginger, the pungency of peppers, and ashwaganda, an herb that calms and energizes at the same time. These 10 plant personalities will fill your teacup, your garden, your plate and your heart."

— Erin Livers, Nutrition Therapist, *Food As Nourishment Revitalize Digestion*

"I have had the good fortune to know and work with Ed Bauman for more than 20 years. In that time we have collaborated on numerous nutrition and health-related projects that were always inspirational and transformative. Ed and I have also seen a lot of great jazz here in the Bay Area. Already, I digress... Dr. Bauman and his co-author Shiela Moorthy has given us an enormously valuable resource for delving into the world of herbs and spices. *Spice for Life* is truly a "one-stop shopping" work that provides an abundance of information for the clinician, chef or food enthusiast alike. I love the format because you get a balance of history, research, clinical pearls and of course, delicious recipes. This is one of those books you'll wish you had years ago because it is so thorough and has all the excellent, diverse and well laid out content you want at your fingertips. Get this book. Read this book. Read it again... and the next time someone asks you why you think turmeric is "such a big deal," you can say with confidence (and say it with your best Arnold Schwarzenegger impression), "I've read *Spice for Life*."

— Geoffrey Marx, Clinical Nutrition Consultant, Chef,
Marx Culinary

"I couldn't be more impressed with the the *Spice for Life* book written by my mentor, collaborator on all things nutrition and culinary and dear friend, Ed Bauman and his co-author, Shiela Moorthy. I saw the seedling of this creation starting with Ed's spice blend, '*Spice of Life*.' Now that spice blend has been unfolded into an incredible book that is part research manual, part cookbook and part user manual for the gardener, herbalist or healing foods chef. It's not only a treasure tome of well-researched nutritional wisdom, gardening tips and delicious recipes but a heartening travel guide to what is clearly a passion for both authors; the connection between powerful healing spices and a mutual love for cooking and community. As a culinary nutrition instructor, I would strongly recommend this book as a valuable resource and as a chef I would gladly gift this book to anyone interested in deepening their knowledge about herbs and spices."

— Lizette Marx, NC, Chef Instructor, Culinary Nutritionist, Yoga Teacher and Author, *Marx Culinary*

"Wow, *Spice for Life* is a humdinger, a real gem! It is a compendium of everything that's sexy, practical, clinical, and exciting about spices. In my 30 years working in the natural lifestyle industry, *Spice for Life* is the first book on herbs and spices that's hit my hot button when it comes to culinary use. It's the ultimate bedside read."

— James McDonald, BSc Dip ION, *JM Nutrition Services*, Reading, United Kingdom

"*Spice for Life* asks and answers the question of why use herbs and spices in your daily life. It adeptly provides examples of how to use them, when they should be avoided, and how to grow and cook with spices to add flavor and zest. Wonderful information is provided for practitioners wanting a deep-dive into clinical research as well as treasures for self-help nutrition consumers searching for spice nutrition lore. This book belongs on everyone's shelf, or better yet, in their kitchen. I know it will be in mine."

— Barbara Rodgers, NC, BCHN®, Author of *Baby Maker: A complete guide to holistic nutrition for fertility, conception and pregnancy*

"*Spice for Life* is a great title and book by Dr. Bauman. I have had the good fortune of meeting Dr. Bauman and love this great book on spices with recipes. He has been able to intertwine and narrate traditional and scientific knowledge of these herbs with authority. Herbs and spices have been used all over the world for their culinary and healing properties. My grandma used herbs and spices for almost every ailment humans suffer with greater success. I wish Dr. Bauman great success with his book. With best wishes."

— Dr. Virender Sodhi and Rekha Sodhi, *Ayush Herbs, Ayurvedic and Naturopathic Clinic*, Seattle, WA

"In this book, Ed and Shiela have blended a mastery of nutrition with a delicious treasury of spice lore. *Spice for Life* is a great resource on how spices and seasonal herbs enhance the flavor of vegetable, chicken, fish and meat dishes. Spices and herbs have long been revered for their health attributes. This book is a remarkable transformational resource."

— Karen Weaver, MBA, NC, Owner of *Flour Chylde Bakery and Café*

"Food is medicine and medicine is food, especially when we include culinary herbs and spices, of which Ed has so elegantly captured in this treasure of a book *Spice for Life*. The combination of wonderful recipes, with in-depth information on the health benefits, and the beautiful photography, it pulls you in, and soon you will be in the kitchen creating one of these dishes or running to the store to pick up a spice you may not have ever used before."

— Donnie Yance, Clinical Herbalist, Founder and President of *Mederi Centre for Natural Medicine*

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SELF-HEALING RECIPES, REMEDIES AND RESEARCH

Ed Bauman, M.Ed., PhD & Shiela Moorthy, MA, MBA, NC

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Dedications

This book is dedicated to my mother, Pramila Murthy (and all mothers) whose energy sees no bounds. She is forever positive, a born healer. Her tasty home cooking has nourished our families and friends for as long as I can remember. Whether in Bangalore, India caring for her mother, or in the United States visiting her beloved children and grandchildren, Pramila is ever ready to cook, care for others and share her deep faith and love.

— Shiela Moorthy

My wife, Chris and I share this dedication with Shiela to her mom. We had the honor and pleasure to visit her in India recently. Pramila changed our life with her warm and lasting embrace. We had so much fun cooking with her, picking up tips and tricks she intuitively used in preparing the best tasting food we have ever tasted. You are an inspiration to us.

Shiela and I offer the blessing of *Spice for Life* to families everywhere as they renew their relationship with traditional food and healing spices prepared with love. May all of our relations and Mother Earth be cherished and well-nourished. Namaste.

— Ed Bauman

Acknowledgments

I am deeply grateful to every member of the *Spice for Life* team for their tireless effort to create a book that will be read and enjoyed by many across the globe for years to come. Shiela Moorthy, thanks for accepting my challenge to “show me the research” that spices heal and how they do so. Chris Bauman, thanks for the images you styled and shot that adorn our book. Your photos captured the light within and around each special spice and recipe. Linda Ford, thanks for testing recipes with us and adding your love to the project. Francesca Fifis, thank for being our editor, for checking the authenticity of the work, polishing language, and creating a consistent recipe format. And finally, thanks to Phyllis Peterson, book designer and project coordinator. You laid out the brilliant template, and lovingly held us accountable to produce every piece of our spice puzzle, that you then carefully laid into place. Huge high five to Jennifer and Donnie Yance for crafting a great preface to be the perfect hors d’oeuvre for a main course of *Spice for Life*.

I honor my teachers and mentors for the past fifty years, beginning with my mother, Jane Bauman, who taught me to smell the cantaloupes before picking the best one. Shout out to my daughter, Jessica Bauman, who may still be the best chef in our family, though that will always be up for debate. Blessings and love to friends and colleagues who share our love of healing spices, education, and co-creating a world of well-being for all.

— Ed Bauman

I am eternally grateful to Dr. Bauman, for trusting me on this very important journey to document proof and relevance of how spices do more than make food pleasing to our palates. You are a wonderful human being, generous, kind, and always taking care of the community. I am grateful to Phyllis Peterson for a blow out job in designing *Spice for Life*, Francesca Fifis for patiently editing the text, and Chris Bauman for her artistry in photography and placement.

I am very grateful to my grandmother Jaiakka, for her unconditional love and affection, who at 97 years old, is an amazing role model. I am grateful to our neighbor Eileen Winchell for celebrating every milestone we have reached with numerous cups of tea and warm hugs. Thanks to Judy and David Deardorff for your invaluable help with food preparation and recipe testing. Thank you to Dave and Dawn Lindberg, and Kurshid Kazim for taste-testing and providing candid feedback. I am grateful to my husband Girish Moorthy for standing by me as I dedicated so much time and rigor to this epic project. You are a great cook and make the greatest tea. Thanks to Nikhil Moorthy, our son, for your love, affection and humor. Your refined palette affords you a great potential to carry on our family lineage of preparing beautifully spiced homemade meals.

— Shiela Moorthy

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Preface

Donald R. Yance, CN, MH, RH (AHG)

Ed and I have been close colleagues and friends in the field of health for well over two decades. In watching trendy diets come (and often go), we have both stayed true to our whole-food balanced, approach. We believe in the importance of what tradition and culture teaches, as well as what we continue to learn through modern science.

As Hippocrates said: “Let food be thy medicine and medicine be thy food.” This is especially true when we include culinary herbs and spices. In *Spice for Life*, the combination of wonderful recipes, with in-depth information on health benefits, and beautiful photography will entice and draw you in. Soon you will be in the kitchen cooking up one of these dishes or running to the store to pick up a spice you never knew or used before.

Besides being an herbalist, nutritionist and jazz musician, I am a chef as well. I have an intense passion for food preparation and cooking. It is no different than mixing synergistic herbs for medicine or composing music. Studying the medicinal value of common spices is like studying theology to me. There isn't a finite end. The deeper we go in uncovering their endless health benefits, the closer we get to see the face of the Master at work, in a most humble way.

One of the reasons spices such as turmeric and cumin were added to dishes was to reduce rancidity and oxidation, thus extending their shelf life, often without refrigeration. When we consume these same herbs, they preserve our cellular health, protecting us from damage, and even aging. They are not anti-aging; for they aren't against aging, but rather they enable us to age gracefully.

Recently I have been fascinated by a human-to-plant concept called “xenohormesis.” The notion that plants make substances of benefit to human health has been known for millennia. Did you ever think that all those wonderful aromas (I love the smell of fresh basil and rosemary) that add the taste we love from the herbs and spices are nature's healing pharmacy (farm-acy)?

Many of the known active compounds in spices are referred to as secondary compounds. They evolve within the plant, through the plants life-force intelligence for stress protection. Their synthesis coincides with environmental stresses — UV light, lack of nutrients, disease, and predation. An example of members of one broad chemical class in plants that confer human health benefits are the phenols. Curcumin is a phenolic compound in the well-known curry spice turmeric. The content of phenols provides a chemical signature within the plant that adapts to the state of the environment. Stress-induced plant compounds tend to upregulate pathways that provide stress resistance. People who consume non-pampered plants develop mechanisms to become attuned to chemical cues and respond like a cellular Tai Chi master, or when seriously provoked, like a kick boxer.

The health benefits from phytochemical compounds in spices are not simply from responses to mild cellular damage or from their antioxidant properties, but rather from the evolutionarily adaptive modulation of the enzymes and receptors of the stress-response. You see what I am talking about when I say theological, and let's add profoundly beautiful!

The science of epigenetics is turning what we've long held true about biological destiny upside down. Although it remains true that our DNA — our genetic code — provides the blueprint for our physiological makeup, researchers have discovered that there's something extra controlling our genes — and culinary herbs, spices and food may in fact be the most important factors in our genetic well-being.

A Look Forward

As several metabolic diseases and age-related degenerative disorders are closely associated with oxidative and inflammatory processes in the body, the use of culinary herbs and spices offer a sensible, easy and tasty way to combat disease. *Spice for Life* is the bible to help guide you in your daily quest to become a co-creator with nature to live long and well. I will be recommending *Spice for Life* to all of my patients and students.

Donald R. Yance is a Certified Nutritionist and Master Herbalist. He is the President and Founder of *Mederi Center and Natura Health Products* in Ashland, Oregon.

Introduction

Herbs and spices are a key component of healing foods, imparting taste, texture, aroma and nutrition. These plants, originally found in the wilds, and now cultivated for worldwide consumption, contain the most concentrated amounts of vitamins, minerals, protective and restorative phyto (plant) nutrient compounds of all the foods known to man. Yes, spices are more nutrient dense per ounce than meats, dairy, grains, legumes, nuts, seeds, vegetables or fruits! Spices enable us to optimally digest and assimilate our daily foods, which is especially important to an aging or ailing population.

For those who did not grow up in a household with traditional homemade food, spices may appear to be exotic, and taste rather strong, even off putting. Pungent spices are often savory, bitter and astringent. These tastes are not common in standard bland, *one taste fits all*, commercial cuisine that is familiar to an unseasoned palate. Herbs and spices, when properly used by a skillful chef, give simple food a remarkable aroma, taste and “wow” factor. Spices provide the eater with a synergistic effect of hundreds and in some cases thousands of phytonutrients, that gives the plants and the dishes and beverages that contain them, their bright color, complex flavor, and powerful medicinal effect.

Ethnic cooking from every part of the globe features locally grown herbs and spices to give foods their distinctive aroma and flavor profile. Sadly, modern American cuisine is one of the least spice-centric of all world cuisines. Burgers and fries, meat and potatoes, cereal, cookies and milk, ice cream, diet soda and energy drinks, typically lack aromatic herbs and savory spices. Salt, pepper, fat and sugar predominate in conventional restaurant or processed, prepared foods, rather than green tea, ginger, garlic, chili, saffron, cumin, oregano, and thyme that liven up Asian, Mid-Eastern and Latin American dishes.

Renowned ethnobotanist James Duke examined 4,500 recipes from 100 cookbooks. They found that 93% contained at least one spice, with the average amount of spices per dish to be four. That average is

a minimum in the healing cuisines of India, Thailand, China, European and Mediterranean countries. It is the combination of fresh, whole foods plus distinctive local herbs and spices that define the elegance and signature of these beloved international cuisines. (*CRC Handbook of Medicinal Spices*, 2002)

Why Use Herbs and Spices?

- Give food a mouthwatering aroma that stimulates the appetite
- Blend in new taste sensations
- Impart layers of flavor, such as sweet, salty, savory, sour, hot
- Serve as natural tenderizer for meats and gluten-free grains
- Add body and texture to dishes, acting as thickeners and binders for sauces
- Color a dish, making it a feast for the eyes
- Promote a robust digestive process
- Improve liver detoxification, immune function and tissue healing

A Life and Health Changing Book

Spice for Life is a handbook to educate people who never received vital nutrition, culinary, botanical or self-care information to wake up and smell the garlic, taste the spicy chai, and savor the pesto. Our experience has been that when people eating regular, somewhat healthy foods, elevate their eating experience as they learn to prepare and enjoy what we call S.O.U.L. (seasonal, organic, unprocessed, local) food, with herbs and spices, they awaken an innate food intelligence that has been muted by a lifetime of poor eating habits and choices. Herbs and spices are nature’s way of reminding us that it’s thyme to wake up and *Eat for Health™*.

Spice for Life will provide the reader with a blend of reliable, non-commercial information, not found in any one book, journal, or online website. This includes information on herbs and spices, history and use, constituents, health benefits, medicinal use

and synergies, supplement use and dosage range, culinary blends and sauces, easy to make gourmet recipes, self-care remedies, home cultivation, and online ordering resources.

Health Benefit of Herbs and Spices

When herbs and spices are added to fresh, whole foods, they impart a salutary benefit that contributes to strengthening of all body systems, cooling inflammation, balancing sensitive neurometabolic, hormonal signals and building cellular resilience. Eating this way can slow the onset of premature aging and illness and complement modern medicine to manage and in some cases reverse disease. This is the most exciting research we are witnessing today in the field of nutrition and integrative medicine. As our grandparents were taught by their parents and grandparents, learning how to cook is crucial to holding a family together and building their health. Knowing how and when to use flavorful herbs and spices not only protected our forebears, but warded off infection and illness that could have wiped them out.

Now, as in times gone by, the cure can be in the kitchen, if the kitchen, garden and pantry are properly stocked. Fortunately, dried herbs and spices have the same, and often more potency than their fresh counterparts, so one can stock up, once it is known what to have on hand.

Diet-Disease Connection

Many Americans and people around the world eating modern convenience foods, have lost interest in cooking and rely on takeout or pre-packaged foods with numerous additives and preservatives, high in calories and low in nutrients and flavor. Eating this way is unsatisfying and unhealthy. Lifelong poor eating habits and choices can be directly correlated with premature chronic illness as evidenced by the precipitous rise in food and chemical sensitivities, obesity, allergies, blood sugar and hormonal imbalances, depression, anxiety and insomnia. These conditions can often be resolved with a change in diet, lifestyle and attitude, greatly enhanced by the addition of herbs and spices enjoyed at each meal as part of well prepared, nutritionally concentrated foods.

When the health syndromes and conditions mentioned above are not addressed properly and in a timely fashion, more serious disease progression tends to follow. This is evidenced by the alarming rise of diabetes, cardiovascular disease, autoimmune disease, such as Hashimoto's thyroiditis, multiple sclerosis, lupus, rheumatoid arthritis, neurodegenerative conditions such as Parkinson's, Alzheimer's and dementia, as well as the most challenging illness of all, cancer, that can affect any system of the body. While modern medicine has an impressive array of diagnostic techniques, pharmaceutical and surgical options to manage disease and expand the lifespan, the quality of one's life can be compromised due to treatment complications and side effects.

Statistics for 2014 indicate that heart disease causes almost one third of all U.S. deaths. More than 68% of American adults over the age of 20 are overweight or obese; 8.3% of our adult population have been diagnosed with type-2 diabetes, while about half that many are thought to be afflicted with it but undiagnosed; and another 38.2% of adults have pre-diabetes (1), an almost equally dangerous condition of high blood sugar. (Go, et al., 2014)

Herbs and spices, with their high density of protective phytonutrients and antioxidants, when consumed daily as part of one's diet, or as a therapeutic supplement at an appropriate dose, are powerful and reliable ways to cool inflammation and detox from environmental chemicals.

