Komoditas : TEH

Record 1
AU: Chang,-C.M.J.; Wu,-S.M.; Yang,-P.W.
TI: High-pressure carbon dioxide and co-solvent extractions of crude oils from plant materials.
SO: Innov-food-sci-emerg-technol. New York, NY : Elsevier Science, c2000-. Sept 2000. v. 1 (3) p. 187-191.

Record 2
AU: Akiyama,-Y.; Yoshioka,-N.; Tsuji,-M.
TI: Pesticide residues in agricultural products monitored in Hyogo Prefecture, Japan, FYs 1995-1999.
SO: J-AOAC-Int. Gaithersburg, MD : AOAC International. May/June 2002. v. 85 (3) p. 692-703.
AB: During a 5-year monitoring survey (April 1995-March 2000) of pesticide residues in agricultural products, 765 samples (478 domestic; 287 imported) collected in Hyogo Prefecture, Japan, were analyzed. The number of pesticides tested increased from 107 in fiscal year (FY) 1995 to 204 in FY 1999. The purpose of the study was to promote consumer safety by excluding the food illegally containing pesticide residues from markets. Overall, 51% of domestic and 32% of imported samples contained no detectable residues. Multiple residues were detected in 152 (32%) of domestic and 146 (51%) of imported samples. The limit of quantitation was set at 0.01 microgram/g and the limit of detection was 0.001 microgram/g. Most of the residues were present at low concentrations; 70% of detections in domestic samples were <0.05 microgram/g, and 97% were <0.5 microgram/g. Although 86% of antifungal agent residues in imported citrus fruits were greater than or equal to 0.1 microgram/g, 59% of the other residues in imported samples were <0.05 microgram/g, and 96% were <0.5 microgram/g. Violations of maximum residue limits (MRL) were observed in 3 samples: diazinon in chrysanthemums, dieldrin in cucumbers, and bitertanol in bananas. Of the detectable residues above 0.01 microgram/g, 55% in domestic and 38% in imported samples were <10% of the MRL. Of all the samples, 2.4% contained more than 5 different pesticides; tomatoes, strawberries, apples, and citrus fruits tended to have more multiple residues.

Record 3
AU: Zhang,-G.; Miura,-Y.; Yagasaki,-K.
TI: Induction of apoptosis and cell cycle arrest in cancer cells by in vivo metabolites of teas.
SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 38 (2) p. 265-273.

Record 4
AU: Qin,-G.; Ning,-Y.; Lotlikar,-P.D.
TI: Chemoprevention of aflatoxin B1-initiated and carbon tetrachloride-promoted hepatocarcinogenesis in the rat by green tea.
SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 38 (2) p. 215-222.

Record 5
AU: Hashimoto,-R.; Yaita,-M.; Tanaka,-K.; Hara,-Y.; Kojo,-S.
TI: Inhibition of radical reaction of apolipoprotein B-100 and alpha-tocopherol in human plasma by green tea catechins.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 6380-6383.
AB: (-)-Epicatechin (EC), (-)-epigallocatechin (EGC), (-)-epicatechin gallate (ECg), (-)-epigallocatechin gallate (EGCg), and Trolox inhibited the decreases of apolipoprotein B-100 (apoB) and alpha-tocopherol in a radical reaction of human plasma initiated by Cu(2+). The concentrations of EC, EGC, ECg, EGCg, and Trolox for 50% inhibition (IC50) of apoB fragmentation were 39.1, 42.2, 14.6,

21.3, and 36.2 micromolar, respectively. Similar IC50 values were observed for alpha-tocopherol consumption, indicating the close relationship between apoB fragmentation and alpha-tocopherol consumption. These results demonstrate that tea catechins serve as an effective antioxidant in plasma and that the gallate group has a strong antioxidative activity.

Record 6
AU: Li,-C.; Xie,-B.
TI: Evaluation of the antioxidant and pro-oxidant effects of tea catechin oxypolymers.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 6362-6366.
AB: Tea catechin oxypolymers (TCOP) were prepared by oxidizing tea catechin (TC, the content of EGCG was >85%) with H2O2. Their antioxidant and pro-oxidant effects were tested using a deoxyribose assay, a photoreduction of NBT assay, a lipoxygenase assay, a POV assay, and animal tests. The scavenging effects of TCOP to both the hydroxyl radical and superoxide radical were stronger than that of TC, and also they had no pro-oxidant effect; the rate constant for reactions of TC and TCOP for hydroxyl radical were 1.0 x 10(10) and (1.4-2.8) x 10(10) M(-1) S(-1), respectively. TCOP can inhibit lipid peroxidation and lipoxygenase effectively, and it also can activate red cell SOD and reduce the MDA content in serum of mice very significantly. These results suggested that the antioxidant activity of TCOP was not less than or even more notable than that of TC.

Record 7
AU: Kurota-Niwa,-R.; Inoue,-S.; Ogawa,-S.; Muramatsu,-M.; Nozawa,-R.
TI: Effects of tea catechins on the ERE-regulated estrogenic activity.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 6355-6361.
AB: Tea catechins exert many biological effects, including anticancer and antibacterial activities. Also, it is reported that some plant flavonoids exhibit estrogenic activity. In this study, we investigated estrogenic or antiestrogenic activities of catechins in HeLa cells transiently transfected with an estrogen response element (ERE)-regulated luciferase reporter and an estrogen receptor (ER) alpha or ERbeta expression vector. Catechins alone did not induce luciferase (luc) activity in either of the ERs. Addition of 17beta-estradiol (E2) plus epicatechin gallate (ECG) or epigallocatechin gallate (EGCG) at 5 x 10(-6) M resulted in significant decreases in the ERalpha-mediated luc activity compared with that of E2 alone. On the contrary, lower concentrations significantly increased the E2-induced luc activity. Similar effects were observed with tamoxifen. The ERbeta-mediated estrogenic activities were stimulated by catechins. In conclusion, some catechins, particularly EGCG, were antiestrogenic for ERalpha at higher doses, and co-estrogenic for ERalpha at lower doses and for ERbeta. The lower doses were found in human plasma after tea-drinking. In addition, some catechins may be antiendocrine disruptors because they suppressed bisphenol A-induced luc activities.

Record 8
AU: Pan,-M.H.; Liang,-Y.C.; Lin-Shiau,-S.Y.; Zhu,-N.Q.; Ho,-C.T.; Lin,-J.K.
TI: Induction of apoptosis by the oolong tea polyphenol theasinensin A through cytochrome c release and activation of caspase-9 and caspase-3 in human U937 cells.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 6337-6346.
AB: This study examined the growth inhibitory effects of theasinensin A (from oolong tea) and black tea polyphenols, including theaflavin (TF-1), a mixture (TF-2) of theaflavin-3-gallate (TF-2a) and theaflavin-3'-gallate (TF-2b), and theaflavin-3,3'-digallate (TF-3) in human cancer cells. Theasinensin A, TF-1, and TF-2 displayed strong growth inhibitory effects against human histolytic lymphoma U937, with estimated IC50 values of 12 micromolar, but were less effective against human acute T cell leukemia Jurkat, whereas TF-3 and (-)-

epigallocatechin-3-gallate (EGCG) had lower activities. The molecular mechanisms of tea polyphenol-induced apoptosis as determined by annexin V apoptosis assay, DNA fragmentation, and caspase activation were further investigated. Loss of membrane potential and reactive oxygen species (ROS) generation were also detected by flow cytometry. Treatment with tea polyphenols caused rapid induction of caspase-3, but not caspase-1, activity and stimulated proteolytic cleavage of poly(ADP-ribose) polymerase (PARP). Pretreatment with a potent caspase-3 inhibitor, Z-Asp-Glu-Val-Asp-fluoromethyl ketone, inhibited theasinensin A induced DNA fragmentation. Furthermore, it was found that theasinensin A induced loss of mitochondrial transmembrane potential, elevation of ROS production, release of mitochondrial cytochrome c into the cytosol, and subsequent induction of caspase-9 activity. These results indicate that theasinensin A allows caspase-activated deoxyribonuclease to enter the nucleus and degrade chromosomal DNA and induces DFF-45 (DNA fragmentation factor) degradation. The results suggest that induction of apoptosis by theasinensin A may provide a pivotal.
mechanism for their cancer chemopreventive function.

Record 9
AU: Sawai,-Y.; Moon,-J.H.
TI: NMR analytical approach to clarify the molecular mechanisms of the antioxidative and radical-scavenging activities of antioxidants in tea using 1,1-diphenyl-2-picrylhydrazyl.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 6247-6253.
AB: (+)-Catechin, ethyl gallate, ascorbic acid, and alpha-tocopherol were reacted with 1,1-diphenyl-2-picrylhydrazyl (DPPH), and the reaction mixtures were subjected to 13C-nuclear magnetic resonance (NMR) analyses to clarify the molecular mechanisms of the antioxidative and radical-scavenging activities of each antioxidant. When ascorbic acid was reacted with DPPH, it was oxidized to dehydroascorbic acid by DPPH. When a mixture of ascorbic acid and (+)-catechin was reacted with DPPH, ascorbic acid scavenged DPPH radical faster than (+)-catechin. Ascorbic acid also scavenged DPPH radical faster than ethyl gallate and alpha-tocopherol. When (+)-catechin was reacted with DPPH, the B-ring of (+)-catechin changed to an o-quinone structure. However, it was reduced to (+)-catechin by ethyl gallate or alpha-tocopherol. alpha-Tocopherol and ethyl gallate had almost identical antioxidative activities. Therefore, the order of radical-scavenging ability (speed) suggested by our 13C NMR study was as follows: ascorbic acid > alpha-tocopherol = ethyl gallate > (+)-catechin.

Record 10
AU: Okai,-Y.; Higashi-Okai,-K.
TI: Protective effects of chlorophyll a and pheophytin a derived from green tea (Camellia sinensis) on p-nonylphenol-induced cell growth inhibition and oxygen radical generation in yeast (Saccharomyces cerevisiae).
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Dec 2001. v. 81 (15) p. 1443-1446.
AB: We recently reported that the endocrine disruptor p-nonylphenol (NP) caused suppressive effects on cell growth and cellular respiration in the yeast Saccharomyces cerevisiae and that these effects were associated with NP-induced oxygen radical generation (Okai Y et al, FEMS Microbiol Lett 185:65-70 (2000)). In the present study we found preventive effects of photosynthetic pigments chlorophyll a and pheophytin a from green tea (Camellia sinensis) on NP-induced inhibition of cell growth and cellular respiration in yeast. Their preventive activities were much higher than those of a synthetic sodium-copper salt form of chlorophyll, chlorophyllin. These pigments also prevented NP-induced oxygen radical generation in yeast cells, showing suppressive activities proportional to their preventive activities against inhibition of cell growth and cellular respiration. The significance of this finding is discussed from the viewpoint of protective activity of photosynthetic pigments against endocrine disruptor-induced harmful effects.

Record 11
AU: Fiedler,-H.; Cheung,-C.K.; Wong,-M.H.
TI: PCDD/PCDF, chlorinated pesticides and PAH in Chinese teas.
SO: Chemosphere. Kidlington, Oxford, U.K. : Elsevier Science Ltd. Mar 2002. v. 46 (9/10) p. 1429-1433.

Record 12
AU: Mukhtar,-H.; Ahmad,-N.
TI: Tea polyphenols: prevention of cancer and optimizing health.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. June 2000. v. 71 (6S) p. 1698S-1702S.

Record 13
AU: Yang,-C.S.; Landau,-J.M.
TI: Effects of tea consumption on nutrition and health.
SO: J-nutr. Bethesda : American Society for Nutritional Sciences. Oct 2000. v. 130 (10) p. 2409-2412.

Record 14
AU: Heijnen,-C.G.M.; Haenen,-G.R.M.M.; Wiseman,-S.A.; Tijburg,-L.B.M.; Bast,-A.
TI: The interaction of tea flavonoids with the NO-system: discrimination between good and bad NO.
SO: Food-chem. Oxford : Elsevier Science Limited. Aug 15, 2000. v. 70 (3) p. 365-370.

Record 15
AU: Wang,-H.; Helliwell,-K.
TI: Epimerisation of catechins in green tea infusions.
SO: Food-chem. Oxford : Elsevier Science Limited. Aug 15, 2000. v. 70 (3) p. 337-344.

Record 16
AU: Trichopoulou,-A.; Naska,-A.; Vasilopoulou,-E.
TI: Guidelines for the intake of vegetables and fruit: the Mediterranean approach.
SO: Int-j-vitam-nutr-res. Bern : Hogrefe & Huber Publishers. May 2001. v. 71 (3) p. 149-153.
AB: Various studies have demonstrated that the nutrient and non-nutrient substances present in vegetables and fruit (V&F) are most likely to be responsible for the beneficial effect of the increased V&F consumption. Urged by scientific evidence, current dietary guidelines strongly recommend the consumption of V&F in substantial amounts. In a recent paper (Brit. J. Nutr. 2000; 84, 549-556) V&F availability in 10 European countries was compared with the WHO recommendations (minimum combined V&F intake of about 400 g/day/person), as well as with guidelines of a minimum daily intake of three portions of vegetables (approx. 250 g/person) and two portions of fruit (approx. 150 g/person). All countries, excluding Greece, had a vegetable intake below the recommended minimum. Moreover, in all countries, the percentages of low vegetable intake below the recommended minimum. Moreover, in all countries, the percentages of low vegetable consumers were significantly higher than those of low fruit consumers, suggesting that there is considerable room for improvement in the intake of vegetables, an important source of antioxidants. Wild edible greens are among the vegetables commonly consumed in Greece. These greens have a high flavonoid content, which in several cases substantially exceeds the respective values in foods and beverages, such as onions, black tea and red wine (Food Chemistry 2000; 70, 319-323). The high flavonoid content of edible wild greens requires consideration of their role in contemporary diet, as a possible mean for increasing vegetable consumption.

Record 17

AU: Kordes,-W.
TI: Hybrid tea rose plant named 'Korsulas'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. May 30, 2000. (11,393) 2 p.
AB: Abstract: Hybrid tea rose plant having long stems; novel, greenish-yellow flower color in the bud; good vase life; moderate to strong fragrance; and good cut flower production.

Record 18
AU: Carruth,-T.F.
TI: Hybrid tea rose plant named 'Wekcryland'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. May 16, 2000. (11,384) 3 p.
AB: Abstract: A new variety of Hybrid Tea rose suitable for garden decoration, having flowers of white coloration with a very fine pink edging.

