

Turmeric

BY JACQUELINE STRAX

Turmeric, also called curcumin, has been used in

Asian cookery for thousands of years. Powder ground from the dried root is an ingredient in curry. Turmeric is one of the cheaper spices and makes a vivid splash of color, so it gets heaped into low-market curry blends as fill. Not such a bad idea.

Turmeric holds a high place in Ayurvedic medicine as a "cleanser of the body" and today science is finding a growing list of diseased conditions which turmeric's active ingredient heals.



Credits: photo of Turmeric root from [SEAsite](#) (South East Asia Resources U Northern IL.) is from their

[Ingredients](#)

[Reference: Recipes, Indonesia page.](#)

capsules are sold through a number of suppliers. But why make this spice part of the diet? Let's not romanticize South Asian nutrition today. Although India is doing relatively well, 47% of children there are underweight ([Nutrition for Health Development, chart](#)). South Asia's nutritional crises and disparities are

Ground from the root of a plant (*Curcuma longa* L.) of the ginger family, found wild in the Himalayas and grown across South Asia, turmeric powder is surprisingly bland, **no** hot, tangy or peppery. The powder tastes a little sour. The first time I put some on my tongue I suspected my jar, purchased from a supermarket, was stale. Turmeric is pungent, bitter and astringent, not sweet like ginger. Fresh root, which goes well in snacks and main meals, as yet may be hard to find outside of stores in Asian neighborhoods. Turmeric

Caution!

Curcumin May Weaken or Undo Effects of Chemotherapy for Cancer. [Cancer Research 62, 3868-3875, July 1, 2002, Dietary Curcumin Inhibits](#)

[Chemotherapy-induced Apoptosis in Models of Human Breast](#)

[Cancer](#) Sivagurunathan Somasundaram et al, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Turmeric in the wild: photo, Himalayas

Ganesh Mani Pradhan & Son, West Bengal, India [Therapeutic potential of curcumin in human prostate cancer.](#)

[III.](#) Dorai T... Katz AE. Prostate 2001 Jun 1;47(4):293-303

"Curcumin could be a potentially therapeutic anti-cancer agent, as it significantly inhibits prostate cancer growth... and has the potential to prevent the progression of this cancer to its hormone refractory state."

harsh. Centuries of charcoal fires for home and industry have contributed to deforestation. Clean water, a cure for malaria, vaccinations and reproductive health care, not more spices, are what most of the citizens of those lands need to improve *their* health. Yet the very survival of peoples in South Asia must at times have depended on informed use of a wide array of stored dried plants including turmeric root.

A Little Dab

Most North Americans consume only miniscule traces of turmeric, say, by way of mustard lavished on meats of iffy provenance. Bright yellow mustards like French's "classic American" contain, labels say, "no more than 2 per cent" turmeric, paprika and other spices (as if more would adulterate the product). Mustard itself is medicinal. But that gaudy, store-bought, hot-dog-stand glow comes from curcumin, the intense yellow pigment in turmeric. And curcumin protects the stomach against tainted foods. According to University of Chicago scientists, curcumin inhibits a cancer-provoking bacteria (*H. pylori*) associated with gastric and colon cancer (Magad GB, **Anticancer Res. 2002 Nov-Dec;22(6C):4179-81**).

On the margins, so some biologists say, eco-diversity sprouts. Today curcumin is on a margin between ancient food customs and cutting-edge medicine. In suburban cuisine it can brighten and glorify nutritious foods (cauliflower, white fish). At ballpark, beach and food mall a dab of "hidden" curcumin helps carnivore bellies lower risks from gorging on over-handled broiled oddments. In Asia the root and powder are used in cooking, home remedies and medicine: to gild and help preserve festive dishes and in drinks, ointments and poultices to treat sore throat, sprains, inflammation and wounds. In the lab, scientists are dosing rats with curcumin to measure its effects on cancer.