How Taste Influences Metabolism

According to traditional Ayurvedic, Chinese and Naturopathic medicine, the flavor of a food or spice has a profound influence on the physiology, endocrinology and neurochemistry of the body. Strong, clear tastes set our digestion in motion, and at some point, send signals to the brain that we have eaten enough. The most predominant flavor of many plant medicines, is bitter, one the average person only experiences when eating dark chocolate, black coffee or perhaps bitter greens, such as arugula. In truly excellent cooking all six tastes are present, in balanced amounts, giving food a bright flavor, and dynamic healing effect.

Widening one's flavor palate is key to enjoying more tastes that spices can bring to a dish.

Bitter — Detoxifies the body, cleanses the liver, controls skin ailments, aids lymph flow and protein digestion

Astringent — Causes constriction of blood vessels, reduces secretions such as sweating and bleeding

Pungent — Stimulates appetite, maintains metabolism, improves blood circulation

Salty — Cleanses tissues, makes the system limber, activates digestion, supports adrenal glands and kidneys

Sour — Aids in digestion and elimination of waste from the body, assists in liver detox and fat metabolism

Sweet — Promotes tissue growth, comforts the body, relieves hunger

Spices in Action

- **Turmeric** adds a bitter flavor, brilliant orange color, promotes digestion, healing of inflamed tissues and improved liver and immune functions.
- **Coriander**, the seed of the cilantro plant, can be used as a sweet spice with cereal, yogurt and fruit, as well as a thickener, imparting a nutty, aromatic flavor. It can be chewed as a breath freshener.
- The chlorophyll-rich **cilantro** leaf, combined in formulas with chlorella, marine algae, has been used to safely detoxify mercury from body and nerve tissues.
- **Ginger** root makes a delicious tea, spice for stir-fry dishes, flavor for cookies, tonic for sluggish digestion and to alleviate nausea

Specific Examples of Healing Herbs and Spices

Herbs and spices play a significant role in the prevention and management of heart disease, cancer, diabetes, allergies, asthma, obesity, depression and cognitive decline. International research is released on a regular basis confirming the health benefits of a plant

based diet, supplemented with an array of herbs and spices. Little of this comes from the U.S., where pharmacology is the dominant paradigm. For example:

- Herbs, such as **rosemary**, **sage**, **oregano**, **thyme**, **cilantro** and **parsley** have significant amounts of flavonoids which can act as antioxidants to protect LDL cholesterol from being oxidized. They can inhibit the formation of blood clots providing anti-inflammatory and anti-tumor benefits. A study published in 2002 in the *American Journal of Clinical Nutrition* (Knekt, et al.) showed that consuming more plant bioflavonoids is linked to lower incidence of heart disease and stroke, and is more protective than statin drugs.
- **Lemongrass** and **mint** help block the production of cholesterol. **Fenugreek** is high in saponins and soluble fiber which helps decrease the absorption of cholesterol from food and can help lower blood glucose levels in people with diabetes (Kumar, et al., 2011).
- **Ginger** contains several natural terpenoid and phenolic phytochemicals that inhibit the formation of blood clots. Ginger has been used in medicine to assist pregnant women with managing morning sickness. Ginger combined with turmeric, which contains curcuminoids, have been reported to prevent cancer development.
- **Cinnamon**: A study published in *Diabetes Care* in 2003 has shown that small amounts of cinnamon in humans can lower blood glucose, cholesterol and triglycerides. Sixty Pakistani men and women were divided into 6 groups and given 1, 3 or 6 grams of cinnamon or similar amounts of placebo for 40 days. Blood glucose and lipids dropped on average by 20% and remained low for 20 days after intake was stopped. The impact on blood levels was the same at all doses i.e. there was no dose response — so 1g was as effective as 6g. Cinnamon has also been found to enhance insulin activity (Sahib, 2016).

Cooking with Herbs and Spices

In India and Indonesia, spices such as garlic, ginger, turmeric and chili added to hot oil at the beginning of a recipe infuse meats and vegetables sautéed in them with a savory flavor. Then, later in the cooking process, the more delicate flavors from herbs such as basil, cilantro and dill are added to finish the dish, or as a garnish to balance and cool the hot spices used earlier in the preparation. The contrast and blending of flavors is what creates a rich and enjoyable experience for the eater and his or her metabolism, which responds to the symphony of taste, texture and nutrition of the culinary composition.

How to Spice Up Your Life

Culinary herbs and spices can be used in a variety of creative ways. You can add them to any recipe including soups, stews, breads, mustards, marinades, butters, sauces, salad dressings, stocks, vinegars, desserts and beverages. To be an excellent home chef, it is important to maintain dry good products that are fresh and not rancid. Flours, grains, seeds, nuts, herbs and spices oxidize and become rancid when exposed to heat and light. A kitchen makeover is the first step in wanting and being able to prepare exciting, healing foods at home. Here are some suggestions on getting stocked up:

- Utensils for preparing fresh herbs include scissors, a sharp knife and a cutting board.
- Utensils for preparing dried herbs include a grinding mill, or a mortar and pestle.
- Use wooden utensils when mixing prepared herbs.
- Dried herbs are more concentrated than fresh. One teaspoon dried herb equals three teaspoons of fresh.
- If you regularly use herbs in your cooking, it may save you time to prepare your own “*bouquet garni*” stash. Parcel your chopped and mixed herbs in little muslin bags. Add a bouquet garni during the last stages of cooking.
- Unlike other herbs, parsley retains its flavor during the cooking process and can be added at the start.

- Fresh herbs can have a more pungent flavor due to the higher content of fragrant essential oils and antioxidants. During the herb drying process there is a loss of oils and nutrients.
- The flavor of herbs diminishes with time; discard if they become rancid.
- Dried whole herbs i.e. where the leaves are still attached to their stalk tend to be “fresher” and have a stronger flavor than loose leaves sold in packets/bottles. Dried whole herbs such as oregano and sage can be purchased from shops specializing in Mediterranean or Middle Eastern products.

Wonderful Herb and Food Combinations

Try combining herbs as follows to enliven the flavor, and boost the nutritional value of the foods you enjoy. Something as simple as popcorn can be quite tasty, and much more nourishing when adding any of your favorite herbs and spices mentioned below:

Basil — pesto, tomato sauce, tomato soup, tomato juice, potato dishes, prawns, meat, chicken and poultry, pasta, rice, egg dishes

Bay leaf — soups, stews, casseroles, meat and poultry marinades, stocks

Chili — meat, chicken and poultry, prawns, shellfish, tomato dishes, curries

Chives — salads, chicken, soups, cheese dishes, egg dishes, mayonnaise, vinaigrettes

Coriander — Asian dishes, stir-fries, curries, soups, salads, seafood

Dill — salads, sauces, fish, salad, sour cream, cheese and potato dishes

Fennel — stuffing, sauces, seafood, mouth freshener

Garlic — soups, sauces, pasta, meat, chicken, shellfish, pesto, salad dressings, bread

Ginger — cakes, biscuits, tea, Asian dishes

Lemongrass — Asian dishes, stir-fries, curries, seafood, soups, tea

Marjoram — meat, fish, egg dishes, cheese dishes, pizza

Mint — drinks, confectionary, meat, chicken, yogurt, desserts, sauces, vegetable dishes

Oregano — cheese dishes, egg dishes, tomato sauce, pizza, meat, stuffing, bread, pasta

Parsley — pesto, egg dishes, pasta, rice dishes, salads, butter, sauces, seafood, vegetable dishes

Rosemary — fish, poultry, meat, bread, sauces, soups

Sage — stuffing, tomato dishes, cheese dishes

Tarragon — salad dressing, egg dishes

Thyme — chowders, bread, poultry, soups, stock, stews, stuffing, butter, cheese, mustard, vinegar

Turmeric — stir-frys, soups, stews, smoothies, marinades, Asian dishes

Herbs and spices are rarely used alone. When mixed together, the effect is synergistic, symphonic, magnificent, delightful, and even transformational. When incorporating high quality herbs and spices with fresh whole foods, an ordinary meal can become memorable. A good chef will follow a good recipe and make a beautiful meal. A spice-savvy chef, will take a good recipe and modify it to make it even better by tasting his or her product as he or she prepares it and adding ingredients and flavors to take the dish to another level. Recipes provided in this book are starting points for a home cook to work with. Below is a basic list of suggested herb and spice combinations, that are presented to the home chef to experiment with in the kitchen, to adjust to his/her taste and tolerance level:

Basil — goes with chives, chili, garlic, oregano

Bay leaf — goes with parsley, thyme, garlic, oregano, marjoram, turmeric

Chili — goes with coriander, garlic, ginger, lemongrass, mint, oregano, turmeric

Chives — go with basil, garlic, tarragon

Dill — goes with chives, garlic, parsley, tarragon

Garlic — goes with basil, rosemary, sage, fennel, chili, coriander, turmeric

Sage — goes with rosemary, garlic, marjoram

Thyme — goes with bay, parsley, garlic, rosemary

Oregano — goes with basil, parsley, chives, thyme, bay, chili

Herbs and Spices Differentiated

Culinary herbs are *herbaceous* (leafy) plants that add flavor and color to all types of meals. They have been used for centuries to preserve food due to the presence of antioxidant phytochemicals. The flavors are provided by the essential oils and *oleoresins* (natural plant substances) and the pungency or strength of the flavors is due to the *alkaloid* (organic compound) content. The antioxidant content of the herb can vary from plant to plant based upon where the herb was grown, the maturity of the plant when harvested, the plant variety and the part of the herb used. Herbs grown using natural agriculture mature slowly and as such have a superior taste, nutrient composition and influence on one's metabolism. Home grown herbs and spices are not irradiated, which is required of all commercially grown and distributed herbal products.

The parts of the plants used include the seeds, flowers, leaves and roots. In this book, herbs are most often the name we will use for the leaves of an aromatic plant. The roots, seeds and stems are what we will call spices. For example, cilantro is an herb, and coriander, the seed of the cilantro plant, is a spice. If you find that low-fat or low-salt foods taste bland, you can use herbs to enhance the flavor of virtually any dish, including desserts. Generally, herbs are delicately flavored, so add them to your cooking in the last few minutes. It helps to taste test. Too few herbs will contribute nothing to your dish, while too many will overpower the other subtle tastes.

Herbal Cultivation

Originally, herbs grew wild in the woods, by streams and paths, and were sought out by animals for food and healing. Today, most herbs are not wild-crafted, but rather are grown commercially and sold fresh at farmers' or roadside markets. Dried culinary and medicinal herbs fetch a good price at natural health food stores or herbal apothecaries. Herbs do not require rich soil, abundant water or sunlight. The culinary herbs we will be featuring grow beautifully with the natural landscapes, where annuals and perennial plants can grow at their own pace without fertilizer or additional soil amendments.

Using herbs and spices at every meal as teas and seasonings provide wonderful booster foods to turn ordinary dishes into S.O.U.L. (seasonal, organic, unprocessed and local) satisfying meals that send a positive message to our genes and cells to *celebrate life* and perform optimally and efficiently.

How to Use This Book

We invite you to first browse *Spice for Life* to get a sense of the breadth and depth of this transformative resource. Take note of the parts that are most interesting to you, the plant uses, health benefits, medical uses, recipes, remedies or cultivation techniques. Consider if you are most in need of finding some new recipes to feed your family, or remedies that will help you or your loved ones recover from ailments, injuries, nagging conditions, and even life-threatening diseases. Then, pick the plants you want to get acquainted with. See if you can grow them on your porch or in your backyard. Purchase the fresh form when possible, or the dried form, when fresh is not an option. Get to know the flavor of the herb or spice. In most cases, there are layers of flavor.

The first taste may be bitter, sour, savory, mildly sweet, salty or astringent (somewhat metallic). The flavor of the plant will enable you to appreciate its potency and compatibility with other foods, herbs and spices. If you have the inclination, you can make your own fresh tincture, by putting the herb or spice into apple cider vinegar, red wine, or into brandy, and let it soak for two weeks and then strain and use. Directions will be provided in each chapter.

Notice how and where the plant affects you. Is it calming or stimulating? Is it heating or cooling? Does it make you hungry, or is it satiating? Does it cool your inflammation or ease your pain? If so, how long does the effect last? What do you like or not like about adding a new spice to your life? Can you sense how much to use?

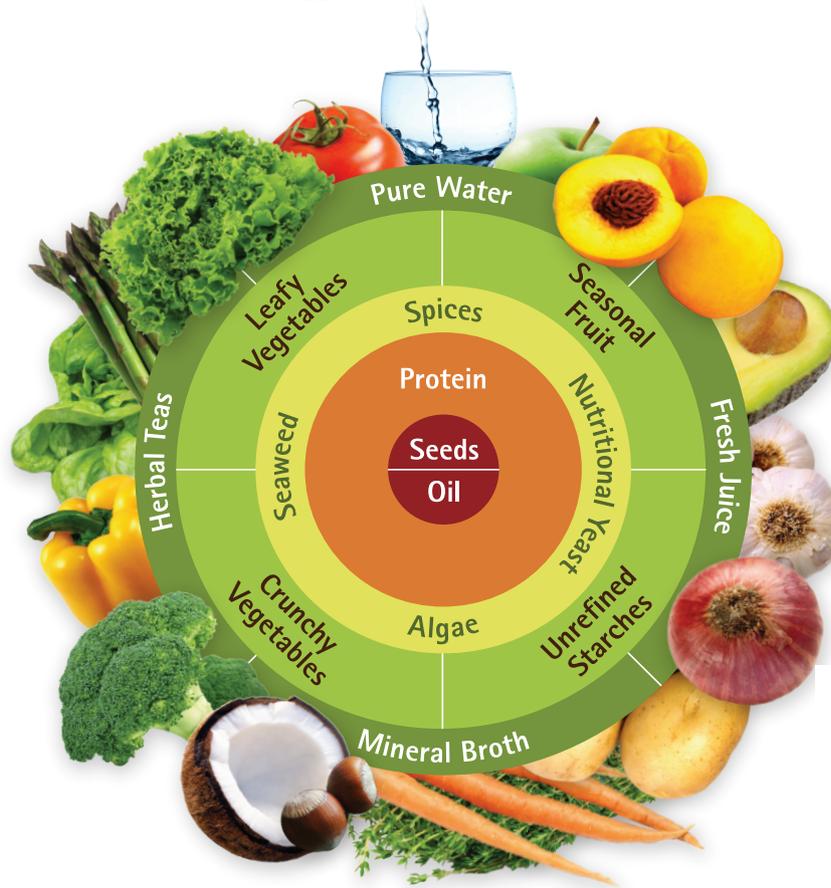
Our purpose is to reconnect you with the forces of nature that cannot be manufactured in a lab, or be provided in isolation. Herbs and spices are not drugs. You can't take two and call your doctor in the morning if your symptoms persist.

We encourage you to find ways to add herbs and spices to as many beverages and foods as you can, even those that are pre-packaged, as few of us will make all our food from scratch. Learning how to make a spice blend, salad dressing, sauce, or tonic beverage will not only empower you, but also be a source of curious conversation and benefit to your friends, family and associates. Even the most cynical skeptics will notice that you are looking and feeling better when you add healing herbs and spices to your food. They will at some point, ask what are you doing, how did you make that delicious soup, stew or chopped herbal salad? As time goes on, with daily use of quality herbs and spices, your desire to satisfy your cravings, or manage your stress with sugar, caffeine, alcohol or recreational drugs and negative behaviors will likely recede as you become less reactive and more resourceful.

A cup of tea is always a great remedy, when you need time to reflect, reset and chill out. Prepare a cup of herbal or green tea from one of the recipes in this book, as you set out to dig into the ancient wisdom and modern research found in *Spice for Life*. Enjoy the nutrition and culinary arts education found in the chapters to come. Allow yourself to progress at your own rate.

May the practical information and love of life and health found in *Spice for Life* guide your way forward to live longer, and better, with more joy, happiness and ability to serve others and the greater good as you pass on what you learn from experience to others just getting on the spice road to well-being.

Eating for Health



Eating for Health Serving Chart

Food Group	Seeds/Oils	Protein	Leafy Vegetables	Crunchy Vegetables	Unrefined Starches	Seasonal Fruit	Booster Foods
Daily Servings	2-3	2-4	2-3	2-3	2-4	2-4	2-4
Serving Size	1 Tbs oil 2 Tbs seeds	3 oz animal 6 oz vegetable	1 cup	1/2 cup	1/2 cup whole grain, 1 medium root vegetable	1/2 cup or 1 medium piece	1 tsp to 1 Tbs
Examples	flax, sunflower, sesame, almonds	poultry, fish, eggs, milk, beans	salad mix, spinach, kale	broccoli, string beans, onions, celery	grains, bread, yams, winter squash, corn, millet, rice	berries, apple, grape, citrus	nutritional yeast, algae, spices, seaweed



Reader's Offer

CHAPTER ONE

Turmeric

(*Curcuma longa*)

Turmeric with its most active constituent, *curcumin*, has been the top selling natural health product for the past three years. Our aim is to awaken the modern world to the benefit of using turmeric root and powder as an everyday spice. Asian populations who eat turmeric alone or in a blended *masala* or what we call curry, on a frequent basis, live long and well, free of cancer, heart disease and arthritis. All parts of the turmeric plant have healing properties, not only curcumin. Its taste is bitter and astringent (pungent), so it is a new flavor for a first world palate. This unique taste and effect from its array of carotenoids and bioflavonoids, is what makes turmeric potent. It is better absorbed when mixed with black pepper and consumed with a quality fat such as coconut or whole milk.