Record 19
AU: Winchel,-J.F.
TI: Hybrid tea rose plant named 'Wekwinwin'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. May 16, 2000. (11,382) 2 p.
AB: Abstract: A new variety of Hybrid Tea rose suitable for garden decoration, having flowers of bright red coloration with a reverse petal coloration of yellow.

Record 20
AU: Ferrer,-M.
TI: Hybrid tea rose plant named 'Febesa'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 26, 2000. (11,529) 2 p.
AB: Abstract: A new and distinct variety of Hybrid Tea rose plant is provided which abundantly forms attractive blossoms which are stable light pink in coloration and very clean in appearance. The buds are large, and are borne on straight erect stems. Attractive semi-glossy medium green foliage is formed. The new variety is particularly well suited for forming cut flowers on a highly productive basis under greenhouse growing conditions.

Record 21
AU: Twomey,-J.F.
TI: Hybrid tea rose plant named 'Twoyel'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 26, 2000. (11,528) 2 p.
AB: Abstract: A new rose cultivar of the Hybrid Tea class characterized by having deep, pure non-fading yellow flowers with a strong persistent spicy fragrance on a very upright plant. This plant has been designated as 'TVOYEL'. It is being marketed in the USA under the tradename of 'Dream Yellow'.

Record 22
AU: Twomey,-J.
TI: Hybrid tea rose plant named 'TWOAT'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 26, 2000. (11,527) 2 p.
AB: Abstract: A new rose cultivar of the Hybrid Tea class characterized by having Camelia like pink flowers with light sweet perfume. Very uniform bush 100 to 150 cm in height with early and continuous blooming. This plant has been designated as 'Twoat'.

Record 23
AU: Twomey,-J.
TI: Hybrid tea rose plant named 'TWOAEBI'.

SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 26, 2000. (11,525) 2 p.
AB: Abstract: A new rose cultivar of the Hybrid Tea class characterized by having a very double, very long lasting, non-fading, orange flower, with very consistent blooms. This plant has been designated as 'TWOAEBI'. It is being marketed in the USA under the tradename of 'Dream Orange'.

Record 24
AU: Twomey,-J.F.
TI: Hybrid tea rose plant named 'Twojoan'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 26, 2000. (11,524) 2 p.
AB: Abstract: A new rose cultivar of the Hybrid Tea class characterized by having large pink flowers on a very vigorous, healthy plant with very glossy foliage. This plant has been designated as 'TWOJOAN'. It is being marketed in the USA under the tradename of 'Dream Pink'.

Record 25
AU: Pouw,-A.A.
TI: Hybrid tea rose plant named 'Ruitica'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Mar 21, 2000. (11,304) 2 p.
AB: A new variety of hybrid tea rose plant producing pale yellow flowers.

Record 26
AU: Segers,-T.A.
TI: Hybrid tea rose plant named 'Presur'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Feb 29, 2000. (11,247) 2 p.
AB: Abstract: A distinct cultivar of hybrid tea rose plant named 'Presur', characterized by its large soft orange flowers; pleasant fragrance; freely branching plant habit with numerous flowering stems per plant; long stem length; and excellent postproduction longevity.

Record 27
AU: Wollgast,-J.; Anklam,-E.
TI: Polyphenols in chocolate: is there a contribution to human health.
SO: Food-res-int. Oxford : Elsevier Science Ltd. 2000. v. 33 (6) p. 449-459.
AB: Recently, polyphenols have gained much more attention, owing to their antioxidant capacity (free radical scavenging and metal chelating) and their possible beneficial implications in human health, such as in the treatment and prevention of cancer, cardiovascular disease, and other pathologies. Cocoa is rich in polyphenols particularly in catechins (flavan-3-ols) and procyanidins. Polyphenol contents of cocoa products such as dark chocolate, milk chocolate and cocoa powder have been published only recently. However, the data vary remarkably due to the quantity of cocoa liquor used in the recipe of the cocoa products but also due to the analytical procedure employed. For example, results obtained by a colourimetric method were 5-7 times higher for the same type of product than results obtained by high performance liquid chromatography (HPLC). In 1994, the per head consumption of chocolate and chocolate confectionery in the European Union ranged from 1.3 kg/year in Portugal to 8.8 kg/year in Germany. In general, consumers in the Northern countries consume on average more than people in the South. Thus, chocolate can be seen as a relevant source for phenolic antioxidants for some European population. However, this alone does not imply, that chocolate could be beneficial to human health. Some epidemiological evidence suggests a beneficial effect to human health by following a polyphenol-rich diet, namely rich in fruits and vegetables and to a less obvious extent an intake of tea and wine having a similar polyphenol composition as cocoa. In many experiments cellular targets have been identified and molecular mechanisms of disease prevention proposed, in particular for the prevention of cancer and.

cardiovascular diseases as well as for alleviating the response to inflammation reactions. However, it has to be demonstrated, whether polyphenols exert these effects in vivo. One pre-requisite is that the polyphenols are absorbed from the diet. For monomeric flavonoids such as the catechins, there is increasing evidence for their absorption. For complex phenols and tannins (procyanidins) these questions have to be addressed for the future. Some indication for the absorption of procyanidins derive from studies with the human colon cancer cell line Caco-2, believed to be a valuable model for passive intestinal absorption as proposed for polyphenols. However, it has to be clarified which concentration is effective and what concentrations can be expected from food intake. Another open question is related to polyphenol metabolism. For example, much effort has been invested to show antioxidative effects of free unbound polyphenols, especially of catechins and the flavonol quercetin. However, only a very small part can be found in plasma in the free form but conjugated or even metabolised to several phenolic acids and other ring scission products. From the papers reviewed, it is as yet to early to give an answer to the question, whether chocolate and/or other sources rich in catechins and procyanidins are beneficial to human health. Even though some data are promising and justify further research in the field, it has to be shown in future, whether the intake of these functional compounds and/or their sources is related to measurable effects on human health and/or the development of diseases.

Record 28
AU: Wollgast,-J.; Anklam,-E.
TI: Review on polyphenols in Theobroma cacao: changes in composition during the manufacture of chocolate and methodology for identification and quantification.
SO: Food-res-int. Oxford : Elsevier Science Ltd. 2000. v. 33 (6) p. 423-447.
AB: Polyphenols have become an intense focus of research interest because of their perceived health-beneficial effects, such as anticarcinogenic, anti-atherogenic, anti-inflammatory, anti-microbial, etc. Polyphenols in green and black tea, grape seeds, grapes and (red) wine have raised much attention but chocolate has not been investigated intensively up to now. This review is concerned with polyphenols in Theobroma cacao, the change in composition and quantity during fermentation, drying, and the manufacture of chocolate, as well as with analytical methods for isolation, characterisation and quantification. Cocoa beans are rich in polyphenols in particular catechins and proanthocyanidins. However, a sharp decrease in quantity occurs during fermentation and drying of cocoa beans and further retention has been reported Juring roasting. Characterisation and in particular quantification of polyphenols in chocolate has only been developed relatively recently. This work reviews further on the literature on the available methodology for analysis, quantification, isolation, purification, and structure elucidation of polyphenols in cocoa components and other commodities. Concerning the analytical methods main emphasis is put on HPLC as it is usually the method of choice due to its high resolution, high efficiency, high reproducibility and relatively short analysis time without restriction on sample volatility. Moreover, HPLC can be coupled to a variety of detectors such as UV-Vis, photodiode array (PDA), fluorescence, electrochemical (ECD), and mass spectrometry (MS). However, TLC as a screening method and capillary electrophoresis (CE) as a promising tool is taken into consideration as well. The.
characterisation and quantification of the polyphenol composition is amongst the first steps to be done to evaluate a putative contribution of chocolate to human health.

Record 29
AU: Dufresne,-C.; Farnworth,-E.
TI: Tea, Kombucha, and health: a review.
SO: Food-res-int. Oxford : Elsevier Science Ltd. 2000. v. 33 (6) p. 409-421.
AB: Kombucha is a refreshing beverage obtained by the fermentation of sugared tea with a symbiotic culture of acetic bacteria and fungi, consumed for its

beneficial effects on human health. Research conducted in Russia at the beginning of the century and testimony indicate that Kombucha can improve resistance against cancer, prevent cardiovascular diseases, promote digestive functions, stimulate the immune system, reduce inflammatory problems, and can have many other benefits. In this paper, we report on studies that shed more light on the properties of some constituents of Kombucha. The intensive research about the effects of tea on health provide a good starting point and are summarized to get a better understanding of the complex mechanisms that could be implicated in the physiological activity of both beverages.

Record 30
AU: Sato,-J.; Takano,-K.
TI: Identification of filamentous fungi isolated from aseptic filling system for tea beverages and their microbiological characteristics.
SO: Food-sci-technol-res. Tsukuba, Ibaraki : Japanese Society for Food Science and Technology, c1999-. Feb 2000. v. 6 (1) p. 48-53.

Record 31
AU: McGredy,-S.D.
TI: Hybrid tea rose plant named 'Mactaurang'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Aug 15, 2000. (11,484) 2 p.
AB: Abstract: A hybrid tea rose plant having tall, upright growing habit; dark green, glossy foliage; coral orange and light yellow striped flower (upper surface); light yellow petal reverse; long cutting stems; and resistance to rose rust.

Record 32
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacshaq'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Aug 15, 2000. (11,482) 2 p.
AB: Abstract: Hybrid tea rose plant having a vigorous, upright growth habit; long stems; large, well-formed flowers; dark green, glossy foliage; and spicy fragrance.

Record 33
AU: Fazari,-E.
TI: Hybrid tea rose plant named 'Fazcanne'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Aug 15, 2000. (11,480) 2 p.
AB: Hybrid tea rose plant having long stems; dark green, healthy foliage; bright red flowers; good cut flower production; good vase life; and good shipping ability.

Record 34
AU: Meilland,-A.A.
TI: Hybrid tea rose plant named 'Meizincaro'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Nov 28, 2000. (11,660) 2 p.
AB: Abstract: A new and distinct variety of Hybrid Tea rose plant is provided which forms on an abundant and substantially continuous basis attractive fragrant double blossoms that are Cardinal Red in coloration. The plant exhibits bushy growth habit, glossy foliage, and excellent disease resistance. The new variety is particularly well suited for growing as attractive ornamentation in parks and gardens.

Record 35
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacfehon'.

SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Nov 7, 2000. (11,617) 2 p.
AB: Hybrid rose plant having novel apricot colored flowers of large size on long stems; a long vase life; and large foliage.

Record 36
AU: Schuurman,-F.
TI: Hybrid tea rose plant named 'Suntick'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. June 6, 2000. (11,400) 2 p.
AB: Abstract: A hybrid tea rose variety producing pink flowers.

Record 37
AU: Wells,-V.W.
TI: Miniature rose plant named 'Welqueen'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Nov 21, 2000. (11,645) 2 p.
AB: This invention relates to a new and distinct variety of miniature rose plant primarily identified by its white buds and flowers, hybrid tea form and glossy green foliage.

Record 38
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacfetex'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Feb 1, 2000. (11,198) 2 p.
AB: Abstract: Hybrid tea rose having yellow, edged in orange-pink flowers; attractive, long well shaped bud; long open flowers on long stems; good cut flower production; and glossy, dark green foliage.

Record 39
AU: Kordes,-W.
TI: Hybrid tea rose plant named 'Korveco'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 25, 2000. (11,189) 3 p.
AB: Abstract: Hybrid tea rose plant having good production of flowers having a strong, stable color on long stems; the flowers having thick petals and long vase life.

Record 40
AU: Delbard,-G.
TI: Hybrid tea rose plant named 'Delverbla'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 18, 2000. (11,184) 3 p.
AB: Abstract: A new and distinct variety of Hybrid Tea rose plant is provided that abundantly forms attractive double flowers which are greenish-white at the bud stage and finish to white when completely open. This blossom coloration is believed to be unique for this class of rose. The buds are very long. Such flowers exhibit a good vase life and posses petals that detach cleanly. The plant exhibits a bushy growth habit, forms long straight stems, forms semi-vigorous vegetation, and is particularly well suited for greenhouse forcing for cut flower production. Additionally, the plant is resistant to diseases when grown under greenhouse conditions.

Record 41
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacrove'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Dec 26, 2000. (11,715) 2 p.

AB: Abstract: Hybrid tea rose plant having the large, bright red flowers; upright, well-branched growth habit; dark green, glossy foliage; and disease resistance to rose rust, but susceptibility to powdery mildew and blackspot.

Record 42
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacnepal'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Dec 12, 2000. (11,691) 2 p.
AB: Abstract: A hybrid tea rose plant having vigorous, upright growth; large flowers produced one per stem; mildew and rust resistant foliage; a blend of colors in the flower; and stems long enough for cutting.

Record 43
AU: Zary,-K.W.
TI: Hybrid tea rose plant 'Jacecond'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. May 2, 2000. (11,369) 2 p.
AB: A new and distinct variety of rose plant of the hybrid tea class having high-centered red flowers presented singly (one to a stem), numerous thorns, vigorous, upright, well branched habit of growth, and dark green, leathery foliage.

Record 44
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacunu'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Nov 14, 2000. (11,634) 2 p.
AB: Abstract: Hybrid tea rose plant having strong, vigorous, upright growth, very good cut flower production of flowers of heavy petal substance on long, strong stems having long vase life.

Record 45
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacfango'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Nov 14, 2000. (11,633) 2 p.
AB: Hybrid tea rose plant having novel yellow bud and flower color, good production of long stemmed, cut flowers having excellent vase life and resistance to powdery mildew.

Record 46
AU: Twomey,-J.F.
TI: Hybrid tea rose plant named 'Twopaul'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 5, 2000. (11,503) 2 p.
AB: Abstract: A new rose cultivar of the Hybrid Tea class characterized by having a red flower with heavy petal substance, non-fading, compact plant, free and continuous bloomer. This plant has been designated as 'TWOPAUL'. It is being marketed in the USA under the tradename of 'Dream Red'.

Record 47
AU: Delbard,-G.
TI: Hybrid tea rose plant named 'Delstricycla'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Sept 5, 2000. (11,502) 3 p.
AB: A new and distinct variety of Hybrid Tea rose plant is provied that abundantly and nearly continuously forms attractive double flowers which are pink striped with white. The plant is well suited for cut flower production in the greenhouse. This blossom coloration is believed to be unique for greenhouse roses. The buds are large and ovate in configuration. The flowers exhibit a good

vase life and possess petals that detach cleanly. The plant exhibits a bushy to upright growth habit, forms long straight stems and straight peduncles and forms vigorous vegetation. Additionally, the plant is resistant to disease when grown under greenhouse conditions.