Prostate Cancer Patients Go For the Gold

Turmeric lore in recent decades drifted outwards from Asian diaspora communities in European cities like Leicester, UK. Local researchers and cancer patients listened up. Clusters of men on Internet **prostate cancer**

Study views turmeric and other "**bioactive**" **vegetable foods** as hope for cancer prevention. (1998)
Curcumin and genistein ... show synergistic inhibitory effects on the growth of human breast cancer MCF-7 cells induced by estrogenic pesticides. Verma SP, et al. Tufts University School of Medicine, Boston

Curcumin is an in vivo inhibitor of angiogenesis. A team at Harvard Medical School, 1998.
Some perspectives on dietary inhibition of carcinogenesis: studies with curcumin and tea. A team at Rutgers, 1997.

support groups (notably Don Cooley's lists) began seriously experimenting with turmeric to cope with a troublesome side-effect of androgen-suppression therapy, gynecomastia (sore swollen breasts). Most men who take antiandrogen drugs like Flutamide (Eulexin) or Casodex experience this breast swelling, which can be painful. Gynecomastia can occur also with use of **finasteride**(Proscar), prescribed for BPH (benign growth of the prostate) and now under discussion as a chemopreventive for prostate cancer. Before starting Casodex some patients opt to receive a brief course of radiation to the breasts. Others have tried **low-dose tamoxifen**, which raises levels of circulating estradiol. Then there are the turmeric warriors, who report that dietary intake of turmeric (in salads, soups and sandwiches made with fresh root) and use of curcumin paste externally brings some relief.

Still more intriguingly, University of Leicester began investigating dietary agents including curcumin, genistein, and the vitamin A analogue 13-cis retinoic acid for tumor-suppressing properties (**Br J Clin Pharmacol 1998 Jan;45(1):1-12**;update **Toxicol Lett 2000 Mar 15;112-113:499-505**). They observed that curcumin slows the rate at which hormone-responsive prostate cancer cells become resistant to hormonal therapy. Antioxidant, anti-inflammatory and anti-carcinogenic properties of turmeric and curcumin are undergoing intense research. Tests **in Germany, reported July 2003**,found that "All fractions of the turmeric extract preparation exhibited pronounced antioxidant activity...." Turmeric extract tested more potent than garlic, devil's claw, and salmon oil [J Pharm Pharmacol. 2003 Jul;55(7):981-6]. Does this mean, the more the better? Not necessarily. Some studies find no ill effects from large doses but others (listed in references below) disagree. Of note, a recent study of curcumin to prevent cataracts found, unexpectedly, that in rats low doses did lower cataract rates but heavy doses raised the rate of cataracts (**Molecular Vision 2003; 9:223-230**, full text free online). Another study found that rats fed large amounts of turmeric for 14 days developed enlarged, damaged livers.

Several studies indicate that curcumin slows the

Lentils With Turmeric (Tarkha Dal)

1/2 cup split red lentils
1/4 cup split yellow lentils

2 1/2 cups water

1" piece ginger, minced

2 green chillies, finely chopped

2 large cloves garlic, minced

1 or more teaspoons turmeric

1 onion, chopped

1 tomato, chopped

4 teaspoon mustard seeds

4 dried red chillies

1 Tblspn. olive oil

salt to taste

Few cilantro leaves (or other herbs, like basil) to taste, chopped.

Method: Boil the lentils in water salt and turmeric for 15-20 minutes or until soft.

Mash the lentils till creamy. If the lentil mixture looks too dry,

add some water. Heat the oil in a pan. Add the mustard seeds and red chillies. Add the onion, ginger, garlic and green chillies fry for 2 minutes. Add the tomatoes and cook for another 2 minutes. Add the lentils and mix

development and growth of a number of types of cancer cells. In Japan this year researchers defined curcumin as a broad-spectrum anti-cancer agent. Its induction of "detoxifying enzymes," the researchers say, indicate its "potential value ... as a protective agent against chemical carcinogenesis and other forms of electrophilic toxicity. The significance of these results can be implicated in relation to cancer chemopreventive effects of curcumin against the induction of tumours in various target organs" (Iqbal M, et al. **Pharmacol Toxicol.** 2003

Jan;92(1):33-8).

Since India won a claim against two US scientists who shamelessly patented turmeric (see sidebar), the tide of interest may naturally be driven in part by Asian pride in phytomedicinal heritage. But as scientists at M. D. Anderson, Texas, wrote in January 2003: "Extensive research over the last 50 years has indicated [curcumin] can both prevent and treat cancer. The anticancer potential of curcumin stems from its ability to suppress proliferation of a wide variety of tumor cells, down-regulate transcription factors NF-kappa B, AP-1 and Egr-1; down-regulate the expression of COX2, LOX, NOS, MMP-9, uPA, TNF, chemokines, cell surface adhesion molecules and cyclin D1; down-regulate growth factor receptors (such as EGFR and HER2); and inhibit the activity of c-Jun N-terminal kinase, protein tyrosine kinases and protein serine/threonine kinases." In their latest of a series of reports the M. D. Anderson say: "Curcumin can suppress tumor initiation, promotion and metastasis.