Turmeric has been a staple in the traditional cuisine and medicine of Ayurveda, Chinese Medicine and in Perso-Arabic systems, to alleviate inflammation, protect the liver, and help the body prevent and slow disease progression in cancer and nearly every illness. Recipes and remedies are provided to guide you to use turmeric often and safely for food and self-healing.

While traveling in India recently, my wife injured her toe (diagnosed colloquially as *shoe bite*) which became infected. It was a frightening situation which was not ameliorated quickly with antibiotics and topical cortisone cream. I suggested, and our Indian "Auntie" Pramila mixed up a poultice of turmeric powder and mustard seeds for topical application. With this breasting like plaster, Chris' toe looked like a piece of fried chicken. By the next day the pain and swelling were down. Within three days, voila, the problem was resolved. Reach for turmeric root and powder as a number one booster food spice and for first aid remedy.



Harvested turmeric at the market in India.



Auntie Pramila Murthy and her masala dabba dish.



Fresh turmeric root and powder

Background and Uses

Turmeric (*Curcuma longa*), is a spice native to South Asia. It migrated to the Far East, the Mideast and the West via the silk route when the spice trade thrived nearly 5,000 years ago. Turmeric is a pungent spice that forms the basis for many curry powders. It is also used as a natural food colorant. Traditionally, turmeric has been used to heal bruises, sprains, leech bites, inflamed joints, severe chest congestion and common colds. While growing up in India, I (SM) would often drink “Milagu paal” (literally pepper milk in Tamil, a Southern Indian language), that my grandmother would serve as a palliative for a sore throat or chest congestion, and with a dash of her love that would ensure a good night’s rest. I have seen my mother liberally use “haldi” (the term in Hindi or “manjal” in Tamil), in all types of curries, in her beauty regimen, for medicinal purposes and in religious ceremonies as well. Turmeric is abundantly available in India at turmeric plantations, herbal medicine preparations and in the spice bazaars.

Turmeric is a key ingredient in any “masala dabba,” a round stainless steel container with inserts that contains key spices tailored to the needs of an Indian kitchen (See page 9 and 19). I (SM) have been indelibly influenced by the spices of both Northern and Southern India that flavored the food I ate growing up and my mother always used a “masala dabba.” (See page 9.) My current “dabba” has turmeric at the center, surrounded by red chili, ginger, salt, coriander, cumin, mustard seeds, plus a channa dal seasoning blend.

Plant Specifics

Turmeric is an herbaceous perennial plant belonging to the ginger family. It is different from most herbs in that you are not going to be harvesting the leaves, but the roots instead. The plant grows as an underground tuber or rhizome, much like ginger does. It can take 8-10 months for a new crop of roots to develop, and it’s not a plant that you can harvest in small pieces throughout the season.

As many as 133 species of *Curcuma l.* have been identified worldwide. Most of them have common local names and are used for various medicinal formulations. The turmeric plant grows in temperatures ranging between 68-86°F (20-30°C) and requires a considerable amount of annual rainfall to thrive. Individual plants grow to a height of 1m (3 feet), and have long, oblong leaves. Plants are gathered annually for their rhizomes, and are reseeded from some of those rhizomes in the following season. The rhizome, from which the turmeric is derived, is tuberous with a rough and segmented skin. The rhizomes mature beneath the foliage in the ground. They are yellowish brown with a deep orange interior. The main rhizome is pointed or tapered at the distal end and measures 1-3 inches (2.5-7 cm) in length and 1 inch (2.5 cm) in diameter, with smaller tubers branching off. When the turmeric rhizome is dried, it can be ground to a yellow powder with a bitter, slightly acrid, yet sweet taste.

Active Constituents

The rhizome or the root part of turmeric is the part used medicinally. More than 100 components have been isolated from turmeric. The main component of the root is a volatile oil, containing *turmerone*, and there are other coloring agents called *curcuminoids* in turmeric. Curcuminoids consist of curcumin demethoxycurcumin, 5'-methoxycurcumin, and dihydrocurcumin, which are found to be natural antioxidants (Ruby, et al., 1995; Selvam, et al., 1995). The yellow-pigmented curcuminoids represent 2%-5% of the root, typically 85% as curcumin, 10% as demethoxycurcumin and 5% as disdemethoxycurcumin. Curcumin is the most studied component.

Traditional Medicine

In Ayurvedic medicine, turmeric is thought to have many medicinal properties including strengthening the overall energy of the body, relieving gas, dispelling worms, improving digestion, regulating menstruation, dissolving gallstones, and relieving arthritis. Many South Asian countries use it as an antiseptic for cuts, burns, and bruises, and as an anti-bacterial agent,

for respiratory conditions (e.g., asthma, bronchial hyper-activity, and allergies), as well as for liver disorders, anorexia, rheumatism, diabetic wounds, runny nose, cough, and sinusitis (Araujo, 2001). In traditional Chinese medicine, it is used to treat diseases associated with abdominal pain (Aggarwal, et al., 2004).

From ancient times, as prescribed by Ayurveda, turmeric has been used to treat sprains and swelling (Araujo, 2001). In both Ayurvedic and traditional Chinese medicine, turmeric is considered a bitter digestive and a carminative. *Unani* (is the term for Perso-Arabic traditional medicine as practiced in Mughal India and in Muslim culture in South Asia and modern day Central Asia) practitioners also use turmeric to expel phlegm or kapha, as well as to open blood vessels in order to improve blood circulation. It can be incorporated into foods, including rice and bean dishes, to improve digestion and reduce gas and bloating. It is a *cholagogue*, stimulating bile production in the liver and encouraging excretion of bile via the gallbladder, which improves the body's ability to digest fats. Sometimes, turmeric mixed with milk or water is taken to treat intestinal disorders as well as colds and sore throats.

Uses in Modern Medicine

Scientific research over the past fifty years, has demonstrated that a key ingredient in turmeric, *curcumin* (diferuloylmethane), can modulate cell signaling pathways. Extensive clinical trials have been conducted addressing pharmacokinetics, safety and efficacy against several diseases in humans. Certain promising effects have been observed in patients with various pro-inflammatory diseases such as: arthritis, cancer (brain, breast, colon, prostate, colorectal, pancreatic, melanoma) cardiovascular disease, diabetes, Crohn's disease, ulcerative colitis, irritable bowel syndrome, peptic ulcer, gastric ulcer, gastric inflammation, psoriasis, acute coronary syndrome, atherosclerosis, lupus, nephritis, renal conditions, vitiligo, AIDs, chronic arsenic exposure, alcohol intoxication and hepatic conditions (Gupta, et al., 2013).

In dose escalating studies, turmeric has been shown to be safe at levels as high as 12 grams a day for over

3 months. Various formulations have been studied including nanoparticles, liposomal encapsulation, emulsions, capsules, tablets and powder. Some of these delivery mechanisms have managed to improve its bioavailability, metabolism and pharmacokinetics (Gupta, et al., 2013).

Although curcumin has shown efficacy against numerous human ailments, poor bioavailability due to poor absorption, rapid metabolism, and rapid systemic elimination have been shown to limit its therapeutic efficacy (Anand, et al., 2007). As a result, numerous efforts have been made to improve curcumin's bioavailability by altering these features. The use of adjuvants that can block the metabolic pathway of curcumin is the most common strategy for increasing the bioavailability of curcumin. The effect of combining *piperine* (black pepper), a known inhibitor of hepatic and intestinal glucuronidation, was evaluated on the bioavailability of curcumin in healthy human volunteers (Shoba, et al., 2006). In humans receiving a dose of 2g of curcumin alone, serum levels of curcumin were either undetectable or very low. Concomitant administration of 20 mg of piperine with curcumin, however, produced much higher concentrations within 30 minutes to 1 hour after drug treatment; piperine increased the bioavailability of curcumin by 2,000%. The results imply that by adding just 1% of piperine to turmeric could enable better absorption and metabolism.

Most of curcumin's clinical studies have been focused mainly on people with health problems. A recent study, however, evaluated the health-promoting efficacy of lipidated curcumin in healthy middle-aged participants (40-60 years old). In this study, the participants were given either lipidated curcumin (80 mg/day) or placebo for 4 weeks. Curcumin, but not placebo, decreased in plasma levels of triglycerides and *beta amyloid* (plaque). Further, curcumin administration in these participants increased free radical scavenging capabilities. These results demonstrated the health-promoting effects of lipidated curcumin in healthy middle-aged people (Disilvestro, et al., 2012). Adding ghee or extra-virgin coconut oil to turmeric can better its absorption.

Health Benefits of Turmeric

- Potential benefits from regular use are numerous. They include improved circulation, the prevention of blood clots, and alleviation of menstrual and menopausal complaints (Marcus, et al., 2000).
- It can stimulate the flow of bile, promoting the digestion of fats, and expedite the liver's ability to detoxify fat soluble metabolic and environmental toxins, such as pesticides, herbicides, medications, and synthetic hormones given to commercial animals to increase their size and yield of milk and meat.
- Turmeric has hepato-protective activity and can help prevent viral- or chemical-induced liver damage, as well as enhancing hepatic glutathione, a powerful cell protector and phase 2 liver detoxification enzyme precursor.
- Turmeric is a powerful anti-inflammatory, immune-regulator and mild analgesic used in the amelioration of osteoarthritis, rheumatoid arthritis, and bursitis. It is also effective in healing inflammatory conditions of the gastrointestinal tract such as ulcerative colitis, Crohn's disease, celiac disease, gastritis and gastric ulcers.
- Turmeric gradually lowers blood pressure, reduces LDL cholesterol levels and oxidative damage to the liver, blood vessels (atherosclerosis) and eyes.
- Curcumin is used in the treatment of viral infections such as HIV, Zika and Epstein Barr (Bernhardt, 2016).
- Since the discovery of turmeric's antioxidant phenolic compounds, and the protection these compounds provide against free radicals, this spice is now viewed as much more than just an ingredient in curry or a yellow dye. Turmeric's potential use in cancer prevention and recovery is now the subject of intense laboratory and clinical research. Curcumin extracted from turmeric has been found to down-regulate over 70 cell signaling pathways and oncogenes that promote cancer growth.

Cancer: Select Clinical Data

Below is a selection of trials demonstrating the power of curcumin to slow cancer progression.

DISEASE	DURATION	BENEFIT	DOSAGE
Breast Cancer	20 clinical trials	<ul style="list-style-type: none"> Data suggest significant chemopreventive and anticancer potential for curcumin (Alshuler, 2017). 	<ul style="list-style-type: none"> 500-8,000 mg of curcumin per day. Standardized extracts in lower amounts between 250-2,000 mg.
	6 days	<ul style="list-style-type: none"> This study demonstrated that 20-80 μM CUR significantly down-regulates both p53 and ERα protein levels with a concomitant decrease in T-47D cell viability. CUR alone caused a 10-fold decrease compared with the treatment with estrogen, which suggests its antiproliferative effects et al., 2017). 	<ul style="list-style-type: none"> T-47D cells were treated with 5-80 μM CUR for a duration of 24 hours. and control group
		<ul style="list-style-type: none"> Curcumin killed breast cancer cells by arresting their development in various phases of cell cycle and growth and inducing cell death (Ali, et al., 2017). 	<ul style="list-style-type: none"> DK1 a curcumin derivatives cytotoxicity was tested on breast cancer cell MCF-7 and normal cell MCF-10A.
		<ul style="list-style-type: none"> Curcumin nanoparticles were found to be more effective than curcumin in exerting anti-proliferative effect against breast cancer cells. It also prevented metastasis of breast cancer cells (Khosropanah, et al., 2016). 	<ul style="list-style-type: none"> To examine the in vitro cytotoxic activity of cell death of curcumin and nanocurcumin on human breast adenocarcinoma cell line (MDA-MB231). Cytotoxicity and viability of curcumin and nanocurcumin were assessed by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and dye exclusion assay.
		<ul style="list-style-type: none"> Research by Saab et.al highlights that curcumin may be beneficial for treating non-malignant or benign breast tumors as well. A study published in Anticancer Research 2005, demonstrates that curcumin regulates as many as 30 genes and acts on multiple biochemical pathways in order to destroy breast cancer cells (Saab, et al., 2011). 	<ul style="list-style-type: none"> In mammalian, nonmalignant HMEC 184A1 and cancerous MCF-7 cells during curcumin treatment was studied using multiphoton, fluorescence, and <i>atomic force</i> (AFM) microscopies.
Breast Cancer	3 weeks	<ul style="list-style-type: none"> Researchers have identified dosing for advanced metastatic breast cancer at 6000 mg and concomitant use with chemotherapy (Bayet, et al., 2010). 	<ul style="list-style-type: none"> 6000 mg per day for 7 consecutive days every 3 weeks along with standard docetaxel treatment.
		<ul style="list-style-type: none"> Topical treatment helped with external breast cancer lesions. 90% of individuals experienced a reduction in smell. Itching reduced in almost all cases. 70% of individuals experienced drying up of lesions. 10% of patients experienced reduction in lesion size and pain (Kuttan, et al., 1987). 	<ul style="list-style-type: none"> An ethanol extract of turmeric as well as an ointment of curcumin (its active ingredient) were found to produce remarkable symptomatic relief in patients with external cancerous lesions.
		<ul style="list-style-type: none"> A study published in the International Journal of Oncology, revealed that curcumin increases the apoptotic (apoptosis means "cell death") effect of paclitaxel (chemotherapeutic drug) in breast cancer and its concomitant use may reduce the toxicity of the therapy (Quispe-Soto, 2016). 	<ul style="list-style-type: none"> Curcumin and paclitaxel were evaluated with two human breast cancer cell lines as the luminal MCF-7 and the basal-like MDA-MB-231 that are either positive or negative for hormonal receptors estrogen receptor, progesterone receptor and HER2, respectively.

Cancer: Select Clinical Data (continued)

DISEASE	DURATION	BENEFIT	DOSAGE
Breast Cancer		<ul style="list-style-type: none"> • Researchers at the University of Rochester Medical Center have proven that daily supplementation of turmeric significantly reduces the rate of radiation dermatitis in patients suffering from breast cancer and receiving radiotherapy (Ryan, et al., 2013) 	<ul style="list-style-type: none"> • 2g curcumin three times a day (total 6g) and radiotherapy
Colo-rectal Cancer		<ul style="list-style-type: none"> • The body weight of curcumin patients increased by approximately 4% versus weight loss of 6% in the placebo group (He, et al., 2011). 	<ul style="list-style-type: none"> • 360 mg curcumin 3 times per day followed by radiotherapy, chemotherapy, chemoradiotherapy • Or no additional therapy
Lung Cancer	1 month	<ul style="list-style-type: none"> • Dietary turmeric can act as an effective anti-mutagen in smokers and can reduce the risk of lung cancer and cancer lesions (Polasa, et al., 1992). 	<ul style="list-style-type: none"> • 1.5g of turmeric for 30 days • Or control group
Multiple Myeloma		<ul style="list-style-type: none"> • Both 4g and 8g daily doses reduced the serum free light chain ratio (35% and 36%, respectively) and reduced total serum protein (P=0.04) in the urine in both MGUS and SMM patients Curcumin also decreased markers of bone turnover (urinary DPYD) and excretion of crosslinked N-telopeptides by more than 25% (Golombick, et al., 2012). 	<ul style="list-style-type: none"> • A double-blind placebo-controlled cross-over of 19 patients with MGUS and 17 patients with smoldering MM examined the effects of daily curcumin.
Pancreatic Cancer	12 months	<ul style="list-style-type: none"> • There was improvement of chemotherapy related symptoms after starting curcumin. The median survival after initiation of curcumin was 161 days. One-year survival rate was 19%. Median survival after gemcitabine is 70 days. (Kanai, et al., 2011). 	<ul style="list-style-type: none"> • 8g curcumin with gemcitabine (Gemzar)
Prostate Cancer	6 months	<ul style="list-style-type: none"> • Isoflavones and curcumin could modulate serum PSA levels. The authors of this study concluded that curcumin presumably synergizes with isoflavones to suppress PSA production (Ide, et al., 2010). 	<ul style="list-style-type: none"> • 100 mg of curcumin and 40 mg of isoflavones and placebo

Other Inflammatory Diseases: Select Clinical Data

Curcumin has exhibited powerful benefit to effectively manage a variety of inflammatory conditions.