Record 48
AU: Segers,-T.A.
TI: Hybrid tea rose plant named 'Preveris'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Feb 29, 2000. (11,256) 2 p.
AB: Abstract: A distinct cultivar of hybrid tea rose plant named 'Preveris', characterized by its large yellow and orange flowers; long and strong stems; dark green leaves; and good postproduction longevity.

Record 49
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jachov'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Feb 15, 2000. (11,222) 2 p.
AB: Abstract: A hybrid tea rose plant having bicolor flowers that are pink on the upper side and yellow on the reverse; a vigorous, upright growth habit; hybrid tea flower form; and moderate fragrance.

Record 50
AU: Moerenhout,-E.
TI: Hybrid tea rose plant named 'Moerigna'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Feb 8, 2000. (11,216) 3 p.
AB: Abstract: A new and distinct variety of Hybrid Tea rose plant is provided that abundantly forms attractive double flowers that are bicolored orange veined with yellow in coloration. The buds are very long and are slow opening. Such flowers exhibit a good vase life and possess petals that detach cleanly. The plant exhibits a narrow bushy growth habit, forms semi-vigorous vegetation, and is particularly well suited for greenhouse forcing for cut flower production. Additionally, the plant is resistant to diseases when grown under greenhouse conditions.

Record 51
AU: Pouw,-A.A.
TI: Hybrid tea rose plant named 'Ruiliro'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 11, 2000. (11,175) 2 p.
AB: Abstract: A new variety of hybrid tea rose plant producing pik blend flowers.

Record 52
AU: Pouw,-A.A.
TI: Hybrid tea rose plant named 'Pansomro'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 4, 2000. (11,171) 2 p.
AB: A new variety of hybrid tea rose plant producing pink blend flowers of good form and suitable for growing under glass.

Record 53
AU: Schreurs,-P.N.J.
TI: Hybrid tea rose plant named 'Schomi'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 4, 2000. (11,169) 2 p.
AB: Abstract: A new rose plant named 'Schomi' characterized by long stems measuring approximately 90 cm; a distinctive petal color of R.H.S. 55D on the

upperside and R.H.S. 38A on the underside; double-type flower with 35-40 petals per flower.

Record 54
AU: Olij,-H.W.
TI: Hybrid tea rose plant named 'Olijglu'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Aug 22, 2000. (11,494) 2 p.
AB: Abstract: A new and distinct variety of Hybrid Tea rose plant is provided which abundantly forms attractive blossoms which are a blend of pink, cream and green and exhibit a long vase life. The buds are large, and are borne on erect stems. Attractive semi-glossy dark green foliage is formed, and the plant exhibits very good disease resistance. The new variety is particularly well suited for forming cut flowers on a highly productive basis under greenhouse growing conditions.

Record 55
AU: Pouw,-A.A.
TI: Hybrid tea rose plant named 'Ruipinvi'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Mar 7, 2000. (11,278) 2 p.
AB: A new variety of hybrid tea rose plant producing pink flowers of good form.

Record 56
AU: Segers,-T.A.
TI: Hybrid tea rose plant named 'Pretaner'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Mar 7, 2000. (11,272) 2 p.
AB: A distinct cultivar hybrid tea of rose plant named 'Pretaner', characterized by its large light yellow to white flowers; freely branching plant habit; long stem length; and excellent postproduction longevity.

Record 57
AU: Kordes,-W.
TI: Hybrid tea rose plant named 'Korlette'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Mar 7, 2000. (11,271) 2 p.
AB: Hybrid tea rose plant having large, novel bi-colored flowers of good petal count and strong fragrance and an angular vigorous growth habit.

Record 58
AU: Zary,-K.W.
TI: Hybrid tea rose plant named 'Jacolber'.
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Mar 7, 2000. (11,265) 2 p.
AB: Abstract: Hybrid tea rose plant has long stems ideal for cutting; dark green, glossy foliage; bright red flowers of good hybrid tea flower form; and resistance to rust and powdery mildew.

Record 59
AU: Mattila,-P.; Astola,-J.; Kumpulainen,-J.
TI: Determination of flavonoids in plant material by HPLC with diode-array and electro-array detections.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Dec 2000. v. 48 (12) p. 5834-5841.
AB: A high-performance liquid chromatographic (HPLC) method with in-line connected diode-array (DAD) and electro-array (EC) detection to identify and quantify 17 flavonoids in plant-derived foods is described. Catechins were extracted from the samples using ethyl acetate, and quantification of these compounds was performed with the EC detector. Other flavonoids were quantified with DAD after acid hydrolysis. The methods developed were effective for the

determination of catechins and other flavonoids in plant-derived foods. Responses of the detection systems were linear within the range evaluated, 20-200 ng/injection (DAD) and 20-100 ng/injection (EC), with correlation coefficients exceeding 0.999. Coefficient of variation was under 10.5%, and recoveries of flavonoids ranged from 70 to 124%. Purity of the flavonoid peaks was confirmed by combining the spectral and voltammetric data.

Record 60
AU: Serafini,-M.; Laranjinha,-J.A.N.; Almeida,-L.M.; Maiani,-G.
TI: Inhibition of human LDL lipid peroxidation by phenol-rich beverages and their impact on plasma total antioxidant capacity in humans.
SO: J-nutr-biochem. New York, N.Y. : Elsevier Science Inc. Nov/Dec 2000. v. 11 (11/12) p. 585-590.
AB: Mounting evidence shows that phenol-rich beverages exert strong antioxidant activity. However, in vivo evidence has produced conflicting results. In the present study, we studied the impact of the ingestion of 300 mL of black and green tea, alcohol free red wine, alcohol free white wine, or water on plasma total antioxidant capacity in five healthy volunteers. Red wine has the highest content of phenolics (3.63 +/- 0.48 g QE/L), followed by green tea (2.82 +/- 0.07 g QE/L), black tea (1.37 +/- 0.15 g QE/L), and white wine (0.31 +/- 0.01 g QE/L). Plasma total antioxidant capacity values of subjects who drank green tea rose at 30 min ($P < 0.05$). After black tea and red wine ingestion, the peaks were at 50 min ($P < 0.05$ and $P < 0.01$, respectively). No changes were observed in the control and white wine groups. Red wine and green tea were the most efficient in protecting low density lipoprotein from oxidation driven by peroxyl and ferril radicals, respectively. Phenol-rich beverages are a natural source of antioxidants; however, the phenolic content alone cannot be considered an index of their in vivo antioxidant activity.

Record 61
AU: Ismail,-M.; Manickam,-E.; Danial,-A.M.; Rahmat,-A.; Yahaya,-A.
TI: Chemical composition and antioxidant activity of Strobilanthes crispus leaf extract.
SO: J-nutr-biochem. New York, N.Y. : Elsevier Science Inc. Nov/Dec 2000. v. 11 (11/12) p. 536-542.
AB: This study investigated the components present in and the total antioxidant activity of leaves of Strobilanthes crispus (L.) Bremek or Saricocalyx crispus (L.) Bremek (Acanthacea). Proximate analyses and total antioxidant activity using ferric thiocyanate and thiobarbituric acid methods were employed. Minerals content was determined using the atomic absorption spectrophotometer, whereas the water-soluble vitamins were determined by means of the UV-VIS spectrophotometer (vitamin C) and fluorimeter (vitamins B1 and B2). Catechin, tannin, caffeine, and alkaloid contents were also studied. All data were compared to the previously reported results of Yerbamate, green tea, black tea, and Indian tea. The dried leaves contained a high amount of total ash (21.6%) as a result of a high amount of minerals including potassium (51%), calcium (24%), sodium (13%), iron (1%), and phosphorus (1%). High content of water-soluble vitamins (C, B1, and B2) contributed to the high antioxidant activity of the leaves. The leaves also contained a moderate amount of other proximate composition as well as other compounds such as catechins, alkaloids, caffeine, and tannin, contributing further to the total antioxidant activity. Catechins of Strobilanthes crispus leaves showed highest antioxidant activity when compared to Yerbamate and vitamin E. Consumption of the leafy extract daily (5 g/day) as an herbal tea could contribute to the additional nutrients and antioxidants needed in the body to enhance the defense system, especially toward the incidence of degenerative diseases.

Record 62
AU: Hakim,-I.A.; Weisgerber,-U.M.; Harris,-R.B.; Balentine,-D.; Mierlo,-C.A.J.-van.; Paetau-Robinson,-I.

TI: Preparation, composition and consumption patterns of tea-based beverages in Arizona.
SO: Nutr-res. New York, N.Y. : Elsevier Science Inc. Dec 2000. v. 20 (12) p. 1715-1724.
AB: Flavonoids in black and green tea have been implicated in cancer chemoprevention. The concentration of flavonoids in tea is likely to vary by preparation techniques. Inconsistencies between epidemiological studies may arise from the lack of information on methods of preparation. The purpose of this study was to assess the pattern of tea consumption among an older Arizonan population and to determine tea polyphenol and flavonoid levels in the most commonly used tea preparation techniques for a Southwestern US population. A specific tea questionnaire was developed using focus groups and semi-structured interviews. The reliability of the tea questionnaire was very high even after 6 months (r = 0.93 for average tea intake/day). Forty samples, representing the most typical preparation techniques of hot, iced, and sun tea, were analyzed by HPLC for total flavonoids, catechins, theaflavins, thearubigins, caffeine and gallic acid. In black tea, the highest concentrations of flavonoids (microgram/ml) were found in brewed hot tea (range: 541-692) while the lowest concentrations were for instant tea preparations (range: 90-100). Results show that tea concentration, brewing time, and beverage temperature also have major influences on flavonoid concentrations. Use of specific questions focusing on tea preparation and availability of quantitative estimates of tea flavonoids should enhance epidemiological studies of the relationship between tea consumption and disease risk.

Record 63
AU: Hemalatha,-K.; Venugopal,-N.B.K.; Rao,-B.S.
TI: Determination of azadirachtin in agricultural matrixes and commercial formulations by enzyme-linked immunosorbent assay.
SO: J-AOAC-Int. Gaithersburg, MD : AOAC International. July/Aug 2001. v. 84 (4) p. 1001-1010.
AB: An enzyme-linked immunosorbent assay (ELISA) was developed for azadirachtin (aza), a biopesticide from the neem tree (Azadirachta indica A. Juss). The immunogen was synthesized by epoxidation using the furan ring in the aza molecule. Rabbits were immunized with either bovine serum albumin (BSA)-azadirachtin or ovalbumin (OA)-azadirachtin conjugate. Evaluation of the antisera by antibody capture assay showed that the antibody titer of antisera raised against OA-aza was 1:30000. An indirect competitive ELISA was developed with BSA-azadirachtin as coating antigen and aza-specific antibodies raised against OA-aza immunogen. The immunoassay showed an inhibitory concentration (IC50) value of 75 ppb, with a range of detection from 0.5 to 1000 ppb for azadirachtin [based on regression analysis, y = 85.87 (-18.89x); r2 = -0.97]. Cross-reactivity of the antibodies with 2 aza-derivatives (22,23-dihydro-23beta-methoxy azadirachtin and 3-tigloylazadirachtol) was 33 and 29%, respectively. The indirect competitive ELISA was validated and evaluated by quantitating aza in spiked agricultural commodities and from neem formulations. Azadirachtin was spiked into 5 different agricultural commodities: tomato, brinjal, coffee, tea, and cotton seed at 500 and 1000 ppb and recovered at 62-100%. In samples drawn from 6 lots, the aza content in neem-seed kernels ranged from 0.1 to 0.15%; in commercial neem formulations the content ranged from 200 to 2000 ppm. The method developed may be applied to environmental monitoring of aza and quality assurance studies of aza-based commercial formulations.

Record 64
AU: Wrobel,-K.; Wrobel,-K.; Urbina,-E.M.C.
TI: Determination of total aluminum, chromium, copper, iron, manganese, and nickel and their fractions leached to the infusions of black tea, green tea, Hibiscus sabdariffa, and Ilex paraguariensis (mate) by ETA-AAS.
SO: Biol-trace-elem-res. Totowa, N.J. : Humana Press. Winter 2000. v. 78 (1/3) p. 271-280.

Record 65
AU: Hollman,-P.C.H.
TI: Evidence for health benefits of plant phenols: local or systemic effects.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. July 2001. v. 81 (9) p. 842-852.
AB: Plant phenols are mostly products of the phenylpropanoid pathway and comprise a large variety of compounds: cinnamic acids, benzoic acids, flavonoids, proanthocyanidins, stilbenes, coumarins, lignans and lignins. They are strong antioxidants and might prevent oxidative damage to biomolecules such as DNA, lipids and proteins which play a role in chronic diseases such as cancer and cardiovascular disease. Plant phenols may interfere with all stages of the cancer process, potentially resulting in a reduction of cancer risk. Only flavonols have been investigated in observational studies. Five out of seven studies showed an inverse association of flavonol intake with subsequent cardiovascular disease (CVD). A protective effect against cancer was only found in one out of four studies. Thus the epidemiological evidence does not yet allow a firm decision on the involvement of flavonols in the aetiology of either CVD or cancer. The epidemiology of flavonols points to a systemic effect. The epidemiology of tea, as a rich source of various phenols, shows inconsistent data for colon cancer, which also does not support a local effect of plant phenols. The absorption and bioavailability of plant phenols have been inadequately studied. Dietary flavonoids were thought to be poorly absorbed because of their presence as beta-glycosides (conjugates of sugars). However, conjugation with glucose enhanced human absorption. Flavonoids and other plant phenols are extensively metabolised by colonic bacteria: the ring structure is cleaved, giving a range of phenolic acids which are then absorbed. Human studies showed that only about 1% of a well-absorbed flavonoid was excreted with an intact flavonoid backbone into urine.
Major questions to be answered are whether the effective concentrations found in in vitro systems really reflect physiological concentrations.