Pharmacologically, curcumin has been found to be safe. Human clinical trials indicated no dose-limiting toxicity when administered at doses up to 10 g/day. All of these studies suggest that curcumin has enormous potential in the prevention and therapy of cancer." [Aggarwal, BB et al, **Anticancer Res.** 2003 Jan-Feb;23(1A):363-98].

Several breast tumor cell lines, "including hormone-dependent and -independent and multidrug-resistant (MDR) lines," respond to antiproliferative effects of curcumin. Aggarwal et al examined cell lines "including the MDR-positive ones," and found they were all "highly sensitive to curcumin. The growth inhibitory effect of curcumin was time- and dose-dependent.... Overall our results suggest that curcumin is a potent antiproliferative

thoroughly. season if necessary. Cook for a while. Garnish with cilantro. Serve hot. (recipe adapted from Dals recipe at A Taste of India in Bitu's Vegetarian Cafe (no longer online).

Turmeric information: nutritionfocus.com **Spice 'N Flavor**(About Spices)

Soothe Yourself with a Thai Herbal Steam Bath

Inhaled steam vapor - made from a mixture of fresh and dried essential herbs boiled in water was used to treat skin ailments, muscle stress, and respiratory problems. The roots and rhizomes traditionally used include turmeric, prai (closely related to ginger), lemongrass, bergamot lime, leaves of the camphor tree and the tamarind tree, among others.

Turmeric image large from Drug plant engravings in **Materia Medica and Pharmacognosy** by David Culbreth, M.D.

agent for breast tumor cells and may have potential as an anticancer agent." (**Anticancer Drugs. 1997 Jun;8(5):470-81**). Other laboratories offer varying explanations but confirm the activity level of curcumin against breast, prostate and other cancers. See e.g., **Ramachandran C, Miami 1999; Hidaka H, Japan, 2002**(human pancreatic cells lines); Elattar TM, University of Missouri-Kansas City, 2000(oral cancer cell-line). Some researchers say curcumin **inhibits angiogenesis**, i.e. formation of new blood vessels, which tumors use to nourish themselves as they spread (**Mol Med 1998 Jun;4(6):376-83**). As an anti-inflammatory, turmeric triggers heat-shock stress response (see **Wiki Online Encyclopedia for heat-shock**). Heat shock proteins stimulate the immune system. "The mechanism of the stimulation by curcumin of the stress responses," Japanese researchers say (**Cell Stress Chaperones 1998 Sep;3(3):152-60**), "might be similar to that of **salicylate** [active in aspirin and similar drugs derived from willow bark], **indomethacin** [a nonsteroidal antiinflammatory drug] and nordihydroguaiaretic acid [an anti-oxidant, antiinflammatory, **lipoxegenase inhibitor** found in **chapparel**, that interferes with arachidonic acid metabolism].

To sum up -- regular healthy folks may benefit from adding turmeric to the spice rack and using it more liberally on adult and childrens' foods. Kids love bright colors. And turmeric is an ideal brightener for rice and for steamed or gently fried tofu.

For cancer patients, until curcumin has been shown in well-designed, well-conducted human clinical trials to have measurable effects on existing disease, it remains just another interesting home remedy with a lot of promise. Research at **Memorial Sloan-Kettering** a few years back indicates that it makes sense to drink green tea along with a meal spiced with turmeric for double-boosted anti-cancer protective effects: "EGCG and curcumin, were noted to inhibit growth by different mechanisms, a factor which may account for their demonstrable interactive synergistic effect." For new developments with curcumin, M. D. Anderson is another

place to watch. 

(1927) at **Southwest School of Botanical Medicine**

Patenting, piracy and perverted promises

"In 1995, two US scientists from the University of Mississippi were granted a US patent (No. 5,401,504) on the use of turmeric for healing wounds, claiming this to be novel. In their application, they acknowledged that 'turmeric has long been used in India as a traditional medicine for treatment of various sprains and inflammatory conditions.' However, they claimed that there was no research on the use of turmeric as a healing agent for external wounds. The Indian government challenged the patent, which it considered a form of blatant thievery, and provided many research papers predating the patent application proving that turmeric has been used in India specifically to heal wounds. Finally, the US Patent and Trademark office gave the reason to India, by rejecting all 6 patent claims." From **Genetic Resources**

If you are taking medications or undergoing radiotherapy or chemotherapy to treat cancer, be extremely cautious about possible interactions and effects of turmeric/curcumin on your liver and other organs. Talk to your oncologist and oncology nurse.