DISEASE	DURATION	BENEFIT	DOSAGE
Arthritis	8 months	<ul style="list-style-type: none"> Improved joint pain, stiffness, physical function, social and emotional function (Belacore, et al., 2010). 	<ul style="list-style-type: none"> Curcuminoid and phosphotidylcholine 1000 mg curcuma extract 200 curcuma extract daily Standard conventional treatment
Allergic Rhinitis (AR)	2 months	<ul style="list-style-type: none"> Curcumin alleviated nasal symptoms (sneezing and rhinorrhea) and nasal congestion through reduction of nasal airflow resistance. This pilot study provides the first evidence of the capability of curcumin of improving nasal airflow and modulating immune response in patients with AR (Wu, et al., 2016). 	<ul style="list-style-type: none"> 241 patients with AR received either placebo or oral curcumin. The therapeutic effects of curcumin were evaluated by nasal symptoms and nasal airflow resistance.
Asthma	5 weeks	<ul style="list-style-type: none"> Findings suggest that curcumin administered through nasal route might prove therapeutically efficient in inhibiting allergic airway inflammation and maintaining structural integrity in the mouse model of allergic asthma. This may lead to the development of curcumin aerosol in the near future (Subhashini, et al., 2016) 	<ul style="list-style-type: none"> Mouse study; short exposure to ovalbumin (4 days) Repeated exposures for longer (twice per week until 5 weeks) represents chronic asthma Disodium cromoglycate (DSCG, 50mg/kg, i.p.) and dexamethasone (1mg/kg, i.p.) were used as standard drugs in acute and chronic model of asthma respectively
Cardio-vascular Disease	8 weeks	<ul style="list-style-type: none"> Adding curcumin to regular exercise provides enhanced CV fitness in postmenopausal women (Sugawara, et al., 2012). 	<ul style="list-style-type: none"> 150 mg curcumin with exercise training and placebo with exercise training
Diabetes	8 weeks	<ul style="list-style-type: none"> Significant increase in endothelial function in both the atorvastatin and curcumin groups. Additionally, all biomarkers decreased in the treatment group and no improvement in the placebo (Usharani, et al., 2008). 	<ul style="list-style-type: none"> 300 mg curcumin twice daily Atorvastatin 10 mg daily Or placebo
Irritable Bowel Syndrome	8 weeks	<ul style="list-style-type: none"> Prevalence of IBS decreased by 53% in the one tablet group and 60% in the two-tablet group. Additional abdominal pain and discomfort decreased (Bundy, et al., 2004). 	<ul style="list-style-type: none"> One of 72 mg or two tablets of 72 mg each, standardized turmeric extract taken daily for 8 weeks
Gastric Ulcer	Phase II	<ul style="list-style-type: none"> Ulcers completely healed in 48% after 4 weeks. and 76% after 12 weeks. (Prucksunand, et al., 2001). 	<ul style="list-style-type: none"> 600 mg with powdered turmeric 5 times/day Or placebo

Summary of Clinical Findings

The underlying effects of turmeric are: anti-inflammatory, anti-microbial, antioxidant, and wound healing. The clinical trial data suggest that turmeric either alone or in combination with conventional modalities reduces rates of morbidity or mortality from several disease states. The use of turmeric along with the conventional modalities produces better health outcomes and reduces the adverse events profile.

Using turmeric as a culinary spice and as a medicinal agent, may change the course of several chronic diseases such as arthritis, allergic rhinitis, asthma, cancer (breast, pancreatic, prostate, colorectal, lung, multiple myeloma) cardiovascular disease, diabetes, digestive disorders such as irritable bowel syndrome and gastric ulcer to name a few disease states. While it is not entirely clear as to how turmeric works, clinical trial data for cancer show its influence in inhibiting networks of cancer cell growth. Curcumin is a natural polyphenol molecule derived from the *Curcuma longa* plant which exhibits anti-cancer, chemo-preventive, chemo- and radio-sensitization properties. Curcumin increases the sensitivity of chemotherapeutic drugs and protects from toxicity of cancer therapy.

Dosage Range

Doses of 500-8,000 mg of turmeric per day have been used in human studies. Standardized extracts are typically used in lower amounts, in the 250-2,000 mg range (Alshuler, 2017).

Contraindications

Having been granted *Generally Recognized as Safe* (GRAS) status in the United States by the *Food and Drug Administration* (FDA), turmeric is well tolerated by most people. Turmeric usage should be avoided during pregnancy unless otherwise directed by a qualified expert. Therapeutic quantities should not be taken by people with bile duct obstructions or gallstones (Winston, 2014).

Toxicity

No significant toxicity has been reported following short- or long-term administration of turmeric extracts at standard doses.

Supplementation

Fresh turmeric root and dried powder are healthy to take daily. Please ask your health care provider if turmeric supplement is appropriate for you. For supplementation of curcumin, adding 1% *piperine* (black pepper) in the formulation can increase bioavailability by 2000%. Additionally, having some good quality fat such as ghee or butter can make the supplement more bioavailable.

Turmeric supplements have not been well studied in children. While there is no one single recommended dose for a child or adolescent, they can benefit from a reduced turmeric dose that can be calculated for each individual weight by dividing their weight with the average weight (in their gender) to determine the proportion of the adult dose that would be applicable. For example, if a boy or girl weighs 75 pounds (30 kgs), dividing that by the average gender weight in the U.S. would reduce the adult dose down to 38% for a boy and 45% for a girl. Apply this methodology to calculate the reduced turmeric dosage for your child or adolescent. The following doses are recommended as a guide for adults, children and adolescents.

Kitchen Medicine

Turmeric can be used as either fresh or dried and ground in curries, stir-fries, rice pilafs, grains such as millet and quinoa, and in tofu, smoothies, soups and drinks before bedtime. It is a great flavoring agent that can blend well with other spices from diverse geographic regions as its use has expanded beyond South Asia to all parts of the globe and incorporated into diverse local cuisines. Turmeric has been used as a natural additive in beauty products. Recipes are provided for experimentation as it is easy to incorporate in home cooking, by adding to vegetables, grains, beans, legumes, yogurt, meats, fish, and marinades.

Turmeric (Curcumin) Supplementation

Turmeric and curcumin, its most widely studied active constituent, can be taken as needed, as a dietary supplement. Recommended forms and dose ranges are indicated below.

TYPE OF SUPPLEMENT	ADULT	CHILD/ADOLESCENT MALE	CHILD/ADOLESCENT FEMALE
U.S. Average Weight (CDC)	Male:196 pounds (89 kg) Female:168 pounds (77kg)	How to calculate the proportional weight for boys? If boy's weight is 75 pounds (30 kgs), proportional dose calculation for curcumin is: $(75/196) = 38\%$. The below table illustrates dose levels for 38%.	How to calculate the proportional weight for girls? If a girl's weight is 75 pounds (30 kgs), the proportional dose calculation for curcumin is: $(75/168) = 45\%$. The below table illustrates dose levels for 45%.
Cut root	1.5-3g per day	.6-1.1g	.7-1.3g
Dried powdered root	1-3g per day	.3-1.1g	.4-1.3g
Standardized powder (curcumin)	400-600 mg, 3 times per day	153-230 mg	178-267 mg
Fluid extract	(1:1) 30-90 drops a day	11.5-34 drops per day	13-40 drops per day
Tincture	(1:2): 15-30 drops, 4 times per day	6-11 drops twice a day	7-13 twice a day



Dr. Ed in The Spice Shop, Kochi, India.

Turmeric Spice Blends

Madras Curry Powder

In traditional Indian cuisine the concept of curry powder does not exist. It was a term made popular by the colonial empire and anglicized to suit the Anglo Indian palate. It became popular in the British Raj where a mix of spices was used. Later curry became very popular in Britain and in other parts of the western world. What makes the madras curry powder different is the inclusion of mustard seeds and curry leaves. Here is a great recipe for curry powder.

YIELD: 1 CUP POWDER (Use ½ teaspoon per serving or as suggested in recipes.)

INGREDIENTS

2 tablespoons coriander seeds
1 tablespoon cumin seeds
1 teaspoon fenugreek seeds
4 dried red chilies
½ teaspoon fennel seeds
1 teaspoon mustard seeds
1 teaspoon ground black pepper
1 bay leaf
Seeds from 4 cardamom pods
4 whole cloves
1-inch (2.5 cm) cinnamon stick
2 teaspoons dried curry leaves
½ teaspoon sea salt
½ teaspoons ground turmeric

METHOD

1. Dry roast all the ingredients, except salt and turmeric, in a saucepan on a low heat until golden and fragrant.
2. Remove from heat and allow to cool.
3. When cooled, add turmeric and salt and process in a spice grinder to desired coarseness.
4. Stays fresh for 6 months if you store in a sealed container.
5. Use for curries.

SOURCE: Pramila Murthy

Sambhar Powder

Sambhar is delicious with vegetables and rice. Please explore with any vegetables and dal combinations from Brussels sprouts to okra, spinach, Swiss chard, potatoes, onions, green beans and carrots. You can cut this recipe in half, depending on your need for the Sambhar curry spice.

YIELD: 1-1½ CUP

INGREDIENTS

1 cup dried red chilies
¾ cup coriander seeds
½ teaspoon fenugreek seeds
1 teaspoon cumin seeds
½ teaspoon ground pepper, optional
½ teaspoon asafetida
¼ cup red gram (pigeon peas)

METHOD

1. Roast all ingredients to a light golden brown until fragrant.
2. Cool and grind into a smooth powder.
3. Store in a glass jar at room temperature.
4. Use it to make a *South Indian Sambhar* (see page 21).

SOURCE: Pramila Murthy

Tandoori Masala

Tandoori chicken is a dish Westerners think of when Indian food is mentioned. The smoky flavor of the tandoori meat or fish comes from the clay oven in which it is cooked, the slightly sour flavor from the spicing and yogurt marmalade. You can use this spice mixture for food cooked in the oven or over a grill.

YIELD: $\frac{1}{3}$ CUP POWDER (Use as indicated in tandoori recipes.)

INGREDIENTS

2 teaspoons cumin seeds	5-6 whole cloves
2 teaspoons coriander seeds	1 teaspoon black pepper
1 teaspoon fennel seeds	1 star anise
$\frac{3}{4}$ -inch (2 cm) cinnamon stick	2 blades mace
13-15 green cardamom pods	2 pieces dried ginger
3 black cardamom pods	6-8 whole dried red chilies
	1 teaspoon coarse salt

METHOD

1. Place all the ingredients in a sauté pan and dry roast until fragrant. Do not allow to burn.
2. Cool spices and place in a blender or spice grinder. Process until finely ground and pour into a glass jar.
3. Mark the jar with the date it was made and store in your pantry.
4. Retains optimum flavor for six months.

SOURCE: Recipe modified from Rimli Dey <https://youtu.be/ITiAzfTBdCQ>



Turmeric Beverages

Golden Milk

I (SM) grew up drinking this recipe with cow's milk, turmeric and black pepper. I have modified my grandmother's recipe to add cinnamon (both stick and powdered).

SERVES 1

INGREDIENTS

- 1 cup organic coconut milk
- 1 cinnamon stick
- 1 teaspoon ground turmeric
- ¼ teaspoon ground black pepper
- 10-12 strands of saffron
- ½ teaspoon cinnamon powder to sprinkle

METHOD

1. Heat coconut milk in a pan with the cinnamon stick.
2. Add the turmeric, pepper and saffron strands.
3. Pour the warmed golden milk into a mug.
4. Sprinkle with cinnamon powder and enjoy as a bedtime drink.



NOTE: *You can also try the above recipe with goat or cow's milk if you are not lactose intolerant. We recommend organic cow's milk to avoid growth hormone-injected cow's milk.*

Savory Cleansing Smoothie

This is my "go to" recipe to rehydrate after a workout. The fresh turmeric adds a rich savory taste.

SERVES 1

INGREDIENTS

- 1 medium apple
- ½ cup berries
- ½ cup celery
- ½ cup leafy greens
- 1-inch (2.5 cm) fresh ginger
- 1-inch (2.5 cm) fresh turmeric
- 2 tablespoons flax seeds
- 1 scoop protein powder
- 6 oz. kefir
- 3-6 oz. water or green tea

METHOD

1. Wash the apple, berries, celery and greens and roughly chop.
2. Peel the skin of the fresh ginger and turmeric and cut into smaller pieces.
3. In a blender, place a few ice cubes (optional) at the bottom, add all the ingredients and blend until smooth.



Turmeric Entrees

Brussels Sprouts Sambhar

A South Indian inspired creation, Sambhar is a staple for the region. You can substitute almost any vegetable to suit your tastes.

SERVES 4

INGREDIENTS

1 cup toor dal (split pigeon peas)
 1 tablespoon ground turmeric
 1 tablespoon tamarind, fresh or concentrate
 4 cups Brussels sprouts, sliced in half
 2 tablespoons ghee or extra-virgin coconut oil
 1 teaspoon mustard seeds
 1-2 tablespoons shredded coconut, grated fresh or dried (unsweetened)
 1-2 green chilies*
 A handful curry leaves
 1 pinch asafetida (optional)
 1-2 tablespoons sambhar powder, depending on heat tolerance
 Sea salt to taste

METHOD

1. Soak the toor dal (peas) for 3-4 hours. Rinse with fresh filtered water. Boil in 3-4 cups of water with the turmeric powder until soft. Add water, if it becomes too dry. Drain any excess water and set aside.
2. Soak the fresh tamarind in hot water for 10 minutes. If fresh is in season, otherwise use concentrate.
3. In a saucepan, steam the Brussels sprouts until bright green.
4. In a large sauté pan, gently heat the ghee or coconut oil until melted, add mustard seeds, chilies, curry leaves and asafetida. Stir to combine and heat until the spices release their scent (a few minutes).
5. Stir in the steamed vegetables and then add the dal.
6. Add the sambar powder and the soaked and drained fresh tamarind, or concentrate, and salt. Cook for 2-3 minutes to combine flavors.
7. Remove curry leaves. Sprinkle shredded coconut on top before serving.
8. Serve with quinoa, brown rice or millet and a side of green beans.

**If you can't find Indian chilies in your local market, you can use 1/2 Anaheim or 1-2 Thai chilies depending on your heat level tolerance.*



Turmeric Entrees (continued)

Chicken Tikka Masala

Chicken Tikka is seasoned chicken pieces cooked in a tandoor oven over high heat.

SERVES 4

INGREDIENTS

1 teaspoon Kashmiri red chili powder	1 tablespoon ginger garlic paste (equal parts garlic and ginger with salt)	2 tablespoons butter
Salt to taste		1 onion, thinly sliced
Juice of ½ lemon	2-3 tablespoons tandoori masala (see page 19)	2 tablespoons mint, minced
1 pound boneless chicken, cut into small pieces	1 teaspoon ground turmeric	
4 tablespoons yogurt	1 teaspoon kasuri methi (dried fenugreek powder)	
	1 teaspoon ground black pepper	

METHOD

1. Place Kashmiri red chili powder, salt and lemon juice in a large bowl. Add chicken, stir to coat pieces, cover and set aside for 30 minutes.
2. In a second bowl mix the yogurt, ginger garlic paste, tandoori masala mix, turmeric, kasuri methi, and black pepper. Add the chicken, cover and set aside again for 30 minutes.
3. You have two options for cooking. First, on the stove, using a griddle pan. Brush the grill with butter. Cook until browned. Flip and cook the reverse side.
4. The second method is in the oven if you don't have a griddle.
5. Preheat oven to 450°F (232°C). Arrange on a parchment lined baking sheet.
6. Bake the chicken for about 10 minutes, on one side. Flip and bake another 10-15 minutes. Broil the last 2 minutes for a little more color, being careful not to burn.
7. Serve the cooked pieces on a platter. Garnish with onions and fresh mint. Serve with mint chutney.

SOURCE: Recipe modified from Sanjeev Kapur Khazana: <https://youtu.be/uxJIXHH-Wys>

Delicious Daily Dal (Moong Dal)

A North Indian inspiration will go well with cauliflower curry and quinoa. You can substitute almost any dark leafy greens you can find.

SERVES 4

INGREDIENTS

1 cup moong dal (yellow lentils)
Filtered water for soaking and cooking
1 tablespoon turmeric powder
3 cups spinach (or Swiss chard or kale), chopped
2 tablespoons extra-virgin coconut oil
1 teaspoon cumin seeds
1 teaspoon cayenne pepper
1 pinch asafetida
Sea salt to taste

METHOD

1. Soak the dal (lentils) for 3 hours in a bowl of filtered water. Then cook with filtered water and turmeric. This is a relatively soft dal and cooks fast.
2. Steam or sauté the spinach or greens of your choice.
3. In a large sauté pan, heat the coconut oil on low and add the cumin seeds first, then the dal and the cooked greens.
4. Add the cayenne pepper, asafetida and salt last.
5. Taste and adjust seasonings.

Curried Cauliflower (Gobhi)

This is my (SM) favorite easy to make cauliflower recipe that is also flavorful and inspired by North Indian cuisine.

SERVES 4

INGREDIENTS

1 tablespoon ground turmeric
 1 tablespoon ground cumin
 1 tablespoon ground coriander
 1 teaspoon cayenne pepper
 1 tablespoon extra-virgin olive oil
 1 teaspoon cumin seeds
 2 small green chilies*, thinly sliced
 1 tablespoon fresh ginger, cut into thin strips
 1 medium head cauliflower, cut into florets
 2 tablespoons fresh cilantro, chopped and divided
 Sea salt to taste

METHOD

1. Combine turmeric, cumin, coriander and cayenne in a small bowl and set aside.
2. In a large pot or sauté pan, heat the olive oil on low for about a minute and then add the cumin seeds. Heat until the seeds start making popping sounds.
3. Add the sliced green chilies and fresh ginger strips. Cover the pan to allow them to soften for a minute or two.
4. Stir in the cauliflower florets.
5. After a minute add half the dried spices in the bowl, and some fresh cilantro leaves, saving the rest for garnish.
6. Stir and cover, continue cooking on low. After a few minutes stir in the remaining dried spices from your bowl.
7. Cover and cook on low heat for 5-10 minutes more or until cauliflower is tender.
8. Add sea salt to taste.
9. To serve, garnish with remaining fresh cilantro.