Record 66
AU: Sud,-R.G.; Baru,-A.
TI: Seasonal variations in theaflavins, thearubigins, total colour and brightness of Kangra orthodox tea (Camellia sinensis (L) O Kuntze) in Himachal Pradesh.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. July 2000. v. 80 (9) p. 1291-1299.
AB: Variations in theaflavins, thearubigins, total colour and brightness of orthodox black tea were studied for four consecutive years (1993-1996) with a view to evaluating the effects of changing weather conditions on the quality of Kangra tea. A degree of withering of 600-650 mg g(-1) during the first, second and fourth seasons was optimal for the development of significantly higher brightness and total colour characteristics. The quality of rainy season teas suffered owing to high chlorophyll content and low degree of withering. Hot air circulation through the withering troughs to assist evaporation of leaf moisture increased the brightness and total colour of rainy season teas. High atmospheric demand during the dry season assisted loss of green leaf moisture, but withering and brightness exhibited significant negative correlations with high relative humidity and rainfall. Summer season teas were superior in their total colour and brightness.

Record 67
AU: Paquay,-J.B.G.; Haenen,-G.R.M.M.; Stender,-G.; Wiseman,-S.A.; Tijburg,-L.B.M.; Bast,-A.
TI: Protection against nitric oxide toxicity by tea.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5768-5772.
AB: It is found that green tea and black tea are able to protect against nitric oxide toxicity in several ways. Both green tea and black tea scavenge nitric oxide and peroxynitrite, inhibit the excessive production of nitric oxide by the

inducible form of nitric oxide synthase (iNOS), and suppress the LPS-mediated induction of iNOS. The nitric oxide scavenging activity of tea was less than that of red wine. The high activity found in the polyphenol fraction of black tea (BTP) could not be explained by the mixed theaflavin fraction (MTF) or catechins [epicatechin, epigallocatechin, epicatechin gallate, epigallocatechin gallate (EGCG)], which were tested separately. Synergistic effects between the compounds, or the presence of a potent, unidentified nitric oxide scavenger, may explain the high activity of BTP. The peroxynitrite scavenging of tea was comparable to that of red wine. The main activity was found in the polyphenol fraction. MTF and the catechins were found to be potent peroxynitrite scavengers. Tea and tea components were effective inhibitors of iNOS. Of the tea components tested, only MTF had an activity higher than that of the tea powders. The polyphenol fractions of tea were much more active than the tea powders in suppressing the induction of iNOS. On the basis of its abundance and activity, EGCG was the most active inhibitor. The protective effect of tea on nitric oxide toxicity is discussed in relation to the beneficial effect of flavonoid intake on the occurrence of cardiovascular heart disease.

Record 68
AU: Chen,-C.; Tang,-H.R.; Sutcliffe,-L.H.; Belton,-P.S.
TI: Green tea polyphenols react with 1,1-diphenyl-2-picrylhydrazyl free radicals in the bilayer of liposomes: direct evidence from electron spin resonance studies.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5710-5714.
AB: Free radical scavenging reactions of green tea polyphenols (GTP) were investigated with electron spin resonance (ESR) spectroscopy in the phospholipid bilayer of liposomes, using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical as a model. The results showed that (1) GTP reacts with DPPH radicals in the bilayer of liposomes of both 1-hexadecanoyl-2-[(cis,cis,cis,cis,cis,cis)-4,7,10,13,16,19-docosahexaenoyl]- sn-glycero-3-phosphocholine (DHAPC) and 1,2-di[cis-9-hexadecenoyl]-sn-glycero-3-phosphocholine) (DPPC); and (2) GTP protects DHAPC liposomes effectively from the oxidation initiated by DPPH radicals. These results provide direct evidence that GTP reacts with free radicals in the model membrane and support the hypothesis that GTP protects unsaturated phospholipids from oxidation by reacting directly with the radicals.

Record 69
AU: Suzuki,-M.; Yoshino,-K.; Maeda-Yamamoto,-M.; Miyase,-T.; Sano,-M.
TI: Inhibitory effects of tea catechins and O-methylated derivatives of (-)-epigallocatechin-3-O-gallate on mouse type IV allergy.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5649-5653.
AB: The inhibitory effects of tea catechins, the O-methylated derivatives of (-)-epigallocatechin-3-O-gallate (EGCG), and the polyphenol extracts from tea leaves (Camellia sinensis L.) on oxazolone-induced type IV allergy in male ICR mice were investigated. Four major tea catechins and two O-methylated derivatives, (-)-epigallocatechin-3-O-(3-O-methyl)gallate (EGCG3"Me) and (-)-epigallocatechin-3-O-(4-O-methyl)gallate (EGCG4"Me), showed significant inhibitory effects on mouse type IV allergy after a percutaneous administration at a dose of 0.13 mg/ear. Among tea catechins, the compounds including galloyl moieties, such as EGCG and (-)-epicatechin-3-O-gallate (ECG), showed the strongest inhibitory activities on mouse type IV allergy. The inhibitory activities of EGCG3"Me and EGCG4"Me were higher than that of EGCG at a dose of 0.05 mg/ear. Polyphenol extract from tea leaves of Benihomare cultivar, which includes EGCG3"Me, strongly inhibited mouse type IV allergy after percutaneous administration in comparison with that from Yabukita cultivar, which does not include EGCG3"Me, at doses of 0.05 and 0.13 mg/ear. EGCG3"Me is thought to contribute, at least in part, to the inhibitory ability of Benihomare tea leaves on mouse type IV allergy. EGCG and the polyphenol extracts from Benihomare and Yabukita tea leaves also inhibited mouse type IV allergy by oral administration

at 1 h before the sensitization and at 1 h before the challenge with oxazolone. Therefore, daily intake of tea drinks could have potential to prevent type IV allergy.

Record 70
AU: Kobayashi,-Y.; Suzuki,-M.; Satsu,-H.; Arai,-S.; Hara,-Y.; Suzuki,-K.; Miyamoto,-Y.; Shimizu,-M.
TI: Green tea polyphenols inhibit the sodium-dependent glucose transporter of intestinal epithelial cells by a competitive mechanism.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5618-5623.
AB: Intestinal glucose uptake is mainly performed by the sodium-dependent glucose transporter, SGLT1. The transport activity of SGLT1 was markedly inhibited by green tea polyphenols, this inhibitory activity being most pronounced in polyphenols having galloyl residues such as epicatechin gallate (ECg) and epigallocatechin gallate (EGCg). Experiments using brush-border membrane vesicles obtained from the rabbit small intestine demonstrated that ECg inhibited SGLT1 in a competitive manner, although ECg itself was not transported via SGLT1. The present results suggest that tea polyphenols such as ECg interact with SGLT1 as antagonist-like molecules, possibly playing a role in controlling the dietary glucose uptake in the intestinal tract.

Record 71
AU: Nissen,-L.R.; Mansson,-L.; Bertelsen,-G.; Huynh-Ba,-T.; Skibsted,-L.H.
TI: Protection of dehydrated chicken meat by natural antioxidants as evaluated by electron spin resonance spectrometry.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5548-5556.
AB: Dehydrated chicken meat (a(w) = 0.20-0.35) made from mechanically deboned chicken necks can be protected against oxidative deterioration during storage by rosemary extract (at a sensory acceptable level of 1000 ppm, incorporated prior to drying). The efficiency of the rosemary extract was similar to that obtained by synthetic antioxidants in a reference product (70 ppm butylated hydroxyanisole and 70 ppm octyl gallate). Tea extract and coffee extract were less efficient than rosemary and synthetic antioxidants. Among the natural antioxidants tested, grape skin extract provided the least protection against oxidative changes in dehydrated chicken meat. Radicals in the product, quantified by direct measurement by electron spin resonance (ESR) spectrometry, developed similarly to headspace ethane, pentane, and hexanal, and to oxygen depletion both in unprotected and protected products. The ESR signal intensity and headspace hexanal both correlated with the sensory descriptor "rancidity" as evaluated by a trained sensory panel. Hexanal, as a secondary lipid oxidation product, showed an exponential dependence on the level of radicals in the product in agreement with a chain reaction mechanism for autoxidation, and direct ESR measurement may be used in quality control of dehydrated food products.

Record 72
AU: Wang,-D.; Yoshimura,-T.; Kubota,-K.; Kobayashi,-A.
TI: Analysis of glycosidically bound aroma precursors in tea leaves. 1. Qualitative and quantitative analyses of glycosides with aglycons as aroma compounds.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5411-5418.
AB: Twenty-six synthetic glycosides constituting aglycons of the main tea aroma compounds ((Z)-3-hexenol, benzyl alcohol, 2-phenylethanol, methyl salicylate, geraniol, linalool, and four isomers of linalool oxides) were synthesized in our laboratory as authentic compounds. Those compounds were used to carry out a direct qualitative and quantitative determination of the glycosides as aroma precursors in different tea cultivars by capillary gas chromatographic-mass spectrometric (GC-MS) analyses after trifluoroacetyl conversion of the tea

glycosidic fractions. Eleven beta-D-glucopyranosides, 10 beta-primeverosides (6-O-beta-D-xylopyranosyl-beta-D-glucopyranoside) with aglycons as the above alcohols, and geranyl beta-vicianoside (6-O-alpha-L-arabinopyranosyl-beta-D-glucopyranoside) were identified (tentatively identified in the case of methyl salicylate beta-primeveroside) in fresh tea leaves and quantified on the basis of calibration curves that had been established by using the synthetic compounds. Primeverosides were more abundant than glucosides in each cultivar we investigated for making green tea, oolong tea, and black tea. Separation of the diastereoisomers of linalool and four isomers of linalool oxides by GC analyses is also discussed.

Record 73
AU: Pascual-Teresa,-S.-de.; Santos-Buelga,-C.; Rivas-Gonzalo,-J.C.
TI: Quantitative analysis of flavan-3-ols in Spanish foodstuffs and beverages.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5331-5337.
AB: An HPLC method, using detection after postcolumn derivatization with p-dimethylaminocynnamaldehyde (DMACA), was developed for the quantitative analysis of individual flavanols in food. This method was applied to flavanol determination in 56 different kinds of Spanish food products, including fruit, vegetables, legumes, beverages (cider, coffee, beer, tea, and wine), and chocolate. The determined compounds corresponded to the catechins and proanthocyanidin dimers and trimers usually present in food and, therefore, they were representative of the flavanols of low degree of polymerization consumed with the diet. The data generated could be used for calculation of the dietary intake of either individual or total flavanols, which would allow the further establishment of epidemiological correlations with the incidence of chronic diseases. Similar flavanol profiles were found in the different samples of a similar type of product, even though important variations could exist in the concentrations of total and individual flavanols among them. This was attributed to factors such as sample origin, stage of ripeness, post-harvesting conservation, and processing. Total flavanol contents varied from nondetectable in most of the vegetables to 184 mg/100 g found in a sample of broad bean. Substantial amounts were also found in some fruits, such as plum and apple, as well as in tea and red wine. Epicatechin was the most abundant flavanol, followed by catechin and procyanidin B2. In general, catechins were found in all the flavanol-containing products, but the presence of gallocatechins was only relevant in pomegranate, broad bean, lentil, grape, wine, beer, and tea, and most of the berries. Galloyled flavanols were.
only detected in strawberry, medlar, grape, and tea.

Record 74
AU: Degenhardt,-A.; Engelhardt,-U.H.; Wendt,-A.S.; Winterhalter,-P.
TI: Isolation of black tea pigments using high-speed countercurrent chromatography and studies on properties of black tea polymers.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Nov 2000. v. 48 (11) p. 5200-5205.
AB: Isolation of theaflavins and epitheaflavic acids from black tea using high-speed countercurrent chromatography (HSCCC) on a preparative scale is demonstrated. HSCCC also enabled the isolation of a polymeric fraction from black tea. According to Roberts' classification, the polymeric fraction mainly consisted of SII thearubigins (TR). HPLC analysis showed that the isolated material is free of any known chromatographically resolved tea constituents and eluted from reversed-phase packings as a convex "hump" (a broad signal). The antioxidant activity of the TR fraction was 3.6 mmol of Trolox equivalents per gram. The total phenolic content of this fraction was determined to be 34.7 g/100 g (as gallic acid equivalents).

Record 75
AU: Yokozawa,-T.; Cho,-E.J.; Hara,-Y.; Kitani,-K.

TI: Antioxidative activity of green tea treated with radical initiator 2,2'-azobis(2-amidinopropane) dihydrochloride.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Oct 2000. v. 48 (10) p. 5068-5073.
AB: This study investigated the antioxidative activity of green tea extract, and a green tea tannin mixture and its components, under conditions of radical generation using the hydrophilic azo compound, 2,2'-azobis(2-amidinopropane) dihydrochloride (AAPH) to generate peroxyl radicals at a constant and measurable rate in the cultured renal epithelial cell line, LLC-PK1, which is susceptible to oxidative damage. Treatment with AAPH decreased cell viability and increased the formation of thiobarbituric acid-reactive substances. However, green tea extract, and the tannin mixture and its components, comprising (-)-epigallocatechin 3-O-gallate (EGCg), (-)-gallocatechin 3-O-gallate (GCg), (-)-epicatechin 3-O-gallate (ECg), (-)-epigallocatechin (EGC), (+)-gallocatechin (GC), (-)-epicatechin (EC), and (+)-catechin (C), showed protective activity against AAPH-induced cellular damage. The tannin mixture and its components exhibited higher antioxidative activity than the green tea extract. Furthermore, EGCg and GCg had higher activity than EGC and GC, respectively. In particular, EGCg exerted the most significant cellular protective activity against AAPH. These results indicate that green tea tannin may inhibit cellular loss and lipid peroxidation resulting from the peroxyl radical generated by AAPH, and that the chemical structure of tannin is also involved in the activity, suggesting that the O-dihydroxy structure in the B ring and the galloyl groups are important determinants for radical scavenging and antioxidative potential.

Record 76
AU: Yildirim,-A.; Mavi,-A.; Oktay,-M.; Kara,-A.A.; Algur,-O.F.; Bilaloglu,-V.
TI: Comparison of antioxidant and antimicrobial activities of tilia (Tilia argentea Desf ex DC), sage (Salvia triloba L.), and black tea (Camellia sinensis) extracts.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Oct 2000. v. 48 (10) p. 5030-5034.
AB: The antioxidant activity of the water extract of Tilia argentea Desf ex DC was determined by the thiocyanate method. The antioxidant activity of the water extract increased with the increasing amount of lyophilized extract (50-400 microgram) added into the linoleic acid emulsion. Statistically significant effect was determined in 100 microgram and higher amounts. Antioxidant activities of water extracts of tilia (Tilia argentea Desf ex DC), sage (Salvia triloba L.), and two Turkish black teas commercially called Rize tea and young shoot tea (Camellia sinensis) were compared. For comparison studies, 100 microgram portions of extracts were added into test samples. All samples were able to show statistically significant antioxidant effect. Both of the tea extracts showed highest antioxidant activities, nevertheless, differences between tilia and sage and tilia and tea were not statistically significant (for both cases $p > 0.05$). Like antioxidant activity, the reducing power of water extract of Tilia argentea Desf ex DC was also concentration dependent. Even in the presence of 50 microgram of extract, the reducing power was significantly higher than that of the control ($p < 0.05$) in which there was no extract. Unlike antioxidant activity, the highest reducing power activity was shown by sage extract. Among the tea extracts, young shoot extract was the most effective one, however, it had significantly lower activity than sage ($p < 0.05$). Although tea flower had the lowest reducing power activity, it was higher than that of tilia. But this difference was not statistically significant ($p > 0.05$). From these results, we could suggest that although the reducing power of a substance may be an.
indicator of its potential antioxidant activity, there may not always be a linear correlation between these two activities. In addition, antimicrobial activities of each of the above extracts were studied by disk diffusion methods on different test microorganisms. None of the extracts showed antibacterial activity on the studied microorganisms.