A recent study, available free online, finds that curcumin inhibits desired effects of chemotherapy for breast cancer:

Cancer Research 62, 3868-3875, July 1, 2002, Dietary Curcumin Inhibits Chemotherapy-induced Apoptosis in Models of Human Breast Cancer

Sivagurunathan Somasundaram et al, The Lineberger Comprehensive Cancer Center and the Department of Medicine [R. Z. O.], Division of Hematology/Oncology, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Notes

1. On tumor cells in a lab dish, curcumin prevents or slows prostate and lung cancer. But dietary consumption of turmeric, researchers report, so far shows no effect on those organs and failed to inhibit tobacco-induced tumors (**Cancer Lett 1999 Apr 1;137(2):123-30**).
2. Recent studies found that curcumin has a dose-dependent chemopreventive effect in rats during promotion/progression stages of colon cancer (**Cancer Res 1999 Feb 1;59(3):597-601**). It has similar preventive effects against skin cancer, oral cancer and forestomach and other intestinal tumors (**J Surg Res 2000 Apr;89(2):169-75**).
3. Tufts researchers say "a mixture of curcumin and isoflavonoids is the most potent inhibitor against the growth of human breast

Action

International Barcelona, Spain

tumor cells. These data suggest that combinations of natural plant compounds may have preventive and therapeutic applications against the growth of breast tumors induced by environmental estrogens" (**Environ Health Perspect 1998 Dec;106(12):807-12**)

4. Curr Pharm Des. 2002;8(19):1695-706. Chemotherapeutic potential of curcumin for colorectal cancer. Chauhan DP. Division of Gastroenterology, Department of Medicine, The University of California, San Diego, CA 92093-0688, USA.
5. Turmeric compares with soy, licorice, red clover, and thyme in binding to progesterone and estrogen receptors in breast cancer cells (**Proc Soc Exp Biol Med 1998 Mar;217(3):369-78**).
6. Kentucky researchers report curcumin "inhibited proliferation of a variety of B lymphoma cells" (**Clin Immunol 1999 Nov;93(2):152-61**).
7. Curcumin may or may not protect against cellular damage from radiation, perhaps **depending on dose**. It appears to protect against damage to certain organs brought about by some chemotherapy agents. In hamsters it protects the kidneys from Adriamycin (**Br J Pharmacol 2000 Jan;129(2):231-4**). **If you are taking radiation or chemotherapy, it is very important to discuss your diet and use of any antioxidants with your oncologist.**
8. Typical dietary amounts of turmeric have an antioxidant

effect that protects rats from cataracts. But in one study rats heavily dosed developed more cataract signs (**Molecular Vision 2003. 9:223-230**).

9. Curcumin protects rats from liver-damage caused by toxins (**J Pharm Pharmacol 2000 Apr;52(4):437-40; Carcinogenesis 2000 Feb;21(2):331-5**) But in one experiment, mice fed anti-cancer doses of curcumin for 14 days developed enlarged, damaged livers.
10. **Dosing mice with curcumin for 14 days damaged their livers.**
11. Curcumin prevents formation of some tumors: J Cell Biochem Suppl 1997;27:26-34 **Inhibitory effects of curcumin on tumorigenesis in mice. Huang MT, Newmark HL, Frenkel K Department of Chemical Biology, College of Pharmacy, Rutgers-State University of New Jersey, Piscataway, NJ 08854-8020, USA.**
12. Arousal of the human system through "heat shock" response: **Curcumin induces the stress response.**
13. Drink green tea with a meal spiced with turmeric for double-boosted anti-cancer protective effects: "EGCG and curcumin, were noted to inhibit growth by different mechanisms, a factor which may account for their demonstrable interactive synergistic effect." **Memorial Sloan- Kettering researchers, 1998**
14. Curcumin and genistein protect breast cells against DDT and other pesticides **Tufts School of Medicine,**

- 1997**
15. More reading:
**Lipoxygenase Inhibitors
as Potential Anti-Cancer
Drugs** Ted Holman,
Chemistry & Biochemistry

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