NOTE: To make this dish a meal, add cubed red skinned potatoes and peas to complement the spices and flavors.

**If you can't find Indian chilies in your local market, you can use Anaheim or Thai chilies depending on your heat level tolerance.*



Turmeric Entrees (continued)

Fenugreek Pilaf (Methi Garlic Pulav)

Fenugreek leaves, when combined with garlic and basmati rice, exude a rich aroma. If not available, you can substitute kale, spinach or Swiss chard.

SERVES 4

INGREDIENTS

2 cups basmati brown rice
1 tablespoon ghee
2 tablespoons extra-virgin olive oil
½ teaspoon asafetida
½ teaspoon cumin seeds
12 cloves garlic, crushed or chopped fine
1-inch (2.5 cm) ginger, minced or grated
3 green chilies*, thinly sliced
2 large bundles methi or fenugreek leaves, rinsed well and roughly chopped
3-4 medium tomatoes, diced medium
½ teaspoon ground turmeric
1½ teaspoon chili powder
Sea salt to taste
1 cup peas, thawed if frozen

METHOD

1. Wash the basmati brown rice and soak for 3-4 hours.
2. In a heavy pot, over low heat, melt the ghee and extra-virgin olive oil. Add the asafetida, cumin, garlic, ginger and chilies. When the garlic starts to take on color, add the methi leaves and allow to soften for a couple of minutes. Add the tomatoes and continue to sauté until they break down.
3. Add the ground turmeric and chili powder and stir for a minute or two.
4. Add the basmati brown rice and sauté for a few more minutes. Then add the salt and four cups of boiling water.
5. Raise the heat and bring to a boil. Then cover and reduce heat to low for approximately 40-45 minutes until the rice is soft. Stir in the peas in the last five minutes.

NOTE: *This can be served with raita (yogurt sauce) Accompaniments can be the dal for protein and vegetables for fiber.*

**If you can't find Indian chilies in your local market, you can use 1 Anaheim or 3 Thai chilies depending on your heat level tolerance.*

SOURCE: Modified from Moorthy, V., *The Vegetarian Menu Book, A Comprehensive Guide to Authentic Indian Vegetarian Cuisine*. UBS (1993);

Green Bean Supreme

Green bean curry with rice or quinoa makes a deliciously satisfying meal.

SERVES 2

INGREDIENTS

2 tablespoons extra-virgin coconut oil
1 teaspoon mustard seeds
1-2 green chilies, thinly sliced
A handful of curry leaves
1 teaspoon turmeric powder
1 pinch asafetida (optional)
2 cups green beans, minced fine
1-2 tablespoons fresh grated coconut
or dried unsweetened
Sea salt to taste

METHOD

1. In a sauté pan, heat the coconut oil, add the mustard seeds, chilies, curry leaves, turmeric and asafetida if using. Stir to combine and heat until the spices release their scent (a few minutes).
2. Add the greens beans, stir and cover. Add the coconut and salt and cook for 5 minutes more.
3. Remove curry leaves. Taste and adjust seasonings.
4. Serve with quinoa, brown rice or millet and "Brussels Sprouts Sambhar" (see page 21).

Savory Sauté

This versatile, nicely spiced recipe can be made with your choice of protein and vegetables.

SERVES 2

INGREDIENTS

8 oz. extra firm tofu or chicken	2 teaspoons sesame seeds	½ cup onion, minced	½ cup mushrooms, sliced
1 teaspoon cumin powder	Juice of ½ a lemon	2 teaspoon ginger, minced	2 tablespoon cilantro, minced
1 teaspoon coriander powder	2 tablespoons extra-virgin olive oil, divided	2 cloves garlic, minced	Sea salt to taste
½ teaspoon garam masala	1 teaspoon cumin seeds	1 cup spinach, roughly chopped	4-6 lettuce leaves

METHOD

1. Cube the tofu into ½-inch (1.27 cm) squares or slice chicken into strips.
2. Prepare a marinade with the cumin, coriander, garam masala, turmeric, sesame seeds, lemon juice and half the oil. Add chicken or tofu and set aside.
3. Heat the remaining oil over medium high heat in a sauté pan or wok and add the cumin seeds.
4. Once they start to pop, add the onions and sauté for a minute. Lower the heat to medium and add ginger and garlic, taking care not to burn the garlic.
5. When the onions are starting to soften, add the mushrooms and cook until golden. Stir in the spinach and cilantro until wilted. Add the tofu or chicken last.
6. Sauté for 2-3 minutes, or until chicken is cooked, then add remaining marinade and sea salt. Stir to combine. Taste and adjust seasonings.
7. To serve, take a lettuce wrap and add the tofu or chicken mixture and enjoy.

Turmeric Vinaigrette

Adding turmeric to a salad dressing or sauce offers a tangy flavor and bright orange color.

SERVES 4

INGREDIENTS

¼ cup vinegar
1 tablespoon maple syrup
1-2 cloves garlic, minced
1 tablespoon green herbs
1 tablespoon chia seeds
½ teaspoon salt
1 teaspoon turmeric
½ cup extra-virgin olive oil

METHOD

1. Mix all the ingredients in a blender except the oil. Turn on the machine and slowly add the oil until dressing is emulsified.
2. Store in a glass container until ready to serve.



How to Grow Turmeric

Healthy herbs, grown in healthy soil, provide concentrated macro- and micro-nutrients, volatile oils and bioflavonoids that support tissue growth and repair, improve circulation, enhance digestion, absorption and cellular detoxification. They are nature's antidote to pollution, stress, and malnutrition that lead to chronic inflammation, which over time leads to depletion of our nervous, endocrine, immune, respiratory and muscular skeletal systems.

Turmeric is easy to grow in your home garden or greenhouse, if the soil is loamy, and there is



sufficient heat and water during the warm weather months. The roots form an underground network, which will spread into a garden plot or field if you allow it. The chopped leaves can be added to herbal tea (Bernhardt, 2008).

Similar to ginger, turmeric is grown from *rhizomes* (root cuttings). Turmeric does not propagate seeds. All you need is one turmeric root which you can find at your local healthy food market.

To grow turmeric indoors, just follow these simple steps:

- Break a larger rhizome into a small rhizome piece that has two or three buds.
- Fill your pots with rich organic soil, which is slightly moist, but well drained.
- Place the rhizome pieces about 2 inches (5 cm) below the surface of the soil, with the buds facing up.
- Water the container.
- Turmeric will benefit from bi-monthly feedings of a good organic fertilizer or compost tea.

How to Water Turmeric

Turmeric likes water. Keep the soil moist, particularly in hot, dry climates. Try watering it once every 2 days or misting with a spray bottle. If you live in cooler climates, water less frequently. The key here is to keep the soil from ever getting soggy.

How to Harvest Turmeric

- Turmeric takes 8-10 months for the edible rhizomes to mature. While the leaves and stems are edible, most people harvest turmeric only for its roots. Most herbs can be harvested throughout the growing season, but turmeric root is best if harvested all at once when mature.
- When the rhizomes are large enough, dig up all rhizomes from the pot. They are best if all harvested at once.

How to Grow Turmeric (continued)

- Dig up the rhizomes and save a few pieces to plant for the following season. Make sure to change the soil, though, because the original plant probably depleted it of all its nutrients.
- Turmeric roots should be kept in a cool, dry place until use.

How to Make Turmeric Powder

When you are ready to use them, follow these directions:

1. Boil the roots for 45 minutes. Peel the roots, wearing gloves to prevent dyeing your hands bright yellow.
2. Dry the turmeric for approximately one week, or dehydrate in an oven at 200°F (93°C) for 2 hours.
3. Grind the peeled rhizomes into the lovely spice that is used in so many recipes.



SOURCE: dailyhealthpost

Sunburn Support and Exfoliant

This recipe is from my mother's armamentarium of using turmeric if you have had a sunburn.

SERVES 1

INGREDIENTS

¼ cup extra-virgin coconut oil
1 teaspoon ground turmeric
¼ cup wheat flour
Water to mix

METHOD

1. Apply coconut oil liberally on your body.
2. Mix turmeric with flour and water.
3. Apply on the oiled surface.
4. Let sit for 2-3 minutes.
5. Remove using an exfoliating motion. Take a tepid to cool shower.

SOURCE: Pramila Murthy



CHAPTER TWO

Basil

*(Ocimum basilicum/
sanctum/tenuiflorum)*

Basil is at the top of the green herbal pantheon. It is beautiful, aromatic, and divinely refreshing. Laboratory science cannot do justice to the energy and effect varieties of basil have on the body, mind, heart and spirit of human beings, toiling away in a largely plant-deficient world.

Growing fresh basil, be it Tulsi holy basil or sweet basil, is a blessing and a healing balm. Research on Tulsi holy basil demonstrates its many psychological and physiological benefits. All varieties of basil are soothing, healing and restorative to the blood and brain due to its rich chlorophyll and mineral content.

Hinduism and Ayurveda celebrate Tulsi as a plant to be worshipped, ingested, and made into tea. Sweet basil has been revered throughout time, culture and history, in Europe and the Mediterranean countries. Both sweet basil and Tulsi holy basil have unique benefits they offer by way of their fragrant essential oils.

Basil is great to include in our day-to-day cooking, whether fresh or dried. I suggest growing basil as a kitchen spice in a pot as it is quickly eaten by all varieties of outdoor animals when grown in an unprotected garden. Basil loves the sun and generates a sunny mood when noticed by the eye, inhaled by the nose or tasted on the tongue. I use fresh basil as a garnish to top a soup, salad or main dish. I also use it to add fresh flavor to breakfast smoothies and fruit salads.



Dr. Ed at Akha Cooking School, Chaing Mai, Thailand.



Thai Basil



Tulsi Holy Basil

Background and Uses

Belonging to the genus *Ocimum*, sweet basil is a diverse aromatic herbaceous plant. Over 150 types of basil are grown for their aromatic leaves and volatile oils. One commonly grown variety, sweet basil (*Ocimum basilicum* Linn) is an annual plant grown for its rich green plants and intense flavor. Belonging to the family of mint (Lamiaceae), sweet basil is used fresh or dried in preparing soups, salads, pesto, sauces and stir-fry dishes of Mediterranean and world cuisine. I (SM) love the flavor of fresh sweet basil. I grow it in my backyard each year. I enjoy using it fresh in salads, pesto and to flavor olive oil. Other types of basil commonly used in soups, salads and stir-frys are lemon basil (*Ocimum citriodorum*), Thai basil (*Ocimum basilicum* variant *thyrsoiflora*), and Tulsi holy basil (*Ocimum tenuiflorum*), a key ingredient in Thai, Vietnamese, Indonesian, Chinese and Laotian cuisine.

The origins of basil are attributed to India and Indonesia dating back 5,000 years. It was likely introduced in Europe by Greeks and Romans, coming from commercial routes originating in the Middle East. Genus *Ocimum* (sweet basil) is now cultivated in many Asian, Western and Mediterranean countries. The main exporters for the European market are France, Italy, Morocco and Egypt. There is also significant basil production in California.

A remarkable cultivar of this family is Tulsi holy basil (*Ocimum Sanctum* Linn or *Ocimum Tenuiflorum*), native to South Asia. Growing up in India I (SM) experienced this plant in my Grandmother, Jayakka's backyard where a special box-like structure was built to house her precious tulsi. She cared for the perennial tulsi plant and container at her Bangalore home, in tropical southern India. For years, she prayed to the Goddess Tulsi and performed daily *puja* (prayer) ceremonies. Tulsi was not used in her cooking, nor in that of her neighbors. It was first and foremost a ceremonial plant. Secondly, it was used for medicine. If someone experienced a sore throat or early onset of a cold, tulsi leaves were prepared to make a "Kashayam." For this preparation, tulsi leaves alone or in combination with other herbs, were boiled, reduced by heating for 20 minutes or more, and ingested warm

with a touch of honey. Within hours or days, sore throat and cold symptoms diminished or disappeared altogether.

Tulsi has been used in Ayurvedic therapy for numerous health conditions as a medicinal tea or extract, alone, or with other ingredients. Scientific findings have been widely reported on its salutatory benefits as an adaptogen (stress mediator) that is immunomodulatory, anti-inflammatory, anti-carcinogenic, hepato-protective, cardio-protective, neuro-protective, anti-microbial, and anti-diabetic.

Plant Specifics

Basil is cultivated worldwide as an annual or perennial plant. There are several varieties, differing in the size, shape, odor and color of the leaves. Many varieties have different compositions and flavoring characteristics. Basil is strongly affected by environmental factors like temperature, geographic location, soil and amount of rainfall. Its thin branching root produces bushy stems growing from 1-2 feet high and bearing leaves of a purple hue, and two-lipped flowers, varying in color from white to red, sometimes with a purple tinge. All parts are utilized including leaves; flowering tops, essential oil, and the entire herb (all aerial parts) are harvested. Best harvesting season is before flowering. Basil leaves should always be used fresh, as they lose much of their flavor within a few weeks after drying. Basil can be dried and ground into a powder to be used in herbal formulas.

Active Constituents

Sweet Basil (*Ocimum Basilicum* Linn): Sweet basil contains a volatile oil about 1%, which consists principally of linalool and methyl chavicol, along with small quantities of methyl cinnamate, cineole, and other terpenes. The essential oil (less than 1%) is of complex and variable composition. Within the species, several different chemical alkaloids exist, whose potency depends upon climate, soil and time of harvest that influence not only the amount of leaf produced by a plant, but also the composition and potency of its essential oil.

Tulsi Holy Basil (*Ocimum Sanctum Linn* or *Ocimum Tenuiflorum*): The primary phytochemical constituents of tulsi are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, β -caryophyllene (about 8%). (Rai, et al., 1997) Tulsi holy basil leaf active essential oils consist of eugenol (~70%) β -elemene (~11.0%), β -caryophyllene (~8%) and germacrene (~2%), with the balance being made up of various trace compounds, mostly terpenes (Sen, et al., 1992).

Tulsi Uses in Traditional Medicine

In Ayurveda, Tulsi holy basil is referred to as “The Incomparable One,” “The Queen of Herbs” and revered as “The Elixir of Life.” Daily consumption of Tulsi holy basil is renowned to be health enhancing and disease preventive. In traditional natural medicine, it is recommended to manage bronchitis, bronchial asthma, chronic fever, malaria, dysentery, arthritis, skin diseases, and painful eye diseases. Eugenol, the active constituent present in Tulsi holy basil, is largely responsible for its therapeutic effects.

Tulsi Uses in Western Medicine

The medicinal properties of Tulsi holy basil are being studied in hundreds of scientific studies. In vitro, and animal experiments and human trials have documented its value as being anti-diabetic, anti-arthritic, hepato-protective (protects against liver damage), anti-cancer, chemo-preventive, radio-protective, cardio-protective, anti-hypertensive (lowers high blood pressure), anticoagulant activities (blood thinner) anti-hypercholesterolemia (prevents excess cholesterol in blood), antidepressant, anti-stress, anti-thyroid, infertility, anti-diarrheal, anti-ulcer, anti-asthmatic, anti-pyretic (fever reducing), anti-spasmodic (reduces muscle spasms), anti-emetic (reduces vomiting and nausea), anthelmintic (expels worms and parasites), anti-bacterial, anti-viral, antitussive (cough suppressant), anti-malarial, antioxidant, anti-cataract, anti-allergic and memory enhancer (Cohen, 2014).

Health Benefits of Tulsi Holy Basil

Tulsi Holy Basil (*Ocimum sanctum Linn*)

- Promotes well-being and improves resilience, by modulating the body’s response to stress and promoting a recuperative homeostasis after a disturbing stimulus.
- Helps the body correct blood sugar irregularities associated with the metabolic syndrome and mitigates its consequences.
- Studies have shown that Tulsi holy basil can reduce blood glucose, correct abnormal lipid profiles, and protect the liver and kidneys from the metabolic damage caused by high glucose levels.
- In human clinical trials, Tulsi holy basil has been shown to decrease glucose levels, improve blood pressure and lipid profiles and reduce many symptoms experienced by patients with type-2 diabetes (Cohen, 2014).
- Has been reported to prevent cancers caused by toxic compounds by reducing DNA damage and inducing apoptosis in pre-cancerous and cancerous cells, thereby reducing the growth of experimental tumors and enhancing survival (Cohen, 2014).
- Has been cited in various studies to stabilize gene expression altered both by cancer and radiation therapy (Jockers, 2017; Gunes, 2016).
- Has demonstrated antibacterial, antiviral and antifungal activity that includes activity against many pathogens responsible for infections (Cohen, 2014).

Clinical Trial Data for Tulsi Holy Basil (*Ocimum Sanctum* Linn)

Holy Basil is a classic Ayurvedic remedy. Below are data on recent clinical applications.