Record 77
AU: Gil,-M.I.; Tomas-Barberan,-A.; Hess-Pierce,-B.; Holcroft,-D.M.; Kader,-A.A.
TI: Antioxidant activity of pomegranate juice and its relationship with phenolic composition and processing.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Oct 2000. v. 48 (10) p. 4581-4589.
AB: The antioxidant activity of pomegranate juices was evaluated by four different methods (ABTS, DPPH, DMPD, and FRAP) and compared to those of red wine and a green tea infusion. Commercial pomegranate juices showed an antioxidant activity (18-20 TEAC) three times higher than those of red wine and green tea (6-8 TEAC). The activity was higher in commercial juices extracted from whole pomegranates than in experimental juices obtained from the arils only (12-14 TEAC). HPLC-DAD and HPLC-MS analyses of the juices revealed that commercial juices contained the pomegranate tannin punicalagin (1500-1900 mg/L) while only traces of this compound were detected in the experimental juice obtained from arils in the laboratory. This shows that pomegranate industrial processing extracts some of the hydrolyzable tannins present in the fruit rind. This could account for the higher antioxidant activity of commercial juices compared to the experimental ones. In addition, anthocyanins, ellagic acid derivatives, and hydrolyzable tannins were detected and quantified in the pomegranate juices.

Record 78
AU: Matsingou,-T.C.; Kapsokefalou,-M.; Salifoglou,-A.
TI: In vitro antioxidant activity of black tea and Mediterranean herb infusions toward iron under simulated gastrointestinal conditions.
SO: J-food-sci. Chicago, Ill. : Institute of Food Technologists. Sept 2000. v. 65 (6) p. 1060-1065.
AB: Dietary components, such as polyphenols, may be capable of scavenging reactive oxygen species implicated in biological damage. In order to understand their significance in disease prevention, the behavior of systems harboring antioxidants and prooxidants was investigated. Various Mediterranean herbs and black-tea infusions were investigated in vitro, in the presence of iron, under simulated gastrointestinal conditions. All infusions exhibited variable antioxidant activity relative to the controls in the absence or presence of digestive enzymes and bile salts. Correlations of antioxidant activity with iron and polyphenols in dialysates were performed. The results of the in vitro assay demonstrate that it can offer more details on potential antioxidants relative to other model systems.

Record 79
AU: Wang,-L.F.; Kim,-D.M.; Lee,-C.Y.
TI: Effects of heat processing and storage on flavanols and sensory qualities of green tea beverage.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Sept 2000. v. 48 (9) p. 4227-4232.
AB: This research was conducted to understand the effects of heat processing and storage on flavanols and sensory qualities of green tea extract. Fresh tea leaves were processed into steamed and roasted green teas by commercial methods and then extracted with hot water (80 degrees C) at 1:160 ratio (tea leaves/water by weight). Green tea extracts were heat processed at 121 degrees C for 1 min and then stored at 50 degrees C to accelerate chemical reactions. Changes in flavanol composition and sensory qualities of green tea extracts during processing and storage were measured. Eight major flavanols (catechin, epicatechin, gallocatechin, epigallocatechin, epicatechin gallate, catechin gallate, epigallocatechin gallate, and gallocatechin gallate) were identified in the processed tea extract. Among them, epigallocatechin gallate and epigallocatechin appeared to play the key role in the changes of sensory qualities of processed green tea beverage. The steamed tea leaves produced a more desirable quality of processed green tea beverage than the roasted ones.

Record 80

AU: Kida,-K.; Suzuki,-M.; Matsumoto,-N.; Nanjo,-F.; Hara,-Y.
TI: Identification of biliary metabolites of (-)-epigallocatechin gallate in rats.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Sept 2000. v. 48 (9) p. 4151-4155.
AB: After oral administration of (-)-epigallocatechin gallate (EGCg) to rats, its biliary metabolites were examined. Although a large part of the biliary metabolites was found to exist in conjugated forms, it was difficult to separate the conjugated forms. Thus the free form of biliary metabolites was prepared by beta-glucuronidase/sulfatase treatment and was purified by HPLC. Six compounds purified were subjected to FAB-MS and NMR analyses. The six metabolites thus obtained were shown to be EGCg, 3'-O-methyl-EGCg, 4'-O-methyl-EGCg, 3"-O-methyl-EGCg, 4"-O-methyl-EGCg, and 4',4"-di-O-methyl-EGCg, respectively. The six EGCg metabolites and their conjugates excreted during a 4-h period were estimated to be roughly 0.1% and 3.3% of the administrated EGCg, respectively. In addition, 4"-O-methyl-EGCg and 4', 4" -di-O-methyl-EGCg were estimated to exist only in the sulfate form, but the other four metabolites existed in both glucuronide (and/or sulfoglucuronide) and sulfate forms.

Record 81
AU: Baker,-G.R.; Lowe,-R.F.; Southwell,-I.A.
TI: Comparison of oil recovered from tea tree leaf by ethanol extraction and steam distillation.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Sept 2000. v. 48 (9) p. 4041-4043.
AB: Two methods for the determination of oil and oil major components from tea tree (Melaleuca alternifolia) leaf are quantitatively compared. A microwave assisted ethanol extraction and a 2-h hydrodistillation technique were used on both dry and fresh leaf from a low and a high oil concentration tree. There was no significant difference between dry and fresh leaf. The distillation technique recovered 88% and 82% of the extractable oil for the low and high concentration material, respectively. For both samples this distilled oil was composed of lower absolute amounts of sesquiterpenoids and marginally lower amounts of monoterpenoids. Extending the distillation to 6 h increased the sesquiterpenoid recovery but this resulted in a reduction in both the absolute and relative amounts of the oxygenated monoterpenoids, terpinen-4-ol and 1,8-cineole.

Record 82
AU: Toschi,-T.G.; Bordoni,-A.; Hrelia,-S.; Bendini,-A.; Lercker,-G.; Biagi,-P.L.
TI: The protective role of different green tea extracts after oxidative damage is related to their catechin composition.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Sept 2000. v. 48 (9) p. 3973-3978.
AB: The antioxidant activities of three different green tea extracts were investigated and compared by two different methods. By the first method, which evaluated the direct protective effect of the green tea extracts on lipid peroxidation, the extracts were added, at different concentrations, to a lipid model system, made by refined peanut oil, freshly submitted to a further bleaching and subjected to forced oxidation at 98 degrees C, by an oxidative stability instrument. By the second method, the effectiveness of the same extracts was checked in cultures of neonatal rat cardiomyocytes exposed to a free radical-generating system by evaluating conjugated diene production and lactate dehydrogenase release. All of the extracts revealed a strong antioxidant activity by both the methods, and a particular effectiveness was demonstrated by the extracts having higher amounts of (-)-epigallocathechin-3-gallate and (-)-epigallocathechin, as analyzed by reverse-phase HPLC analysis.

Record 83
AU: He,-P.; Wada,-S.; Watanabe,-N.; Sugiyama,-K.
TI: Liver injury-preventive effect of tea theanine in rats.

SO: J-food-sci. Chicago, Ill. : Institute of Food Technologists. Jan/Feb 2000. v. 65 (1) p. 30-33.
AB: This study was conducted to isolate the constituent, which had a preventive effect on D-galactosamine-induced rat liver injury, from the 70% ethanol-soluble fraction of Japanese green tea. Theanine (glutamic acid gamma-ethylamide) was identified as the active compound, and the liver injury-preventive effect of theanine was dose-dependent. L-Glutamic acid gamma-ethyl ester, but not glutamine, also brought about a significantly preventive effect on liver injury when added to the diet at equimolar levels to that of 1% theanine. The results indicate that theanine is one of the effective constituents of Japanese green tea in preventing D-galactosamine-induced liver injury.

Record 84
AU: Broadhurst,-C.L.; Polansky,-M.M.; Anderson,-R.A.
TI: Insulin-like biological activity of culinary and medicinal plant aqueous extracts in vitro.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Mar 2000. v. 48 (3) p. 849-852.
AB: To evaluate the possible effects on insulin function, 49 herb, spice, and medicinal plant extracts were tested in the insulin-dependent utilization of glucose using a rat epididymal adipocyte assay. Cinnamon was the most bioactive product followed by witch hazel, green and black teas, allspice, bay leaves, nutmeg, cloves, mushrooms, and brewer's yeast. The glucose oxidation enhancing bioactivity was lost from cinnamon, tea, witch hazel, cloves, bay leaf and allspice by poly-(vinylpyrrolidone) (PVP) treatment, indicating that the active phytochemicals are likely to be phenolic in nature. The activity of sage, mushrooms, and brewers's yeast was not removed by PVP. Some products such as Korean ginseng, flaxseed meal, and basil have been reported to be effective antidiabetic agents; however, they were only marginally active in our assay. Our technique measures direct stimulation of cellular glucose metabolism, so it may be that the active phytochemicals in these plants improve glucose metabolism via other mechanisms or that this in vitro screening is not a reliable predictor of hypoglycemic effects in vivo for some products. In summary, the positive effects of specific plant extracts on insulin activity suggest a possible role of these plants in improving glucose and insulin metabolism.

Record 85
AU: Merken,-H.M.; Beecher,-G.R.
TI: Measurement of food flavonoids by high-performance liquid chromatography: a review.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Mar 2000. v. 48 (3) p. 577-599.
AB: The flavonoids are plant polyphenols found frequently in fruits, vegetables, and grains. Divided into several subclasses, they include the anthocyanidins, pigments chiefly responsible for the red and blue colors in fruits, fruit juices, wines, and flowers; the catechins, concentrated in tea; the flavanones and flavanone glycosides, found in citrus and honey; and the flavones, flavonols, and flavonol glycosides, found in tea, fruits, vegetables, and honey. Known for their hydrogen-donating antioxidant activity as well as their ability to complex divalent transition metal cations, flavonoids are propitious to human health. Computer-controlled high-performance liquid chromatography (HPLC) has become the analytical method of choice. Many systems have been developed for the detection and quantification of flavonoids across one, two, or three subclasses. A summary of the various HPLC and sample preparation methods that have been employed to quantify individual flavonoids within a subclass or across several subclasses are tabulated in this review.

Record 86
AU: Gong,-Y.; Han,-C.; Chen,-J.
TI: Effect of tea polyphenols and tea pigments on the inhibition of precancerous liver lesions in rats.

SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 38 (1) p. 81-86.
AB: The objective of this study was to investigate the inhibitory effect of tea components, tea polyphenols and tea pigments, on precancerous liver lesions in rats. A rat liver precancerous lesion model was established by multiple low-dosage N-nitrosodiethylamine (NDEA) injections, followed by intraperitoneal CCl4 injection and partial hepatectomy (PH). Tea pigments (0.1%) or tea polyphenols (0.1%) were given to Wistar rats in drinking water during the eight weeks of the experiment. The number and area of glutathione S-transferase Pi-positive foci in the rat liver were used as biomarkers of precancerous liver lesions. Western and Northern blot techniques were used to detect rat liver GST-Pi expression at the protein and mRNA levels. At the end of the experiment, tea polyphenols and tea pigments significantly decreased the number and area of GST-Pi-positive foci that were overexpressed in the NDEA-CCl4-PH-treated rats compared with the positive control group. The results also showed that GST-Pi mRNA and protein expression increased significantly in the NDEA-CCl4-PH-treated group, which is consistent with the changing of GST-Pi-positive foci. Tea pigments and tea polyphenols had an inhibitory effect on the overexpression of GST-Pi mRNA and protein in NDEA-CCl4-PH-treated rats. These results suggest that tea pigments and tea polyphenols are effective in preventing the occurrence and progression of precancerous liver lesions in rats.

Record 87
AU: Metz,-N.; Lobstein,-A.; Schneider,-Y.; Gosse,-F.; Schleiffer,-R.; Anton,-R.; Raul,-F.
TI: Suppression of azoxymethane-induced preneoplastic lesions and inhibition of cyclooxygenase-2 activity in the colonic mucosa of rats drinking a crude green tea extract.
SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 38 (1) p. 60-64.
AB: We determined the effects of a crude green tea extract given as drinking fluid on the promotion/progression phase of colon carcinogenesis in rats after induction of the neoplastic process by azoxymethane. Adult Wistar rats were given azoxymethane (15 mg/kg ip) once a week for two weeks. One week after the second injection, the rats were randomly divided into two groups. One group (n = 8) received daily prepared aqueous solutions of green tea extracts (GTE; 0.02%, wt/vol); the control group (n = 8) received tap water. After six weeks, rats receiving GTE showed a 60% reduction in the number of colonic preneoplastic lesions (aberrant crypts). The number of individual crypts per aberrant crypt focus (crypt multiplicity) was significantly reduced in the GTE group; the majority (80%) of the remaining aberrant foci contained only one or two preneoplastic crypts. A significant and selective decrease of cyclooxygenase (COX)-2 activity was observed in the colon of rats receiving GTE (23 +/- 3 vs. 117 +/- 30 mU/mg protein in controls), whereas COX-1 showed no alterations. Our data demonstrate that GTE reduces COX-2 and suppresses the formation of colonic preneoplastic lesions. They provide new insights into the mechanism of chemopreventive and anti-inflammatory properties of green tea.

Record 88
AU: Drewnowski,-A.; Gomez-Carneros,-C.
TI: Bitter taste, phytonutrients, and the consumer: a review.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. Dec 2000. v. 72 (6) p. 1424-1435.
AB: Dietary phytonutrients found in vegetables and fruit appear to lower the risk of cancer and cardiovascular disease. Studies on the mechanisms of chemoprotection have focused on the biological activity of plant-based phenols and polyphenols, flavonoids, isoflavones, terpenes, and glucosinolates. Enhancing the phytonutrient content of plant foods through selective breeding or genetic improvement is a potent dietary option for disease prevention. However, most, if not all, of these bioactive compounds are bitter, acrid, or astringent and therefore aversive to the consumer. Some have long been viewed as plant-

based toxins. As a result, the food industry routinely removes these compounds from plant foods through selective breeding and a variety of debittering processes. This poses a dilemma for the designers of functional foods because increasing the content of bitter phytonutrients for health may be wholly incompatible with consumer acceptance. Studies on phytonutrients and health ought to take sensory factors and food preferences into account.

Record 89
AU: Hodgson,-J.M.
TI: Tea and cardiovascular disease: a review.
SO: Proc-nutr-soc-Aus. South Bentley, W.Australia. Society. 2000. v. 24 p. 241-249.

Record 90
AU: Wang,-H.; Provan,-G.J.; Helliwell,-K.
TI: Tea flavonoids: their functions, utilisation and analysis.
SO: Trends-food-sci-technol. Kidlington, Oxford, UK : Elsevier Science Ltd. Apr/May 2000. v. 11 (4/5) p. 152-160.

Record 91
AU: Cronin,-K.; Preis,-C.
TI: A statistical analysis of biscuit physical properties as affected by baking.
SO: J-food-eng. Oxford : Elsevier Science Ltd. Dec 2000. v. 46 (4) p. 217-225.
AB: The variability in the dimensions, weight and moisture content of commercial and laboratory Rich Tea type biscuits has been quantified. An experimental study has been conducted comparing dispersion in dough piece weight and thickness to that of the resulting biscuits. The sensitivity of these biscuit properties to deviations in the baking process and in dough ingredient levels has been investigated. It was found that the dispersion in biscuit weight is primarily due to variability in dough piece weight, which in turn is linked to spatial variations in the thickness of the dough sheet from which the pieces are cut. The baking stage can slightly diminish the distribution in weight by reducing the variability in moisture content between biscuits. The mechanism by which this happens is that wetter dough pieces dry proportionally more than those with lower moisture levels. Biscuit moisture content is sensitive to fluctuations in oven temperature and dough piece moisture content though at a level that may not be commercially significant.

Record 92
AU: Dulloo,-A.G.; Seydoux,-J.; Girardier,-L.; Chantre,-P.; Vandermander,-J.
TI: Green tea and thermogenesis: interactions between catechin-polyphenols, caffeine and sympathetic activity.
SO: Int-j-obes-relat-metab-disord. Avenel, NJ : Nature Publishing Company. Feb 2000. v. 24 (2) p. 252-258.
AB: The thermogenic effect of tea is generally attributed to its caffeine content. We report here that a green tea extract stimulates brown adipose tissue thermogenesis to an extent which is much greater than can be attributed to its caffeine content per se, and that its thermogenic properties could reside primarily in an interaction between its high content in catechin-polyphenols and caffeine with sympathetically released noradrenaline (NA). Since catechin-polyphenols are known to be capable of inhibiting catechol-O-methyl-transferase (the enzyme that degrades NA), and caffeine to inhibit trancellular phosphodiesterases (enzymes that break down NA-induced cAMP), it is proposed that the green tea extract, via its catechin-polyphenols and caffeine, is effective in stimulating thermogenesis by relieving inhibition at different control points along the NA-cAMP axis. Such a synergistic interaction between catechin-polyphenols and caffeine to augment and prolong sympathetic stimulation of thermogenesis could be of value in assisting the management of obesity.

Record 93

AU: Stickel,-F.; Seitz,-H.K.
TI: The efficacy and safety of comfrey.
SO: Public-health-nutr. Wallingford, Oxon, UK : CABI Publishing on behalf of The Nutrition Society. Dec 2000. v. 3 (4A) p. 501-508.

Record 94
AU: Yau,-N.J.N.; Huang,-Y.J.
TI: The effect of membrane-processed water on sensory properties of Oolong tea drinks.
SO: Food-qual-prefer. Oxford, U.K. : Elsevier Science Limited. July 2000. v. 11 (4) p. 331-339.
AB: Three types of water, unprocessed water and two membrane-processed water, were employed to produce Oolong tea-drink samples. A commercial sample of Oolong tea-drinks using the same materials was also included for testing. A modified quantitative descriptive analysis was conducted on a line scale by 15 trained panelists and a hedonic test was conducted by 50 naive panelists. There were significant treatment effects on 13 out of 19 sensory descriptive attributes. The commercial sample was higher in red-brown color and alkaline-flavor, but lower in yellow-brown color, oolong-tea aroma, astringency, bitterness, Oolong-tea flavor, fermented-tea flavor, and astringent aftertaste. There were also membrane effects on color, aromas, and flavors of tea drinks. The most interesting phenomenon was that the unprocessed sample was found to be the lowest in the intensity of clearness by trained panelists. This implied that membrane process could improve the clearness of similar tea drinks. It was also found that 12 attributes, which could separate unprocessed, commercial and membrane-processed samples well, were important to the sensory properties of unsweetened Oolong tea drinks in principal component analysis. Concerning the preference test, the naive panelists liked the unprocessed sample the least. It seemed that this was affected by the appearance (low clearness) of the unprocessed sample.

Record 95
AU: Brown,-W.E.; Braxton,-D.
TI: Dynamics of food breakdown during eating in relation to perceptions of texture and preference: a study on biscuits.
SO: Food-qual-prefer. Oxford, U.K. : Elsevier Science Limited. July 2000. v. 11 (4) p. 259-267.
AB: Combined recording of masticatory muscle activity and jaw movement patterns during eating was used to examine the process of food breakdown in the mouth for a series of "Rich Tea"-type biscuits in 19 ordinary consumers. These data indicated an initial increase in chewing work from the masticatory muscles over the first 5-10 chews followed by a decline over the remainder of the chewing sequence. The work was concentrated in vertical closing of the jaw during the early chews but as this declined over the later chews there was an increase in the amount of work occurring with the teeth in near occlusion. The relative amount of work input into the chewing sequence, the duration of the sequence, and the degree of work undertaken at occlusion, differed among groups of the consumers who were classified according to their chewing efficiency (CE). Subjects from different CE groups appeared to have different understandings of the textural characteristics of the samples which they assessed as "hardness", "crunchiness" and "crumbliness". Differences in the oral breakdown patterns for different CE groups may provide an understanding of differences in consumer preferences for the samples.

Record 96
AU: Kostyuk,-V.A.; Potapovich,-A.I.; Vladykovskaya,-E.N.; Hiramatsu,-M.
TI: Protective effects of green tea catechins against asbestos-induced cell injury.
SO: Planta-med. Stuttgart : Georg Thieme Verlag,. Dec 2000. v. 66 (8) p. 762-764.

Record 97
AU: Beatty,-E.R.; O'Reilly,-J.D.; England,-T.G.; McAnlis,-G.T.; Young,-I.S.; Halliwell,-B.; Geissler,-C.A.; Sanders,-T.A.B.; Wiseman,-H.
TI: Effect of dietary quercetin on oxidative DNA damage in healthy human subjects.
SO: Br-j-nutr. London, U.K. : CAB International. Dec 2000. v. 84 (6) p. 919-925.
AB: The effect of dietary intake of flavonols (predominantly quercetin) on oxidative DNA damage was studied in thirty-six healthy human subjects (sixteen men, twenty women). The study was a randomised crossover study, comprising two 14 d treatments of either a low-flavonol (LF) or high-flavonol (HF) diet with a 14 d wash-out period between treatments. Subjects were asked to avoid foods containing flavonols, flavones and flavanols during the LF dietary treatment period and to consume one 150 g onion (Allium cepa) cake (containing 89.7 mg quercetin) and one 300 ml cup of black tea (containing 1.4 mg quercetin) daily during the HF dietary treatment. A 7 d food diary was kept during each dietary period and blood samples were taken after each dietary treatment. Products of oxidative damage to DNA bases were measured in DNA from leucocytes. The study had more than 95% power to detect a change of 20% in DNA damage products ($P < 0.05$). Plasma vitamin C and plasma quercetin concentrations were also measured. No significant differences in intake of macronutrients or assessed micronutrients, measured DNA base damage products, or plasma vitamin C were found between the HF and LF dietary treatments. The plasma quercetin concentration was significantly higher after the HF dietary treatment period (228.5 (SEM 34.7) nmol/l) than after the LF dietary treatment period (less than the limit of detection, i.e. < 66.2 nmol/l). These findings do not support the hypothesis that dietary quercetin intake substantially affects oxidative DNA damage in leucocytes.

Record 98
AU: Hurrell,-R.F.; Reddy,-M.B.; Burri,-J.; Cook,-J.D.
TI: An evaluation of EDTA compounds for iron fortification of cereal-based foods.
SO: Br-j-nutr. London, U.K. : CAB International. Dec 2000. v. 84 (6) p. 903-910.
AB: Fe absorption was measured in adult human subjects consuming different cereal foods fortified with radiolabelled FeSO4, ferrous fumarate or NaFeEDTA, or with radiolabelled FeSO4 or ferric pyrophosphate in combination with different concentrations of Na2EDTA. Mean Fe absorption from wheat, wheat-soyabean and quinoa (Chenopodium quinoa) infant cereals fortified with FeSO4 or ferrous fumarate ranged from 0.6 to 2.2%. For each infant cereal, mean Fe absorption from ferrous fumarate was similar to that from FeSO4 (absorption ratio 0.91-1.28). Mean Fe absorption from FeSO4-fortified bread rolls was 1.0% when made from high-extraction wheat flour and 5.7% when made from low-extraction wheat flour. Fe absorption from infant cereals and bread rolls fortified with NaFeEDTA was 1.9-3.9 times greater than when the same product was fortified with FeSO4. Both high phytate content and consumption of tea decreased Fe absorption from the NaFeEDTA-fortified rolls. When Na2EDTA up to a 1:1 molar ratio (EDTA:Fe) was added to FeSO4-fortified wheat cereal and wheat-soyabean cereal(.)mean Fe absorption from the wheat cereal increased from 1.0% to a maximum of 5.7% at a molar ratio of 0.67:1, and from the wheat-soyabean cereal from 0.7% to a maximum of 2.9% at a molar ratio of 1:1. Adding Na2EDTA to ferric pyrophosphate-fortified wheat cereal did not significantly increase absorption ($P > 0.05$). We conclude that Fe absorption is higher from cereal foods fortified with NaFeEDTA than when fortified with FeSO4 or ferrous fumarate, and that Na2EDTA can be added to cereal foods to enhance absorption of soluble Fe-fortification compounds such as FeSO4.

Record 99
AU: Kessler,-T.; Hesse,-A.

TI: Cross-over study of the influence of bicarbonate-rich mineral water on urinary composition in comparison with sodium potassium citrate in healthy male subjects.
SO: Br-j-nutr. London, U.K. : CAB International. Dec 2000. v. 84 (6) p. 865-871.
AB: Urine volume is the greatest risk factor for nephrolithiasis. High fluid intake is the first general advice given to stone-forming patients for the prevention of their recurrence. The aim of the present study was to evaluate the influence of bicarbonate-rich mineral water (1715 mg bicarbonate/l) on urinary-stone risk factors in comparison with sodium potassium citrate, a well-established treatment for urinary stones. The mineral water and sodium potassium citrate were administered in equimolar concentrations, with respect to the alkali load. All investigations were carried out in healthy male subjects aged 23-38 years. The study followed a cross-over design. All subjects received a standardized diet during the cross-over phase, which was formulated according to the dietary recommendations of the German Society of Nutrition (Deutsche Gesellschaft fur Ernahrung, 1996). On the loading day of the cross-over phase, fruit tea was substituted for either mineral water or sodium potassium citrate dissolved in fruit tea. The treatment offered during the second part of the cross-over phase was continued for a 4-week follow-up under normal dietary conditions. During the cross-over phase, there was a significant increase in urinary pH ($P < 0.001$). There was also a significant increase in the excretion of citric acid ($P < 0.01$), a decrease in the excretion of oxalic acid, and therefore a decrease in the relative supersaturations for calcium oxalate and uric acid. In the follow-up phase also, the relative supersaturations decreased and there were beneficial effects on the other urinary variables. The effect of the bicarbonate-rich mineral water was similar to that of the sodium potassium citrate, which suggests that it.
could be useful in the prevention of the recurrence of calcium oxalate and uric acid stones.

Record 100
AU: Chen,-C.; Liu,-B.Y.
TI: Changes in major components of tea fungus metabolites during prolonged fermentation.
SO: J-appl-microbiol. Oxford, U.K. : Blackwell Science Ltd. Nov 2000. v. 89 (5) p. 834-839.
AB: Changes in major components and microbes in tea fungus broth (or kombucha; teakwass) prepared from nine different sources during a prolonged fermentation of up to 60 days were investigated. Cell concentrations of both yeasts and acetic acid bacteria in broth were generally higher than those in the cellulosic pellicles. The residual sucrose concentration decreased linearly with time, although the rate fell after the first month. Metabolic fates of glucose and fructose produced as a result of the hydrolysis of sucrose were different. Glucose was not produced in parallel with fructose (0.085 g 100 ml-1 d-1) but was produced with a lower initial rate (0.041 g 100 ml-1 d-1). Both titratable acidity and gluconic acid increased steadily with time for all samples, although gluconic acid was not generated for 6 days until the fermentation had begun. Acetic acid increased slowly to a maximum value of 1.1 g 100 ml-1 after 30 days; thereafter, it decreased gradually. Gluconic acid contributed to the titratable acidity and thus, the taste of tea fungus broth, during the final stage of fermentation. It is concluded that the desired quality or composition of kombucha can be obtained through the proper control of fermentation time.

Record 101
AU: Schut,-H.A.J.; Yao,-R.
TI: Tea as a potential chemopreventive agent in PhIP carcinogenesis: effects of green tea and black tea on PhIP-DNA adduct formation in female F-344 rats.
SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 36 (1) p. 52-58.

Record 102
AU: Kim,-S.; Lee,-M.J.; Hong,-J.; Li,-C.; Smith,-T.J.; Yang,-G.Y.; Seril,-D.N.; Yang,-C.S.
TI: Plasma and tissue levels of tea catechins in rats and mice during chronic consumption of green tea polyphenols.
SO: Nutr-cancer. Mahwah, N.J. : Lawrence Erlbaum Associates, Inc. 2000. v. 37 (1) p. 41-48.