THERAPEUTIC AREA	STUDY	BENEFIT	DESCRIPTION
Generalized Anxiety Disorder	Human trial 2 months	<ul style="list-style-type: none"> The study showed that, <i>Ocimum Sanctum</i> (OS) significantly lowered anxiety, stress and depression. The study concluded that OS may be useful in the treatment of lowering stress and anxiety from Generalized Anxiety Disorder (Bhattacharya, et al., 2008). 	<ul style="list-style-type: none"> Study sample = 35 (21 male and 14 females; average age 38.4 years) Two groups Male and Female: Given plant extracts of OS in a fixed oral dose regime 500 mg 2 times/day
Diabetes type-2	Human trial 30 days	<ul style="list-style-type: none"> The experimental group receiving <i>Ocimum Sanctum</i> (OS) exhibited a reduction in fasting blood glucose levels. Additionally, there was a significant reduction in the levels of total cholesterol, LDL-cholesterol, VLDL-cholesterol and triglycerides after supplementation with OS powder. Meanwhile, the control group had higher levels of glucose (Rai, et al., 1997). 	<ul style="list-style-type: none"> All diabetics, total sample size = 27 (M = 17 & Female = 10) type-2 diabetes All patients to take 1g of OS powder, first thing in the morning
Immunomodulatory	Human trial 4 weeks	<ul style="list-style-type: none"> There was a statistically significant increase of IFN-γ, T-helper cells and NK-cells in the intervention group that took <i>Ocimum Sanctum</i> (OS) leaves in contrast to the placebo group. They are supportive of a healthy immune system (Mondal et al., 2011) 	<ul style="list-style-type: none"> Double blind, randomized control trial on 24 healthy volunteers Daily intake of 300 mg ethanolic extract of OS leaves on an empty stomach or placebo
Stress	Human trial 6 weeks	<ul style="list-style-type: none"> The study demonstrated that lower levels of stress were observed in the control group taking <i>Ocimum Tenuiflorum</i> (OT). There was also significantly less forgetfulness and sexual dysfunction observed in the control group. The extract was well tolerated for the six weeks (Saxena, et al., 2012). 	<ul style="list-style-type: none"> Extract of OT An adult study, Sample sizes: placebo = 79 OT extract = 71; were given 1,200 mg of extract daily for 6 weeks
Gastric Ulcer	Rat study 5 days	<ul style="list-style-type: none"> Optimal effective dose 100 mg/kg of <i>Ocimum Sanctum</i> (OS) extract showed significant ulcer protection and significantly healed ulcers (Goel, et al., 2005). 	<ul style="list-style-type: none"> The standardized methanolic extract of leaves of OS eugenol content 5% given in doses of 50-200 mg/kg, orally, twice daily for 5 days.
Anti-inflammatory	Rabbit Study	<ul style="list-style-type: none"> Anti-inflammatory effects were observed in all compounds tested. The study suggests <i>Ocimum Sanctum</i> (OS) extracts had the same benefit as ibuprofen, naproxen and aspirin and could potentially be used for inflammation and pain (Kelm, et al., 2000). 	<ul style="list-style-type: none"> Extraction of 6 compounds from OS

Cancer Clinical Trial Data for Tulsi Holy Basil (Ocimum Sanctum Linn) – (continued)

Therapeutic Area	Study	Benefit	Description
Prostate Cancer	Prostate Cancer Cell Study 24-48 hours	<ul style="list-style-type: none"> This study focuses on apoptosis-inducing ability of <i>Ocimum Sanctum</i> (OS) extract on prostate cancer cells. Findings suggest that, ethanolic extract of OS can effectively induce apoptosis, leading to cell death in prostate cancer cells (Dhandayuthapani, et al., 2015). 	<ul style="list-style-type: none"> Prostate cancer cells were treated with different concentrations of 70% ethanolic extract of OS and then the cytotoxicity was determined after 24 and 48 hours.
Breast Cancer	Breast Cancer Cell Study	<ul style="list-style-type: none"> The study found that <i>Ocimum Sanctum</i> (OS) inhibited proliferation of breast cancer cells. The study findings indicate that OS has the ability to cause apoptosis and reduce proliferation of breast cancer cells, suggesting its potential for use as an anti-cancer agent (Manaharan, et al., 2016). 	<ul style="list-style-type: none"> Essential oil OS was extracted using hydro-distillation of the leaves. Cell proliferation was measured at different concentrations
Oral Cancer	Oral Cancer Cell Study	<ul style="list-style-type: none"> The antiproliferative activity of <i>Ocimum Tenuiflorum</i> (OT) on oral cancer cell line was evaluated. The aqueous extract of OT of Krishna and Rama Tulsi exhibited significant anti-proliferative properties, causing apoptosis in oral cancer cell line, suggesting the potential for use as an anti-cancer agent (Shivpuje, et al., 2015). 	<ul style="list-style-type: none"> Aqueous and dry extract of OT with both Krishna Tulsi and Rama Tulsi leaves were prepared.
Pancreatic Cancer	Pancreatic Cancer Cell Study	<ul style="list-style-type: none"> <i>Ocimum Sanctum</i> (OS) leaf extract inhibit the proliferation, migration, invasion, and induce apoptosis of pancreatic cancer cells. Overall, the study suggests that leaves of <i>Ocimum Sanctum</i> (OS) could be a potential source of novel anti-cancer compounds in the future (Shimizu, et al., 2013). 	<ul style="list-style-type: none"> OS leaf extract
Lung Cancer	Lung Cancer Cell Study	<ul style="list-style-type: none"> Overall, the results demonstrate that <i>Ocimum Sanctum</i> (OS) ethanol extract induces apoptosis in lung cancer cells suggesting that it can be applied to lung carcinoma as a chemopreventive candidate (Magesh, et al., 2009). 	<ul style="list-style-type: none"> OS ethanol extract
Skin Cancer	Mice Study	<ul style="list-style-type: none"> The study concluded that leaf extract of <i>Ocimum Sanctum</i> (OS) provides protection against proliferation of skin cancer cells (Rastogi, et al., 2007). 	<ul style="list-style-type: none"> Alcoholic extract of the leaves of OS

Summary of Clinical Findings

Tulsi holy basil (*Ocimum Sanctum Linn*): Numerous clinical trials indicate the stress lowering property of Tulsi holy basil, and its value in managing anxiety disorder and depression. Tulsi has been safely and reliably used to lower serum glucose levels, serum triglycerides, and are found to be cardio-protective. Tulsi's anti-inflammatory effect enables it to be efficacious in healing ulcers and useful as a mild analgesic.

In select cell studies of prostate, breast, pancreatic, oral, lung, and skin cancer, tulsi has demonstrated benefit-inducing apoptosis to contain the proliferation of cancer cells. Tulsi has been shown to minimize the side effects of radiation therapy and stabilize healthy cell gene expression. Too few oncologists and persons suffering with cancer know of the significant benefit tulsi can provide them to slow cancer progression and protect healthy cells from aggressive treatment side effects. Clearly, more human trials are required to explore the optimal dose, duration and synergistic use of tulsi with other plants such as turmeric, ashwagandha, and others with organ and endocrine specificity.

Health Benefits

Sweet Basil (*Ocimum Basilicum Linn*): Historically, touted by the Greeks, Romans and Egyptians as an herb worthy of kings, sweet basil has been used in cooking sumptuous foods. Its volatile oils, used in ancient religious ceremonies and embalming, were considered a symbol of fertility. While sweet basil has not been studied extensively by modern medicine, it has been found to be beneficial for preventing and managing common ailments due to its antioxidant properties.

- Has shown potential for use in acne control.
- Has been used as an essential oil inhalant to reduce the stress from mental exhaustion and burnout.
- Can serve as an insect repellent for prevention of malaria and dengue.
- Has potential for heart health, in the treatment of hyperlipidemia.

Summary of Clinical Findings

Far too little research has been done investigating the preventive and healing benefits of sweet basil. Its strong aromatic oil has been found to be beneficial in acne prevention, useful as an insect repellent, in lowering of mental stress, and in the treatment of heart health and circulation.

Dosage Range: Sweet Basil

There is no supplemental dose range for Sweet Basil in the scientific literature.

Dosage Range: Tulsi Holy Basil

Doses of 300-2,500 mg of Tulsi holy basil (*Ocimum Sanctum Linn*) per day have been used in human studies. Standardized extracts are typically used in lower amounts, in the 250-2,000 mg range (Yates, 2017).

Contraindications

Having been granted *Generally Recognized as Safe* (GRAS) status in the United States by the *Food and Drug Administration* (FDA), Tulsi holy basil (*Ocimum Sanctum Linn*) is well tolerated by most people.

Patients with known allergy hypersensitivity to *Ocimum sanctum Linn*, its constituents or to members of the Lamiaceae family, should avoid using this botanical agent. The plants included in the Lamiaceae are mints and balms.

Based on animal studies, use Tulsi cautiously for:

- Patients with hypoglycemia.
- Patients with bleeding disorders or those taking anti-coagulant or antiplatelet drugs.
- Patients who want to conceive a child due to possible anti-spermatogenic or anti-fertility effects at higher dosages.
- Pregnant and breast-feeding women, as Tulsi holy basil may stimulate uterine contractions, based on traditional use (Yates, 2017).

Clinical Trial Data for Sweet Basil (Ocimum Basilicum Linn)

Below are data on the benefit of sweet basil for managing common conditions.

Therapeutic Area	Study	Benefit	Description
Acne	Human Trial 8 weeks	<ul style="list-style-type: none"> Experimental study of three gel formulations on 28 volunteer patients, separated into 4 groups of 7 patients. All groups reported an improvement of the acne condition (Matiz, et al., 2012). 	<ul style="list-style-type: none"> Orange (<i>Citrus Sinensis</i>) and sweet basil (<i>Ocimum Basilicum</i>) essential oils were tested. Treatments were applied daily for 8 weeks.
Mental Exhaustion and Burnout	Human Trial 3 weeks	<ul style="list-style-type: none"> The aromatherapy group taking <i>Ocimum Basilicum</i> (OB) had a much greater reduction. The results suggest that inhaling essential oils may reduce the perceived level of mental fatigue and burnout. (Matiz, et al., 2012) 	<ul style="list-style-type: none"> Study was a randomized, controlled, double-blind pilot study. Data was collected for 3 weeks. Participants used an OB personal inhaler at home or at work.
Insect Repellant	Lab Study Mosquitoes	<ul style="list-style-type: none"> This study tested against three mosquito species, <i>Aedes aegypti</i>, <i>Anopheles minimus</i> and <i>Culex quinquefasciatus</i>, under laboratory conditions. Both substances were effective as repellents and feeding deterrents against all three mosquito types (Phasomkusolsil, et al., 2010). 	<ul style="list-style-type: none"> Insect bite protection and length of protection with repellents was tested. Phlai (<i>Zingiber cassumunar</i>) and Sweet basil (<i>Ocimum Basilicum</i>) whose oils were included.
Atherosclerosis	Rat Study 7-24 hours	<ul style="list-style-type: none"> This study evaluated the lipid lowering effect of aqueous <i>Ocimum Basilicum</i> (OB) extract. The results indicated that <i>Ocimum Basilicum</i> (OB) may contain hypolipidemic and antioxidant substances and its use as a therapeutic tool in hyperlipidaemic subjects may be of benefit. (Amrani, et al., 2006) 	<ul style="list-style-type: none"> The animals were given 200 mg/kg of the OB extract.

Toxicity

No significant toxicity has been reported following short- or long-term administration of Tulsi holy basil at standard doses.

Supplementation

Tulsi holy basil (*Ocimum Sanctum Linn*) has very low toxicity, providing general beneficial effects without adverse events. The Tulsi holy basil leaves offer a rich source of essential oil, containing eugenol, nerol, camphor and a variety of terpenes and flavonoids. The oil is a strong antiseptic against many kinds of disease causing organisms. Tulsi holy basil comes in the following forms: fresh, dried leaf, capsules, extract and tincture. The dosing is best determined by your health practitioner based on your height, weight, age, and health status.

Holy Basil (*Ocimum Sanctum Linn*)

Supplement Recommendation

Holy basil supplement forms and dose ranges are indicated below.

THERAPEUTIC AREA	STUDY	BENEFIT
For Prevention	300 mg-2,000 mg once daily	Extract
For Therapy	600-1,800 mg daily in divided dosages	Extract
For Diabetes	2,500 mg or 1 teaspoon of dried herb brewed daily in 1 cup of water, 2-4 times per day	Dried leaf

SOURCE: (Yates, 2017)

Summary

Tulsi Holy Basil (*Ocimum Sanctum Linn*): Modern scientific studies have demonstrated that Tulsi holy basil is effective in treating a range of stressful conditions. Within Ayurveda, it is more commonly recommended as a preventive measure to enhance the ability to adapt to both psychological and physical stress and therefore prevent the development of stress-related diseases. Both of these findings are significant. Clin-

ical trial data are indicative of the broad power and diverse health benefits of Tulsi holy basil. Tulsi is not widely used in western clinical medicine despite the data we have presented. Tulsi is affordable, accessible and very palatable as a tea or extract. We recommend daily consumption of Tulsi holy basil tea as a foundational diet and lifestyle practice.

Sweet Basil (*Ocimum Basilicum Linn*): Sweet basil has been a staple spice in Mediterranean and global healthy cuisine. It, too, is affordable, accessible and safe to use on a daily basis. Modern day trials are limited, but promising. We recommend using it in your everyday cooking, preferably fresh and uncooked or lightly heated.

Kitchen Medicine

We have showcased several cultivars of basil. Feel free to experiment with different varieties either fresh or dried basil in any dish, using sweet or spicy herbs and spices. You can also include sprigs of fragrant basil in fresh floral arrangements.

Tulsi Holy Basil: Regular consumption of Tulsi holy basil is nourishing to the body, mind and spirit, while fostering a sense of relaxation and well-being. It has a calming effect that leads to clarity of thought, along with a more relaxed and calm disposition. The cognitive and memory-enhancing properties of Tulsi holy basil differ from caffeine beverages such as coffee and tea, which stimulates the nervous system and may cause physical and mental agitation, plus blood sugar decline several hours after ingestion. Tulsi holy basil does not produce the same physical dependence as caffeine and can be safely consumed on a regular basis. Powdered Tulsi is stronger than dried Tulsi.

Sweet Basil: Combines nicely with virtually all herbs, especially rosemary, thyme, oregano and marjoram. Experimentation is the best way to determine how much seasoning tastes best to you and for your meal mates. Sweet basil combines with virtually all spices especially with thyme and marjoram and with pungent and sweet spices. A good rule of thumb for using dried basil is 1 teaspoon to 1 tablespoon for a dish that serves 4 people.

Basil Remedies

Tulsi and Ginger Tea

I (SM) drink this combination at least once daily. It is calming and caffeine free.

SERVES 1

INGREDIENTS

1 cup of water
 ¼ teaspoon dried ginger or
 1 tablespoon fresh ginger
 ½-1 teaspoon dried or 2 tablespoons
 fresh Tulsi holy basil leaves
 ½-1 teaspoon freshly squeezed
 lemon to taste (optional)
 ½-1 teaspoon honey (optional)

METHOD

1. In a cup of water, boil the ginger root or powder for 5 minutes.
2. Add the dried or fresh tulsi leaves and steep 3-5 minutes.
3. Strain the solids and drink hot.
4. Add lemon and honey if you wish or store in the refrigerator for a cool drink in the summer.

NOTE: *Finer powdered Tulsi will yield a stronger brew than coarse dried tulsi.*

Tulsi Kashayam (For Cough and Cold)

Kashayam is an Ayurvedic home remedy for the common cough and cold. Sip on the warm beverage twice a day for relief from symptoms.

SERVES 1

INGREDIENTS

2 tablespoons dried
 or ⅓ cup fresh Tulsi
 holy basil leaves
 ¼ teaspoon ajwain
 (if available, also
 called carom seeds)
 1 teaspoon honey
 200 ml water

METHOD

1. Toast the ajwain and dried Tulsi, if using (but not the fresh)
2. Heat the water and add the dried Tulsi and ajwain mixture. If using fresh, remove leaves and discard stems.
3. Bring the mixture to a boil. Allow to slightly cool.
4. Strain the solids, add the honey and drink hot.
5. Can be stored up to 3 days.

Tulsi (For Cough and Sore Throat)

I (SM) have used fresh tulsi leaves as indicated below to alleviate a cough and sore throat. It has reduced the severity and duration of both.

SERVES 1

INGREDIENTS

6-12 fresh Tulsi holy basil
 leaves

METHOD

1. Fold the leaves into a ball and chew on them.



Basil Remedies (continued)

Tulsi Kashayam (For Cough, Cold, and Flu)

This more complex variation is also good for indigestion and the flu.

SERVES 1

INGREDIENTS

- 2 tablespoons dried or 1/3 cup fresh Tulsi holy basil leaves
- 1 tablespoon black peppercorns
- 1 tablespoon cumin
- 1 tablespoon coriander seeds
- 1 tablespoon fresh ginger
- 1 tablespoon fresh mint leaves
- 2 cups (500 ml) water
- 1 freshly squeezed lemon to taste
- 1 teaspoon honey

METHOD

1. Dry roast all the dried spices in a pan until fragrant. Set aside to cool slightly.
2. Bring water to boil, add all the fresh and dried ingredients and boil until the decoction is reduced to half.
3. Strain the solids and drink hot.
4. Add lemon and honey if you wish or store in the refrigerator for a cool drink in the summer.

Basil Beverages

Basil Ginger Smoothie

This is my favorite recovery drink after a workout. Adding fresh turmeric provides a savory taste and healing benefit.

SERVES 1

INGREDIENTS

- | | |
|---|--|
| 1 medium apple | 1-inch (2.5 cm) fresh turmeric, peeled |
| 1/2 cup celery | 2 tablespoons fresh sweet basil leaves or 1/2 tablespoon dried sweet basil |
| 1/2 cup leafy greens | 2 tablespoons flax seeds |
| 1/2 cup berries | 1 tablespoon whey protein powder |
| 1 tablespoon dried Tulsi powder or 2 tablespoons fresh Tulsi leaves | 6 oz. kefir |
| 1-inch (2.5 cm) fresh ginger, peeled | 3-6 oz. water or green tea |

METHOD

1. Chop the apple, celery, greens, ginger, turmeric and sweet basil.
2. In a blender, place a few ice cubes (optional) at the bottom, add all the ingredients and blend until smooth.



Basil Sauce, Dressing and Salad

Italy Meets India Pesto

Basil pesto is a staple of fine Italian cuisine. We have added a seed mixture to enhance its nutritional value.

SERVES 4

INGREDIENTS

1/4 cup hemp seeds
 1/8 cup raw sunflower seeds
 1/8 cup pumpkin seeds
 1/4 cup pine nuts
 2 cups packed fresh sweet basil leaves
 1 tablespoon Tulsi holy basil dried powder
 2 cloves garlic
 1 tablespoon fresh turmeric root, grated
 2/3 cup extra-virgin olive oil
 Sea salt and freshly ground black pepper to taste
 1/2 cup fresh Pecorino Romano cheese, grated

METHOD

1. Pulse the seeds, nuts, fresh sweet basil leaves, dried tulsi powder, garlic, turmeric root, cheese, salt and black pepper in a food processor until combined.
2. With the motor running, slowly add the olive oil through the feed tube at the top.
3. Stop and scrape down sides. Blend until a smooth consistency is reached.
4. Serve with rice crackers, buckwheat bread or toss with some quinoa pasta.

Basil Yogurt Dressing

Using sweet or holy basil with turmeric gives your salad dressing a great taste and potent health benefit.

SERVES 4

INGREDIENTS

1/8 cup rice vinegar
 1 tablespoon maple syrup
 1-2 cloves garlic, minced
 1 tablespoon green herbs (dried or fresh)
 1 tablespoon chia seeds
 1/4-1/2 teaspoon salt
 1 tablespoon dried Tulsi holy basil
 2 teaspoons fresh turmeric, peeled and chopped
 1 tablespoon fresh sweet basil
 1 tablespoon yogurt
 1/2 cup extra-virgin olive oil

METHOD

1. Mix all the ingredients in a blender except the oil. Turn on the machine and slowly add the oil until dressing is emulsified.
2. Store in a glass container until ready to serve.



Basil Sauce, Dressing and Salad (continued)

Captivating Caprese Salad

Fresh, whole milk mozzarella cheese, with tasty spices and sun ripened tomatoes make this a delectable dish.

SERVES 2

INGREDIENTS

2 medium tomatoes, sliced
8 oz. fresh mozzarella balls, sliced
12 fresh or 1 tablespoon dried sweet basil leaves
1 tablespoon extra-virgin olive oil
1 tablespoon balsamic vinegar
¼ teaspoon salt
¼ teaspoon fresh ground pepper

METHOD

1. Arrange the sliced tomatoes and mozzarella on a plate.
2. Gently massage the basil to release flavors and garnish the salad.
3. Drizzle with olive oil and balsamic vinegar.
4. Add salt and fresh ground pepper to taste.

Basil Entrees

St. Paddy's Day Eggs

Fresh basil, alone or with other spices, enhances the flavor and digestibility of a well-made omelet.

SERVES 1

INGREDIENTS

2 tablespoons extra-virgin olive oil, divided
¼ cup onions, minced fine
½ cup spinach, chopped medium
2 tablespoons cilantro, minced fine
2 tablespoons fresh or 2 teaspoons dried sweet basil leaves
2 large eggs
Sea salt and pepper to taste

METHOD

1. Heat half the oil, add the onions and sauté for a few minutes.
2. Fold in spinach and cook just until wilted. Stir in basil and cilantro, turn off heat and set aside.
3. Whisk the eggs with 1 tablespoon water, salt and pepper.
4. In a small sauté pan, heat remaining oil and coat the pan before pouring in the egg mixture.
5. When the eggs start to set, lay the sautéed vegetables and herbs down the middle of the pan.
6. Flip in the sides or fold in half. Cook until completely set and gently slide onto a plate.

Best Broth Ever

Homemade vegetable, spice broth is easy to make and wonderful to use as a basis for soup, sauces and grain dishes.

SERVES 8 CUPS

INGREDIENTS

6 cups of water
2-inches (5 cm) turmeric root
1 tablespoon dried Tulsi
1½ cups dried shitake or oyster mushrooms
½ yellow onion, peeled and sliced in chunks
A handful of pineapple sage
2 tablespoons flax seeds

METHOD

1. Put all the ingredients into a medium saucepan. Heat to a low simmer.
2. After 30 minutes, or longer if you have time, strain out the solids, and use the liquid for the brown rice recipe on page 41.

Herb Vegetable Pilaf

A pilaf is a spiced grain dish. Cooking it in homemade broth and adding savory spices creates a tasty staple dish.

SERVES 6

INGREDIENTS

2 cups basmati brown rice, cooked
 4 cups filtered water or broth (see page 40)
 2 tablespoons extra-virgin olive oil or ghee
 2 bay leaves
 1 tablespoon cumin seeds
 1 cup onion, minced
 2 tablespoons fresh ginger, minced
 2 cloves garlic, minced
 ½ teaspoon ground turmeric
 2 teaspoons ground cumin
 2 teaspoons ground coriander
 ½ teaspoon garam masala (optional)
 1 pinch saffron
 1 cup leafy greens
 ½ cup carrots
 ½ cup green beans
 ½ cup fresh or frozen English green peas
 2 tablespoons cilantro, minced
 8 fresh leaves sweet basil
 ½ teaspoon sea salt

METHOD

1. Soak the rice overnight. Strain the rice and rinse well until the water runs clear. Add rice to a medium saucepan with cold filtered water (or broth). Bring to a boil. Turn the heat to low and cover with a tight fitting lid. Cook without lifting the lid for about 50 minutes. Turn off the heat and set aside.
2. Heat the oil in a large pot or skillet over medium heat. Add the bay leaf and cumin seeds. When spices start to crackle, add onions and sauté for a minute.
3. Add ginger and cook until onions are golden. Add garlic and heat for 30 seconds.
4. Next add turmeric, cumin, coriander and saffron and stir until fragrant.
5. Add the greens, carrots and beans. Lightly sauté for 5-7 minutes.
6. Turn the heat down to low and add peas, cilantro and basil. Cook until peas are vibrant and slightly soft (1-2 minutes).
7. Fold in the pre-cooked brown rice to the mixture.
8. Add sea salt. Taste and adjust seasonings. Serve warm.

Tuscan Bean, Herb and Cabbage Soup

This Italian inspired classic can be made with any seasonal roots and greens.

SERVES 4-6

INGREDIENTS

1 cup dry cannellini or butter beans
 2 tablespoons extra-virgin olive oil
 1 medium onion, sliced
 2 cloves garlic, minced
 1½ cups cabbage, shredded
 1 cup dandelion greens, chopped
 2 medium carrots, thinly slice
 2 medium turnips, thinly sliced
 1½ quarts vegetable stock
 6-8 fresh sweet basil leaves
 2 tablespoons parsley, minced
 Sea salt to taste
 ¼ tablespoon pepper

METHOD

1. Soak the beans for at least 7 hours or overnight. Cook in a pot or a pressure cooker. While it is preferred that you freshly cook the beans, you can use 1½ cans if you are in a hurry.
2. Heat the oil in a large stockpot. Sauté the onions for several minutes until translucent. Add garlic and reduce heat to prevent browning.
3. Add the carrots and turnips next, cover to soften for about 5 minutes.
4. Stir in the cabbage and dandelion greens to coat with oil.
5. Pour in the vegetable stock and bring to a boil. Turn down heat to a low simmer, cover the pan and let it cook for 15 minutes or until all the vegetables are tender.
6. Add the cooked beans, basil and parsley to combine.
7. Add salt and pepper to taste.

SOURCE: Adapted from the "Tuscan Bean and Cabbage Soup" in *Linda's Winter Kitchen*, by Linda McCartney.

Basil Entrees (continued)

Thai Holy Basil Chicken Stir Fry

This dish is a staple of Thai cuisine. The aromatic Thai holy basil cools the warming spices in the dish.

SERVES 1 (RECIPE CAN BE DOUBLED)

INGREDIENTS

1 tablespoon extra-virgin coconut oil	1 clove garlic, minced
1 chicken breast, sliced into small pieces	1 tablespoon fish sauce
1 small bird's eye chili, crushed to expose seeds (optional)	2 teaspoons Thai chili paste
½ onion, thinly sliced	2 teaspoons tamari sauce
	½ red pepper, thinly sliced
	10 Thai holy basil leaves

METHOD

1. Heat oil in a wok over medium-high heat. Add chicken and cook, stirring until golden.
2. Add chili, onion, garlic, fish sauce, chili paste and tamari sauce to the pan. Cook stirring constantly, until onions begin to soften, and liquids thicken slightly, 3-4 minutes.
3. Add red pepper and cook for another 2 minutes.
4. Stir in basil and remove from heat.

SOURCE: Recipe modified from <https://inquiringchef.com/chicken-with-thai-holy-basil/>

Thai Holy Basil Vegetarian Stir Fry

This is a vegetarian rendition of savory Thai Stir Fry using tofu rather than chicken.

SERVES 2

INGREDIENTS

4 oz. extra firm tofu	½ cup onion, minced	½ cup green beans, cut in 1-inch (2.5 cm) pieces
½ cup tamari	3 Thai (or other) chili peppers*, seeded and minced	½ cup broccoli, cut into florets
2 teaspoons ginger, minced	1 cup cabbage, chopped	1 packed cup fresh Thai holy basil
2 cloves garlic, minced	½ cup mushrooms, chopped	
1 tablespoon extra-virgin olive oil		

METHOD

1. Cube the tofu into ½-inch (1.27 cm) squares. Prepare a marinade with tamari with ginger and garlic. Add the tofu, cover and set aside for 10 minutes.
2. Heat the oil in a pan; add the onions and sauté for a minute. Add the Thai chilies with all the vegetables. Stir-fry until they begin to soften and brighten in color.
3. Add the tofu with the marinade and toss to combine. Add basil leaves and stir until wilted.
4. Serve with brown rice.

**Thai chilies are very hot — you might want to avoid the seeds.*



Basil Extract and Tincture

Sweet Basil Extract

There are different ways to extract the phytonutrients from basil, such as extraction by water, vinegar, oil, wine, brandy, vodka or grain alcohol. Below are recipes for water and vinegar extraction:

Water Based

INGREDIENTS

1 tablespoon fresh sweet basil or 1 teaspoon dried
1 cup hot water

METHOD

1. Crush the sweet basil ever so gently using a mortar and pestle.
2. Heat water until it just reaches a boil.
3. Add the hot water to the leaves and cover for 10 minutes or longer.
4. Strain the water and you have your basil-infused water. It will look like green tea.
5. Use right away or refrigerate up to 2 days.

Tulsi Holy Basil Tincture

Tinctures extract beneficial alkaloids and natural flavones from herbs using alcohol. It's concentrated, so use in small doses.

INGREDIENTS

Dried Tulsi holy basil
Vodka or Brandy 80-90 proof (non-GMO)

METHOD

1. Fill a small Mason jar halfway or less with dried Tulsi holy basil.
2. Pour in vodka to cover, leaving just a little room at the top.
3. Label and put the date on the jar.
4. Close the lid, store in a dark area.
5. Shake the bottle every day.
6. After two weeks, place a cheesecloth-covered strainer into a bowl and decant the contents of the jar. Gather the cheesecloth and squeeze the basil until all liquid is in the bowl.

Vinegar Based

INGREDIENTS

1 tablespoon fresh sweet basil or 1 teaspoon dried
1 cup apple cider vinegar

METHOD

1. Crush the sweet basil ever so gently in a pestle and mortar.
2. Put basil in a jar and add vinegar.
3. Flip jar over, or shake well, every day for 14 days.
4. Begin using it in salads.



7. Transfer the liquid into a dark jar, label and date.
8. Pour some of the liquid into a small dropper bottle; label and date the small bottle.
9. Adult dose is 6-10 drops in warm water. It can also be used in teas.
10. Tincture lasts for 2-3 years.

How to Grow Basil

Basil is a highly fragrant and aromatic herb. There are numerous types of basil available. According to the variety, the color of the leaves may vary from green to purple, and the flavor may have a hint of lemon, cinnamon, jasmine, thyme or camphor in it. The seeds should be planted early spring in about a ¼-inch (.63 cm) of rich, moist soil. Plants should be spaced 10-12 inches (25-30 cm) apart. Germination requires 5-7 days, and thinning the plants is not necessary. Growth is rapid, and no special care other than the usual cultivation practices is required. Flowering shoots are pinched out to extend the useful life of plants.

Sweet Basil: A summer herb that can be grown successfully inside during the winter in a sunny window. It is plentiful during the summer months and available year-round in many markets. Choose evenly colored leaves with no sign of wilting. Refrigerate basil, wrapped in barely damp paper towels and then in a plastic bag, for up to 4 days or store a bunch of basil, stems down, in a glass of water with a plastic bag over the leaves. Refrigerate in this manner for up to a week, changing the water every 2 days.

To preserve fresh basil, wash and dry the leaves and place layers of leaves, then coarse salt, in a container that can be tightly sealed. Alternatively, finely chop the cleaned basil and combine it with a small amount of olive oil. Freeze in tiny portions to flavor sauces, salad dressings, etc. Dried basil, though it bears little resemblance in either flavor or aroma to the fresh herb, can be purchased in the spice section of most supermarkets. Store dried basil airtight in a cool, dark place for up to 6 months.

Tulsi Holy Basil: Plant types are Rama Tulsi, Krishna Tulsi and Vana Tulsi. Sow seeds outdoors in late spring or early summer, when the temperature reaches around 70°F (21°C). For an earlier start in spring, sow the seeds indoors in a greenhouse or on a sunny windowsill. Place the Tulsi holy basil seeds on top of the soil and tamp them for good soil to seed contact, cover the seeds with ¼-inch (.63 cm) layer of compost or soil. Water the seeds with a sprayer and place them where they receive partial morning sun. Keep the soil constantly moist until germination, which will take around 1-2 weeks.



When the seedlings have grown 2-3 sets of true leaves carefully transplant them in individual containers or outdoors, taking care not to disturb the roots. As Tulsi holy basil is a tropical plant you can grow it anytime in the tropics. Requirements of growing are similar to sweet basil. It grows well in loamy and fertile soil with good drainage; pH level of 6-7.5 is optimal. It thrives in full sun but grows in partial shade too, at least 4 hours of sunlight a day is required.

How to Grow Basil (continued)

Water the plant when the top 1-inch (2.5 cm) of soil is dry. Do not water during rain. Reduce watering in the winter to prevent diseases. It is important to pinch off the tops of the plant when they are forming four or six pairs of leaves, this will make the plant grow bushier. Even the flower buds need to be removed when they appear. It grows more lush and full when seed production is prevented. It is also important to remove the faded, wilted or discolored leaves to encourage the growth of new foliage. Regular removal of old leaves and flower buds keeps the plant healthy.

Apply liquid fertilizer once every couple of weeks. Replacing the top 2-inch (5 cm) layer of soil with compost every 6 months to a year is also beneficial. Prune as needed throughout the year to control its size and promote bushier and more compact growth. Never remove more than half of the growth of stem while pruning.

Move plants indoors in the winter if you live below USDA Zone 10. Place the plant near a bright sunny window, where the temperature is kept above 50°F (10°C). Move the plant again outside after the danger of frost has passed.

To harvest, reap the aromatic leaves of your plant throughout the growing season. Once your plant reaches 12 inches (30 cm) in height, take a pair of scissors and depending on your needs, cut a large single leaf or a whole branch. Cutting just above a leaf will ensure continued growth on that branch. Use fresh leaves on the same day you harvest because they fade quickly. Store your Tulsi harvest for future use by drying out the leaves. Collect branches in a basket and place them in a dry spot away from sunlight and toss them 2-3 times every day until leaves become crispy.

How to Make Basil Powder

To dry basil, strip the leaves from the stem and dry in a dark, airy location. Run them through a grinder mill to get powdered leaves. Store dried leaves whole in an airtight container.



Glossary

To assist you in learning about and cooking with spices and ingredients that may be unfamiliar to you, we are including this list of terms with brief definitions to broaden your knowledge and use of these nourishing and flavorful ingredients.

A2 milk is a variety of cows' milk that contains a β -casein protein known as type A2. Historically the U.S. Jersey cows were producing more A2 than A1 protein, however a mutation occurred and the cows started producing more A1 protein. The A1 protein form of casein can be more difficult to digest. A2 milk protein producers showed clinical trials to support their claim that A2 is easier to digest than A1 milk.

Ajwain is referred to as a seed, but is actually the fruit of the ajwain herb. It is also known as ajwain caraway, bishop's weed or carom. The herb is commonly used in Indian cuisine where the "seeds" and the leaves are used. The seeds are greenish brown in color and look similar to cumin or caraway, but the flavor is closer to thyme. They are rich in fiber, minerals, vitamins and antioxidants and have been shown to have anti-bacterial, anti-fungal and anti-inflammatory properties. Available in specialty markets and online.