Record 103
AU: Heath,-A.L.M.; Skeaff,-C.M.; Gibson,-R.S.
TI: The relative validity of a computerized food frequency questionnaire for estimating intake of dietary iron and its absorption modifiers.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. July 2000. v. 54 (7) p. 592-599.
AB: Objective: To determine the relative validity of an iron food frequency questionnaire (iron FFQ) designed to assess intakes of dietary iron and its absorption modifiers. Design: A computer-administered food frequency questionnaire was designed to estimate intake of total, non-haem, haem and meat iron as well as dietary components which influence iron absorption (vitamin C, phytate, calcium, grammes of meat/fish/poultry, tea and coffee) in women consuming a Western diet. The relative validity of the iron FFQ was assessed by comparing its results with those from weighed diet records collected over 11 days. Setting: Dunedin, New Zealand. Participants: Forty-nine women aged 19-31 y attending the University of Otago. Results: There was good agreement between the iron FFQ and the weighed diet records for median intakes of total iron, non-haem iron, calcium, tea and coffee. For dietary component intakes, correlations between the two methods ranged from 0.39 (for vitamin C) to 0.87 (for coffee) with 0.52 for total iron, and 0.61 for haem iron. In cross-classification with the weighed diet record, the iron FFQ correctly classified between 22% (for vitamin C) and 51% (for phytate) of participants into the same quartile. Actual values for surrogate categories indicated that the questionnaire can clearly differentiate between low and high intakes of all the dietary components assessed. The questionnaire also showed an acceptable level of agreement between repeat administrations (eg a correlation for total iron of 0.65). Conclusions: The iron FFQ is appropriate for assessing group intakes of total iron, and iron absorption modifiers, in population studies to assess the aetiology and treatment of iron deficiency states.
in adult women consuming a Western diet.

Record 104
AU: Vinoy,-S.; Rosetta,-L.; Mascie-Taylor,-C.G.N.
TI: Repeated measurements of energy intake, energy expenditure and energy balance in lactating Bangladeshi mothers.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. July 2000. v. 54 (7) p. 579-585.
AB: Objective: To examine changes in energetic parameters and nutritional status of chronically malnourished lactating women over a period of 13 months postpartum. Design: A study of 15 lactating Bangladeshi mothers, of whom eight were tea pluckers and seven housewives, was conducted over a 13 months period from the birth of the child. Anthropometric measurements and body composition were determined on five occasions (at 3.5, 5.5, 7.5, 10 and 13 months) and energy expenditure (heart rate monitoring method), and energy intake (3-day weighing) on three occasions at 3.5, 10 and 13 months. Results: The mothers, all of whom were of low BMI (range 14.9-18.1 kg/m2) at the end of the study) undertook high levels of physical activity (pluckers more so than housewives). There was evidence of weight loss over the 13 months, particularly between the fourth and sixth months postpartum, mainly due to a significant decrease in fat-free mass. Food intake and expenditure were higher in pluckers than housewives but energy balance was not significantly different, although workers were, on average, in negative balance on all three occasions. Food intake was based on cereals and fat deficient. Conclusions: A Bangladeshi sample of breast-feeding

mothers studied over 13 months postpartum showed evidence of chronic malnutrition with women living on very low fat diets. All mothers, either housewives or tea pluckers were involved in energy demanding activities. There was a general tendency towards negative energy balance. Mothers lost weight, mainly fat-free mass over the study period.

Record 105
AU: Taylor,-C.A.; Hampl,-J.S.; Johnston,-C.S.
TI: Low intakes of vegetables and fruits, especially citrus fruits, lead to inadequate vitamin C intakes among adults.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. July 2000. v. 54 (7) p. 573-578.
AB: Objective: To determine vitamin C intakes among adults and to identify differences in dietary intake associated with vitamin C consumption. Design: This cross-sectional study compared vitamin C intake, nutrient intake, and food group choices of adults with low (< 30 mg/d), marginal (30-60 mg/d), and desirable (> 60 mg/d) vitamin C intakes. Subjects: Data from 2472 men and 2334 women aged 25-75 y were obtained from the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII). Results: Overall, 18% of the sample had low vitamin C intakes, 24% had marginal intakes, and 58% had desirable intakes. In addition to consuming less vitamin C, adults with low vitamin C intakes consumed significantly less (P less than or equal to 0.001) energy-adjusted (ie nutrient/1000 kcal) folate, fiber, beta-carotene, and vitamin B6, and significantly more (P < 0.001) fat. Compared to adults with low intakes, adults with desirable vitamin C intakes consumed significantly more (P less than or equal to 0.001) high-vitamin C fruit juice and low-vitamin C vegetables, while consuming significantly less (P less than or equal to 0.009) soft drinks, coffee/tea and alcoholic beverages. On average, adults with desirable vitamin C intakes consumed more than five daily servings of vegetables and fruits, of which more than one was citrus. Adults with low and marginal vitamin C intakes consumed less than one-fifth of a serving of citrus. Conclusions: A considerable number of adults under-consume vitamin C and total vegetables and fruits. Nutritionists should continue to promote five to nine daily servings of vegetables and fruits, at least one of which should be rich in vitamin C.

Record 106
AU: Sung,-H.; Nah,-J.; Chun,-S.; Park,-H.; Yang,-S.E.; Min,-W.K.
TI: In vivo antioxidant effect of green tea.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. July 2000. v. 54 (7) p. 527-529.
AB: Objective: The object of this study was to investigate the in vivo antioxidant effect of green tea and dosage effect of green tea on antioxidant effect. Design: We tested 10 healthy subjects (aged 23-25 y, five women and five men) with overnight fasting. The total antioxidant capacity of plasma was measured at baseline and 60 min and 120 min after ingestion of 150 ml green tea. Green tea was prepared by infusing 2.5 g of dried green tea leaves for 2 min at 80 degrees C in 150 ml of water. In the second week, they took 300 ml of tea (5.0 g of green tea leaves) and, in the third week, 450 ml of tea (7.5 g of green tea leaves). The total antioxidant capacities of plasma were determined with a Total Antioxidant Kit (Randox Laboratories Ltd, UK) using a Cobas Mira analyser (Roche Diagnostic Systems Inc., Switzerland). The mean intra-assay coefficient of variation was 1.2%. Results: The total antioxidant capacity of plasma increased by 1.1% at 60 min and 2.1% at 120 min over baseline value in subjects consuming 150 ml of green tea, which was statistically not significant. However, total antioxidant capacity of plasma after consuming 300 ml of green tea showed a significant increase of 7.0% after 60 min and 6.2% after 120 min (P < 0.0001), and after consuming 450 ml 12.0% after 60 min and 12.7% after 120 min over baseline value (P < 0.0001). Conclusions: Total antioxidant capacity of plasma was significantly increased after taking green tea in amounts of 300 and 450 ml. A positive increment according to green tea dosage was also observed.

Record 107
AU: Lowe,-R.; Murtagh,-J.; Morris,-S.
TI: Salt tolerance of tea tree (Melaleuca alternifolia).
SO: Aust-for. Yarralumla ACT, Australia : Institute of Foresters of Australia. Dec 2000. v. 63 (4) p. 252-256.

Record 108
AU: Balasuriya,-J.
TI: The partitioning of net total dry matter to roots of clonal tea (Camellia sinensis) at different altitudes in the wet zone of Sri Lanka.
SO: Trop-agric. St. Augustine, Trinidad : The University of the West Indies Press. July 2000. v. 77 (3) p. 163-168.

Record 109
AU: Owuor,-P.O.; Ng'etich,-W.K.; Obanda,-M.
TI: Quality response of clonal black tea to nitrogen fertiliser, plucking interval and plucking standard.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Mar 2000. v. 80 (4) p. 439-446.
AB: Variations in the black tea quality of high-yielding clone S15/10 in response to rates of NPKS 25:5:5:5 fertiliser of 200 and 400 kg N ha-1 year-1, plucking intervals of 7, 14 and 21 days and a selective plucking standard of up to two leaves and a bud or an unselective plucking standard were studied. Generally, quality declined with longer plucking intervals and unselective plucking. Although there was a general decline in quality with increasing nitrogen rate, only the black tea total colour declined significantly on increasing the nitrogen rate from 200 to 400 kg N ha-1 year-1. For each nitrogen rate and each plucking interval, unselective plucking reduced the black tea quality. No significant interactions between any two of the three (nitrogen rate, plucking interval and plucking standard) or all three factors were noted, indicating that the patterns of response were similar. The results demonstrate that black tea quality changes due to the factors studied occur in the same pattern with variations in treatments. Poor black tea quality due to any of the factors studied cannot therefore be corrected by varying the other factors.

Record 110
AU: Paknawin-Mock,-J.; Jarvis,-L.; Jahari,-A.B.; Husaini,-M.A.; Pollitt,-E.
TI: Community-level determinants of child growth in an Indonesia tea plantation.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. May 2000. v. 54 (suppl.2) p. S28-S42.

Record 111
AU: Kang,-J.H.; Chung,-S.T.; Go,-J.H.; Row,-K.H.
TI: Separation of epigallocatechin gallate from Korean green tea by RP-HPLC.
SO: J-liq-chromatogr-relat-technol. Monticello, NY : Marcel Dekker, Inc. 2000. v. 23 (17) p. 2739-3749.

Record 112
AU: Temple,-S.J.; Boxtel,-A.J.B.-van.
TI: Control of fluid bed tea dryers: controller design and tuning.
SO: Comput-electron-agric. Amsterdam : Elsevier, 1985-. Apr 2000. v. 26 (2) p. 159-170.

Record 113
AU: Watt,-R.G.; Dykes,-J.; Sheiham,-A.
TI: Drink consumption in British preschool children: relation to vitamin C, iron and calcium intakes.
SO: J-hum-nutr-diet. Oxford : Blackwell Science Ltd. Feb 2000. v. 13 (1) p. 13-19.

Record 114
AU: Tortorello,-M.L.; Reineke,-K.F.
TI: Direct enumeration of Escherichia coli and enteric bacteria in water, beverages and sprouts by 16S rRNA in situ hybridization.
SO: Food-microbiol. London ; Orlando : Academic Press, c1984-. June 2000. v. 17 (3) p. 305-313.

Record 115
AU: Leigh,-E.
TI: Antioxidant activity of tea unaffected milk.
SO: HerbalGram. Austin, TX : American Botanical Council and the Herb Research Foundation. 2000. (50) p. 25.

Record 116
AU: Akula,-A.; Akula,-C.; Bateson,-M.
TI: Betaine a novel candidate for rapid induction of somatic embryogenesis in tea (Camellis sinensis (L.) O.Kuntze).
SO: Plant-growth-regul. Dordrecht : Kluwer Academic Publishers. Mar 2000. v. 30 (3) p. 241-246.

Record 117
AU: Lis-Balchin,-M.; Hart,-S.L.; Deans,-S.G.
TI: Pharmacological and antimicrobial studies on different tea-tree oils (Melaleuca alternifolia, Leptospermum scoparium or Manuka and Kunzea ericoides or Kanuka), originating in Australia and New Zealand.
SO: PTR,-Phytother-res. West Sussex : John Wiley & Sons Ltd. Dec 2000. v. 14 (8) p. 623-629.

Record 118
AU: Virtue,-J.G.; Sutton,-B.G.; Murtagh,-G.J.; Cousens,-R.D.
TI: Weed interference reduces yield of coppiced tea tree (Melaleuca alternifolia).
SO: Aust-j-exp-agric. Collingwood, Vic. Australia : CSIRO Australia. 2000. v. 40 (8) p. 1157-1164.

Record 119
AU: Kim,-K.Y.; Chung,-H.J.
TI: Flavor compounds of pine sprout tea and pine needle tea.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Apr 2000. v. 48 (4) p. 1269-1272.
AB: Flavor compounds of pine sprout tea and pine needle tea were analyzed and identified in this study. Eighty-one and 39 kinds of flavor compounds were detected in pine sprout tea and pine needle tea by GC, respectively. Among them, 55 and 29 flavor compounds were identified by GC-MS, respectively. Major flavor compounds of pine sprout tea were alpha-pinene, myrcene, beta-thujene, terpinene-4-ol, and delta-cadinene, and major flavor compounds of pine needle tea were alpha-pinene, isoamyl alcohol, trans-caryophyllene, terpinene-4-ol, alpha-terpineol, and delta-cadinene.

Record 120
AU: Romani,-A.; Minunni,-M.; Mulinacci,-N.; Pinelli,-P.; Vincieri,-F.F.; Del-Carlo,-M.; Mascini,-M.
TI: Comparison among differential pulse voltammetry, amperometric biosensor, and HPLC/DAD analysis for polyphenol determination.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Apr 2000. v. 48 (4) p. 1197-1203.
AB: Polyphenols are widespread in vegetables and fruits. They can play an important role in human diet and health, and they influence the sensorial properties of many foods, and act as natural antioxidants. This study was conducted using HPLC/DAD, tyrosinase biosensor, and differential pulse voltammetry (DPV) analyses to detect polyphenolic compounds in natural complex

matrices. The analyses were applied to a series of both standards and natural extracts derived from grape, olives, and green tea. The pure compounds include phenolic acids, flavones, flavonols, catechins, tannins, and oleuropein. HPLC/DAD, DPV, and the biosensor approach were used as independent analytical techniques. Bare graphite screen-printed electrodes were employed in DPV and in the biosensor analysis. The most accurate data were obtained by HPLC/DAD analysis, while the DPV approach using screen-printed electrodes could represent a quick screening method for the determination of polyphenols in natural extracts. Use of the biosensor for the analysis of complex matrices needs further study in order to improve its performance.

Record 121
AU: Zhu,-N.; Huang,-T.C.; Yu,-Y.; LaVoie,-E.J.; Yang,-C.S.; Ho,-C.T.
TI: Identification of oxidation products of (-)-epigallocatechin gallate and (-)-epigallocatechin with H2O2.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Apr 2000. v. 48 (4) p. 979-981.
AB: (-)-Epigallocatechin gallate (EGCG) and (-)-epigallocatechin (EGC) are two important antioxidants in tea. They also display some antitumor activities, and these activities are believed to be mainly due to their antioxidative effects. However, the specific mechanisms of antioxidant action of tea catechins remain unclear. In this study are isolated and identified two novel reaction products of EGCG and one product of EGC when they were reacted separately with H2O2. These products are formed by the oxidation and decarboxylation of the A ring in the catechin molecule. This study provides unequivocal proof that the A ring of EGCG and EGC may also be an antioxidant site. This study also indicates an additional reaction pathway for the oxidation chemistry of tea catechins.