Arame, or sea oak, is a species of kelp indigenous to the Pacific ocean and popular in Japanese cuisine. It has a mild, delicate flavor and texture. It is commonly sold dried and is reconstituted by soaking in warm water. Arame is rich in iodine, calcium and potassium. It is available in health food stores and markets, or online.

Arborio rice is a starchy short-grain rice originally from the town of Arborio in northern Italy. It is primarily used to make risotto because it releases its starches during cooking providing a creamy texture. It is available in most markets or online.

Asafetida comes from the gum resin of a perennial fennel plant called *ferula asafoetida*. The resin is ground into a powder and most often used in

Indian and Iranian cooking. Its pungent scent is tamed when cooked, and its taste is described as a pleasant onion or leek flavor. Studies suggest it may be useful for digestion and in treating pain, respiratory and reproductive issues and mood disorders. Available in specialty markets and online.

Biryani is a Persian-inspired rice dish from the Mughal dynasty in India. Mughal cooking, called "dum" is a slow cooking method. Biryani is typically rice combined with meats, nuts, dried fruits and potatoes. The meat or a vegetable protein is marinated with spices such as ginger, cloves, pepper and cinnamon and combined with rice. It is cooked very slowly to release a complex, pleasant aroma and exquisite flavor.

Bomba rice is a short-grain variety of rice, primarily cultivated in eastern Spain. It is commonly used in paella because it can absorb three times its volume in liquid without becoming sticky. It is also called Valencia rice. Available in specialty markets and online.

Bouillabaisse is a hearty stew first made by fishermen in the French port city of Marseilles from the fish scraps that couldn't be sold to restaurants or markets. It typically features fish and seafood with tomatoes and potatoes in a spice mix that includes garlic and saffron imparting a beautiful aroma, flavor and color.

Channa is the Indian name for chickpeas. Different types are known as gram or Bengal gram, garbanzo or garbanzo bean, Egyptian pea, chana, and chole. Chickpea seeds are high in protein, vitamins, minerals and fiber. Chickpeas prepared with a blend of Indian spices is a staple of traditional vegetarian Indian cuisine.

Chia seeds are tiny oval seeds from the plant *Salvia hispanica* which is part of the mint family. They come in black or white and are rich in protein, fatty acids, minerals, antioxidants and soluble fiber. Black seeds tend to have a higher protein content and white seeds are higher in Omega 3 fatty acids.

Consommé is a clear soup made from a stock that has been reduced and clarified. Egg whites are then added to remove fat and sediment. It is a time-consuming process that yields a clean and deeply flavored soup.

Curry leaves are small shiny leaves grown on the curry leaf tree, native to India. They are not related to curry powder which is a blend of other spices, herbs and seeds. They impart a pungent citrus flavor and aroma to food. They are high in antioxidants, fiber, calcium vitamins and minerals. You can find them fresh or dried at specialty markets and online.

Dried barberries are deep red and tart berries grown on a shrub or bush in Europe, North Africa, the Middle East and Central Asia. Organic barberries have been used medicinally for centuries to treat digestive issues, skin conditions and infections. The fruit, stem and root bark contain *berberine* which is anti-bacterial and anti-inflammatory. Available in specialty markets and online.

Dried black limes are small limes that have been blanched in salt brine and then dried in the sun or dehydrated. They are used whole or ground in dishes from Iran, Iraq and Northern India. Dried limes are used to add flavor to soups, stews and rice dishes. They are sour, with a citrus and smoky flavor. In their powdered form they can be rubbed on meats, sprinkled on grains or added to beverages or tea. Available at specialty stores and online.

Edamame are young, green soybeans usually sold in their pods fresh or frozen. They are different from mature soy beans which are tan or beige, similar to tofu or tempeh. Edamame pods are boiled or steamed and may be served with salt or other condiments. This low calorie snack is high in protein and rich in vitamins and minerals.

Fenugreek is a fragrant herb, native to southeastern Europe and western Asia, but now cultivated

worldwide. Its seeds and leaves are used in Indian cuisine imparting a slightly sweet and nutty flavor. The seeds are brown in color and taste bitter. Dry roasting them brings out a sweet, slightly maple flavor. Methi is the Hindi word for the fresh fenugreek leaves. It is great for the digestive track. Dried methi can be substituted for fresh. Available fresh and dried from specialty stores and online.

Garam masala is a dry roasted powdered blend of spices that play an integral role in Indian cuisine. It originated in Northern India, with its colder climate to provide warmth to the cuisine of that region. There is no one masala recipe, but a typical garam masala includes cumin, coriander, cloves, cinnamon, nutmeg, cardamom and black pepper. Blends vary by region and recipes are passed down through families.

Ghee is a clear form of butter with the milk solids and water removed. It is different from traditional clarified butter because the milk solids are cooked longer and allowed to brown giving it a nuttier flavor. It can be made by slowly simmering unsalted butter in a pan, straining off surface milk solids. It is ready when the butter turns light gold and remaining solids turn brown and sink to the bottom of the pan. The mixture can then be strained through a cheesecloth and the liquid ghee saved in a sealed glass jar. Ghee is widely sold in natural food stores and available online.

Gluten-free flour is wheat-free flour. Varieties include almond, buckwheat, teff, sorghum, amaranth, rice, oat, millet, tapioca, garbanzo and arrowroot flours. They all behave differently and cannot be used interchangeably. Gluten-free flour blends, such as *Bob's Red Mill*, are the best substitute for wheat flour. Nut and seed flours can be made by grinding nuts or seeds at home or purchased as a ground meal. Both flours and meals are best refrigerated to prevent oxidation by heat and light.

Golden milk is a beverage traditionally made with cow's milk, turmeric, ginger and black pepper. Nut or coconut milk can be used instead. Its anti-inflammatory, antioxidant and digestive properties are reported to improve sleep.

- Gremolata** adds a burst of flavor to meat, fish and pasta dishes when added as a condiment or garnish and is commonly used in Mediterranean cuisine. It usually consists of freshly chopped parsley, lemon zest and garlic, although mint, basil or cilantro can be substituted for the parsley as well.
- Jaggery** is an unprocessed unrefined sugar made from cane juice and sometimes date palm sap. It has a caramel brown-sugar like flavor. Its color can vary from golden to dark brown in color. 70% of all jaggery comes from India where a lighter colored jaggery is preferred. Jaggery is slightly healthier than refined sugar because of its molasses content, but should still be used in moderation.
- Kashaya** is a term that comes from Ayurveda and refers to a drink to support cold, sore throat and flu symptoms. The drink can often include tulsi holy basil, black peppercorns, coriander, cumin, ginger, ajwain seeds and honey.
- Kasuri methi** is the name used in India for dried fenugreek leaves. The taste is compared to celery and fennel with a slightly bitter bite. Methi is a very popular herb in Indian, Persian and North African cuisines. Available in specialty stores and online.
- Kombu** is a sea kelp popular in Japanese cuisine. It can be used in soups, stocks and to flavor rice and bean dishes. It adds a rich “umami” and slightly salty flavor when infused into foods. Kombu is sold dried in large slices, pickled in vinegar or dried and shredded. It is one of three main ingredients in Dashi (Japanese fish stock). Kombu is a great source of iodine, vitamins, minerals, Omega 3s and amino acids.
- Mace**, the spice, should not be confused with the popular pepper spray with the same name. The spice comes from the red lacy coating (or aril) covering the nutmeg seed. It is removed from the seed and broken into pieces called blades. Mace has a strong aromatic flavor described as a cross between nutmeg, cardamom and cinnamon with a hint of citrus and pepper.
- Masala** is the generic name for a blend of spices used in Indian cuisine. It can be made from any number of spices either dried or ground into a paste. Some common North Indian blends include cumin, coriander, cayenne, black peppercorns, clove and cardamom.
- Masala chai** is black tea with spices such as ginger, cinnamon, cloves and milk. The typical preparation method is to simmer all the ingredients in water and milk and sweeten at the end.
- Methi roti** is a pan grilled flatbread made with fresh fenugreek (methi) leaves and flour.
- Moong dal** refers to split mung beans. When opened they appear as tiny yellow or green split peas. They cook faster and do not need to be soaked in advance. They are packed with protein and fiber and are low in fat, thus are considered beneficial for weight loss.
- Njavara rice** is a red rice grown in India used in Ayurvedic medicine. It is reported to support the immune system, and aid in the management of diabetes, rheumatoid arthritis and osteoporosis. Available in specialty markets and online.
- Paella** is a popular dish in Spanish cuisine, originally from Valencia. It is made with bomba rice and usually includes saffron, chicken, seafood, chorizo sausage and peas cooked and served in a large shallow “paella” pan.
- Palak** is the Indian name for spinach. A popular vegetarian dish called palak paneer consists of cubed paneer cheese in a thick sauce made from puréed spinach and seasoned with ginger, garlic, garam masala, and other spices.
- Paneer** is a homemade fresh cheese made by curdling milk with an acid like lemon juice or vinegar. One can make the paneer at home from whole milk. It is also available in Indian grocery stores and many natural food markets.
- Poblano pepper** is a mild flavored chili pepper from Puebla, Mexico. Deep green when fresh, the peppers turn dark red and become hotter as they ripen. Stuffed fresh and roasted they are popular in Latin American dishes such as “Chiles Rellenos Poblano.” If allowed to dry in the sun the peppers turn reddish brown and are called ancho chilis or chile ancho. Dried and ground into a spice, they impart a sweet, hot and smoky flavor to dishes like “Mole Poblano.”

Rajma is a popular vegetarian curry made with red kidney beans in a thick tomato-based sauce with a blend of whole Indian spices. It is usually served with rice.

Rapid rise yeast or quick rise yeast is dry yeast that doesn't need to be "proofed" or hydrated before adding to flour. It only requires one rise of the dough before baking. It may include ascorbic acid which is used as a dough conditioner.

Red gram/dal, also known as red gram or tur are small, round or oval legumes. In English, they are commonly known as pigeon peas and they are widely consumed in Asia, Africa, and Latin America. They are a great source of fiber and potassium.

Tamarind is a tropical fruit native to Africa, but it also grows in India, Pakistan, Southeast Asia and the West Indies. The fruit grows in bean-like pods filled with seeds surrounded by a fibrous pulp. Once ripe, the pulp can be extracted and made into a tart paste. Tamarind is popular in Indian chutneys and curries, to tenderize meats, as a sauce in Thai cuisine, in beverages and desserts in Latin America. Available in specialty markets and online.

Tandoori masala is a mixture of spices blended for use when cooking with a tandoor, or clay oven, in traditional Indian cooking. The typical spices

include garam masala, garlic, ginger, onion, and cayenne pepper. The spices are traditionally ground together with a mortar and pestle. Tandoori masala is combined with yogurt to make Tandoori chicken and roasted in a clay pot at high heat. When prepared in this fashion, the chicken has a pink-colored exterior and a savory flavor.

Thai chili paste is a spicy chili sauce typical of Thai cuisine. Ingredients typically include fresh or dry chilies, garlic, shallots, lime juice, fish or shrimp paste. Traditionally, the ingredients are pounded together using a mortar and pestle, with either salt or fish sauce added to taste. Blended Thai chili paste can be purchased at a Thai or natural food market or online.

Urad dal is a lentil that is also called black gram. Urad dal is a high protein black lentil which comes in three categories: whole urad, split urad with skin and split urad without the skin. Available in specialty markets and online.

Wakame is a super nutritious seaweed harvested in thin green strands and often used in seaweed salad and miso soup. A hallmark of Japanese cuisine, it has a subtle, sweet flavor and sturdy texture. It can be used dried or fresh and like other sea vegetables is high in iodine, Omega 3s and minerals.

Shopping Guide for Spices and Special Ingredients

When looking to purchase spices, aim to buy whole leaf, root or seeds that you can grind yourself in your own kitchen. These will be the freshest and most flavorful. If you purchase bulk spices from a natural grocery from open containers, smell the spice to see if it has a pungent aroma. Spices that you purchase online, whether whole spices, powders, or tinctures, are sold in sealed containers. Start by buying one or two ounces of an unknown product to see if you like it. If it is excellent quality as you determine from the smell, taste and effect, you can purchase more for your pantry.

Many of the spices in our book come from India. Look for an Indian market locally and get to know the owner or buyer. Ask him or her if their bulk or packages are fresh. When did they arrive? How long have they been on the shelves? Below is a list of online shopping sites for spices, herbs and special ingredients that you may not be able to find in your natural, ethnic, or gourmet food market.

Indian and International Spices

- <https://www.thespicehouse.com/collections/india?>
- <https://www.myspicesage.com/spices-seasonings>
- <https://indiangrocery.com/Cooking-Essentials/Spice-Mixes>
- <https://www.myspicer.com>
- <https://www.savoryspiceshop.com>
- <https://www.penzeys.com>
- <https://www.spicejungle.com>
- <https://www.thrive.com>
- <https://www.amazon.com>

Ayurvedic Spices and Products

- <https://ayurvedamegastore.com>
- <https://indianonlinespices.com>
- <https://wholesale.khanapakana.com>
- <https://www.ayurvedicherbsdirect.com>
- <https://www.banyanbotanicals.com/shop/category/bulk-herbs-spices-formulas>
- <https://www.pureindianfoods.com/spice-blends-s/62.htm>

Herb and Spice Tinctures and Supplements

- <https://www.gaiaherbs.com>
- <https://www.innateresponse.com>
- <https://www.douglaslabs.com>
- <https://www.prairieherbfarms.com>
- <https://www.mountainroseherbs.com>
- <https://www.starwestbotanicals.com>
- <https://www.dragonherbarium.com>
- <https://www.herbco.com>
- <https://www.livingearthherbs.com>
- <https://www.amazon.com>

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- http://en.wikipedia.org/wiki/Ocimum_tenuiflorum;
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About the Authors



Dr. Ed Bauman has been at the forefront of the holistic health renaissance for the past 50 years. He has earned a Masters in Education from the University of Massachusetts, and a Ph.D. in Health Education from the University of New Mexico. He is the founder and president of **Bauman College: Holistic Nutrition and Culinary Arts**. After studying traditional health systems for more than 30 years, Dr. Bauman created the *Eating for Health*™ approach, which forms the basis of his programs and wellness retreats. At **Bauman Wellness**, Dr. Bauman consults with individuals, companies and teams on how to overcome chronic illness and achieve optimal well being. Dr. Bauman is a co-founder of the *National Association of Nutrition Professionals*.

In the 1970's Dr. Bauman lived on an organic farm in Western Massachusetts where he grew food and preserved food, cooked on a wood stove, started a natural food coop and the *Home Comfort Restaurant*, an all organic farm to table restaurant. Thereafter, Dr. Bauman moved to California where he co-founded and directed the *Berkeley Holistic Health Center*, a landmark integrative health clinic. For over 30 years, Dr. Bauman has facilitated *Vitality Rejuvenation Retreats* for groups in pristine natural settings. On retreat, folks practiced juice fasting, colon cleansing, yoga, meditation, sharing and living consciously in community.

More recently, Dr. Bauman developed the highly acclaimed *Affordable Nutrition Program* taught by his graduates to people in transition, recovering from illness, addiction, poverty, abuse and low food making skills. *Affordable Nutrition* teaches people how to source, prepare and share local food, and eat well on a modest budget. Dr. Bauman is the co-author of the best-selling *Holistic Health Handbook*, *Holistic Health Lifebook*, *Whole Food Guide for Breast Cancer Survivors*, *Foundations of Nutrition Textbook*, *Therapeutic Nutrition Textbook*, *Flavors of Health Cookbook*, *Affordable Nutrition Workbook*, and *Spice for Life: Self-Healing Research, Remedies and Recipes*.



Shiela Moorthy received her Master's in Business Administration with a major in Marketing from the University of Mumbai, India and a Master's in Economics from Bhopal University, India. She has worked in the Philadelphia area for 25 plus years, starting in market research and transitioning to marketing.

Moorthy is now dedicated to helping people regain and maintain health and vitality through whole foods nutrition, custom supplementation and wellness coaching. She received her Nutrition Consultant certificate through California state-certified Bauman College: Holistic Nutrition and Culinary Arts, graduating with honors. Subsequently, she founded **Vitalify Nutrition, Inc.** (www.vitalifynutrition.com) to educate and empower individuals to take control of their health and wellness.

Shiela offers comprehensive support, one-on-one consultations that include custom diet analysis and recommendations, and group wellness programs. She has been practicing yoga much of her life and recently became a certified yoga instructor. She teaches vinyasa flow, pranayama, and meditation around the Philadelphia area.

About the Photographer



I am a professional photographer specializing in food and travel photography. Photographing fresh foods artistically styled into tantalizing visuals is my art form and a challenge I love.

I have worked as an editorial photographer capturing high-quality compelling imagery of food, cooking, and people used in cookbooks, magazines and websites in the San Francisco Bay Area for 26 years.

My photos have been featured in books including the *Flavors of Health Cookbook*, *Affordable Nutrition*, *Two Hearts*, *Four Hands*, *Eating for Health* and the award-winning *New Mexico's Living Landscapes: A Roadside View*.

Taking photos for *Spice for Life* has been my favorite project to date. The process of tuning my camera's settings to the play of light on these beautiful dishes has been very gratifying. It was also satisfying to sample the dishes made for photo sessions! Below are some photos from our trip in India.

— Christine Bauman