Record 122
AU: Grubben,-M.J.; Boers,-G.H.; Blom,-H.J.; Broekhuizen,-R.; Jong,-R.-de.; Rijt,-L.-van.; Ruijter,-E.-de.; Swinkels,-D.W.; Nagengast,-F.M.; Katan,-M.B.
TI: Unfiltered coffee increases plasma homocysteine concentrations in healthy volunteers: a randomized trial.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. Feb 2000. v. 71 (2) p. 480-484.
AB: Background: An elevated plasma homocysteine concentration is a putative risk factor for cardiovascular disease. Observational studies have reported an association between coffee consumption and plasma homocysteine concentrations. Objective: We studied the effect of coffee consumption on plasma homocysteine in a crossover trial. We used unfiltered coffee so as to include the possible effects of coffee diterpenes, which are removed by filtering. Design: Sixty-four healthy volunteers (31 men and 33 women) with a mean (+/-SD) age of 43 +/- 11 y were randomly assigned to 2 groups. One group (n = 30) drank 1 L unfiltered cafetiere (French press) coffee daily for 2 wk. Such coffee is rich in the cholesterol-raising diterpenes kahweol and cafestol. The other group (n = 34) received water, milk, broth, tea, and chocolate drinks instead of coffee. After a washout period of 8 wk, both groups received the alternate intervention for another 2 wk. Results: Consumption of 1 L unfiltered coffee/d for 2 wk significantly raised fasting plasma homocysteine concentrations by 10%, from 12.8 to 14.0 micromol/L. Conclusions: Unfiltered coffee increases plasma homocysteine concentrations in volunteers with normal initial concentrations. It is unclear whether the effect is caused by the cholesterol-raising diterpenes present exclusively in unfiltered coffee or by factors that are also present in filtered coffee.

Record 123
AU: Hegarty,-V.M.; May,-H.M.; Khaw,-K.T.
TI: Tea drinking and bone mineral density in older women.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. Apr 2000. v. 71 (4) p. 1003-1007.

Record 124
AU: Akula,-A.; Becker,-D.; Bateson,-M.
TI: High-yielding repetitive somatic embryogenesis and plant recovery in a selected tea clone, 'TRI-2025', by temporary immersion.
SO: Plant-cell-rep. Berlin : Springer-Verlag. Dec 2000. v. 19 (12) p. 1140-1145.
AB: Methods for improving the efficiency of repetitive somatic embryogenesis and plant recovery from somatic embryos of clonal tea, TRI 2025 [Camellia sinensis (L.) O. Kuntze] were investigated by optimising the immersion frequencies of the explants using a modified temporary immersion system (TIS). The relative efficiencies of three conventional methods for multiplying embryos were compared with the temporary immersion method. The highest rate of multiplication of secondary embryos (24-fold) was achieved using the TIS. By controlling the immersion cycles, we achieved more consistent, synchronised multiplication and embryo development with a high level of plant recovery. A one-step computer-programmed immersion protocol based on a single, simple medium with no growth regulators was developed, enabling multiplication, maturation, germination and plant recovery within 17 weeks. Plantlets recovered through this method were hardy, with 2- to 5-cm-long shoots containing a minimum of 2-4 lush green leaves and a well-formed taproot. Callus formation, hyperhydricity and other developmental abnormalities were not observed at any stage in the process. Plantlets produced using this method were successfully acclimatised to glasshouse conditions. This protocol avoids culture transfers, and thus minimises the risk of contamination and reduces labour costs. This technique could have significant commercial implications in tea propagation as it has the potential for large-scale production with considerably reduced production costs.

Record 125
AU: Yang,-C.; Chung,-J.Y.; Yang,-G.Y.; Chhabra,-S.K.; Lee,-M.J.
TI: Tea and tea polyphenols in cancer prevention.
SO: J-nutr. Bethesda : American Society for Nutritional Sciences. Feb 2000. v. 130 (2S) p. 472S-478S.
AB: The inhibitory action of tea (Camellia sinensis) and tea components against cancer formation has been demonstrated in different animal models involving different organ sites in many laboratories. The possible preventive activity of tea against cancer in humans, however, is not clear. A critical question is whether the information obtained from animal studies is applicable to humans because of possible species differences or the difference in the quantity of tea used in animal studies and that consumed by humans. This article will discuss the results from animal studies and possible cancer inhibitory mechanisms that might be applicable to human cancer prevention. To provide a basis for more quantitative analyses of the effect of tea on carcinogenesis, the levels of tea polyphenols in blood, urine and tissue samples have been analyzed, and the pharmacokinetic properties of tea polyphenols studied. Studies with cell lines have demonstrated that tea polyphenols affect signal transduction pathways, inhibit cell proliferation and induce apoptosis, but the effective concentrations are usually much higher than those observed in blood and tissues. More mechanistic studies in these areas will help us to understand the inhibitory action of tea against carcinogenesis and provide background for evaluating the effects of tea consumption on human carcinogenesis.

Record 126
AU: Kelloff,-G.J.; Crowell,-J.A.; Steele,-V.E.; Lubet,-R.A.; Malone,-W.A.; Boone,-C.W.; Kopelovich,-L.; Hawk,-E.T.; Lieberman,-R.; Lawrence,-J.A.
TI: Progress in cancer chemoprevention: development of diet-derived chemopreventive agents.
SO: J-nutr. Bethesda : American Society for Nutritional Sciences. Feb 2000. v. 130 (2S) p. 467S-471S.
AB: Because of their safety and the fact that they are not perceived as "medicine", food-derived products are highly interesting for development as chemopreventive agents that may find widespread, long-term use in populations at

normal risk. Numerous diet-derived agents are included among the >40 promising agents and agent combinations that are being evaluated clinically as chemopreventive agents for major cancer targets including breast, prostate, colon and lung. Examples include green and black tea polyphenols, soy isoflavones, Bowman-Birk soy protease inhibitor, curcumin, phenethyl isothiocyanate, sulforaphane, lycopene, indole-3-carbinol, perillyl alcohol, vitamin D, vitamin E, selenium and calcium. Many food-derived agents are extracts, containing multiple compounds or classes of compounds. For developing such agents, the National Cancer Institute (NCI) has advocated codevelopment of a single or a few putative active compounds that are contained in the food-derived agent. The active compounds provide mechanistic and pharmacologic data that may be used to characterize the chemopreventive potential of the extract, and these compounds may find use as chemopreventives in higher risk subjects (patients with precancers or previous cancers). Other critical aspects to developing the food-derived products are careful analysis and definition of the extract to ensure reproducibility (e.g., growth conditions, chromatographic characteristics or composition), and basic science studies to confirm epidemiologic findings associating the food product with cancer prevention.

Record 127
AU: Faust,-M.B.; Christians,-N.E.
TI: Copper reduces shoot growth and root development of creeping bentgrass.
SO: Crop-sci. Madison, Wis. : Crop Science Society of America, 1961-. Mar/Apr 2000. v. 40 (2) p. 498-502.
AB: Sand-based golf course putting greens have been observed to contain elevated Cu concentrations, based on standard soil tests. Little research has been conducted that relates Cu concentration in sand media to turfgrass performance. The objectives of this study were to determine the response of greenhouse-grown creeping bentgrass (Agrostis palustris Huds. 'Penncross') to treatments in rooting media that ranged from 0 to 600 mg Cu kg-1 and to provide an estimate of potentially toxic plant-available Cu levels by use of the diethylenetriaminepentaacetic acid-triethanolamine (DTPA-TEA) soil test. Calcareous and silica sands were mixed individually with reed sedge peat in a 9:1 (v/v) ratio. Penncross sod plugs were placed on the top of pots containing the premixed sand-peat media and allowed to grow for 12 wk. The silica sand medium pH decreased from 6.8 to 5.4, while the pH of the calcareous medium remained between 7.2 to 7.3 as cupric sulfate (CuSO4(.)5H2O) concentrations increased. The average dry weight of clippings for plants grown in silica sand decreased 16% as Cu treatments increased from 0 to 600 mg kg-1. At 600 mg kg-1 Cu, dry root mass was 56 and 48% lower than the control treatments for plants grown in silica and calcareous sand, respectively. The DTPA-TEA soil test extracted, on average, 19% more Cu from the calcareous sand when compared to the silica sand. However, plant roots contained an average of 34% more Cu when grown in silica sand. These results indicate that the DTPA-TEA soil test was not a good predictor of potentially toxic plant-available Cu in sand-based media, and alternative soil test methods should be investigated.

Record 128
AU: Temple,-S.J.; Boxtel,-A.J.B.-van.
TI: A comparison of dryer types used for tea drying.
SO: J-agric-eng-res. London ; Orlando : Academic Press, 1956-. Dec 2000. v. 77 (4) p. 401-407.
AB: The objective of this work was to determine how various types of tea dryer would perform with different levels of inputs. Three dryer types were commonly found in practice, two others are not generally used and one type is unknown in practice. Simulation models for each type were constructed from a thin-layer drying model. The information gained from the simulations showed which type of dryer was more efficient at heat and air utilization. Graphs of the moisture content of the product discharged from the dryer show which variables need to be controlled most tightly in practice, and which variables might be successfully manipulated by a control system. This study has implications not only for the

control of various dryer types, but for the physical design of the dryers. The multi-stage fluid bed dryer with re-circulation is found to have the best combination of characteristics, and is the type increasingly used in industry.

Record 129
AU: Greenwalt,-C.J.; Steinkraus,-K.H.; Ledford,-R.A.
TI: Kombucha, the fermented tea: microbiology, composition, and claimed health effects.
SO: J-food-prot. Des Moines, Iowa : International Association of Milk, Food and Environmental Sanitarians. July 2000. v. 63 (7) p. 976-981.

Record 130
AU: Carducci,-C.N.; Dabas,-P.C.; Muse,-J.O.
TI: Determination of inorganic cations by capillary ion electrophoresis in Ilex paraguariensis (St.H.), a plant used to prepare tea in South America.
SO: J-AOAC-Int. Gaithersburg, MD : AOAC International. Sept/Oct 2000. v. 83 (5) p. 1167-1173.
AB: A practical and economical capillary ion electrophoresis method with indirect UV detection at 214 nm was developed for determination of inorganic cations in plants of Ilex paraguariensis (St. H.) and their infusion known as mate tea, a very popular beverage in South America. A microwave digestion procedure was used to prepare the herbal plants, but the infusion was only diluted. The background electrolyte contained 6 mM imidazole and 10 mM alpha-hydroxyisobutyric acid, pH 4.0. The running voltage was 20 kV and temperature was 25 degrees C. K, Na, Ca, Mg, and Mn ions were quantitated, and linearity was demonstrated between 0.6 and 120 ppm. The results were in good agreement with those obtained by flame atomic absorption and emission spectrometry. Accuracy of the method was verified by comparison with Beech leaves CRM 100, a standard reference material. The high content of minerals and several oligoelements, especially Mn in mate tea, is considered to be of nutritional interest.

Record 131
AU: Temple,-S.J.; Boxtel,-A.J.B.-van.; Straten,-G.-van.
TI: Control of fluid bed tea dryers: controller performance under varying operating conditions.
SO: Comput-electron-agric. Amsterdam : Elsevier, 1985-. Dec 2000. v. 29 (3) p. 217-231.

Record 132
AU: Temple,-S.J.; Boxtel,-A.J.B.-van.
TI: Control of fluid bed tea dryers: control in the context of design and operation conditions.
SO: Comput-electron-agric. Amsterdam : Elsevier, 1985-. Dec 2000. v. 29 (3) p. 209-216.

Record 133
AU: Griffin,-S.G.; Markham,-J.L.; Leach,-D.N.
TI: An agar dilution method for the determination of the minimum inhibitory concentration of essential oils.
SO: J-essent-oil-res. Carol Stream, Ill. : Allured Publishing Corporation. Mar/Apr 2000. v. 12 (2) p. 249-255.
AB: Methods for the measurement of the minimum inhibitory concentration (MIC) of antibacterial agents have been developed for water-soluble substances and require adaptation for use with water-insoluble essential oils. This paper reports a standardized agar dilution MIC method, using 0.5% v/v Tween 20 as a dispersant, which provides a reliable and reproducible technique. The method was tested using two Melaleuca alternifolia oil samples with two different levels of terpinen-4-ol (37% and 45% v/v). The MIC values of the tea tree oil samples against a wide selection of bacteria, moulds and yeast are reported.

Record 134

AU: Asekun,-O.T.; Ekundayo,-O.
TI: Essential oil constituents of Hyptis suaveolens (L.) Poit. (Bush tea) leaves from Nigeria.
SO: J-essent-oil-res. Carol Stream, Ill. : Allured Publishing Corporation. Mar/Apr 2000. v. 12 (2) p. 227-230.
AB: The essential oil of the leaves of Hyptis suaveolens (L.) Poit. from Nigeria was isolated by hydrodistillation. The oil was analyzed by GC and GC/MS. Of the 49 components which were detected, 39 amounting to 89.5% were identified. The dominant components were sabinene (16.5%), trans-alpha-bergamotene and beta-caryophyllene (19.8%), terpinen-4-ol (9.6%) and beta-pinene (8.6%).

Record 135
AU: Hackett,-C.A.; Wachira,-F.N.; Paul,-S.; Powell,-W.; Waugh,-R.
TI: Construction of a genetic linkage map for Camellia sinensis (tea).
SO: Heredity. Oxford : Blackwell Science Ltd. Oct 2000. v. 85 (pt. 4) p. 346-355.

Record 136
AU: Sreeramulu,-G.; Zhu,-Y.; Knol,-W.
TI: Kombucha fermentation and its antimicrobial activity.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. June 2000. v. 48 (6) p. 2589-2594.

Record 137
AU: Touart,-A.P.
TI: Time for (compost) tea in the northwest.
SO: Biocycle. Emmaus, PA : JG Press, c1981-. Oct 2000. v. 41 (10) p. 74-77.

Record 138
AU: Bess,-V.H.
TI: Understanding compost tea.
SO: Biocycle. Emmaus, PA : JG Press, c1981-. Oct 2000. v. 41 (10) p. 71-72.

Record 139
AU: Hodgson,-J.M.; Morton,-L.W.; Puddey,-I.B.; Beilin,-L.J.; Croft,-K.D.
TI: Gallic acid metabolites are markers of black tea intake in humans.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. June 2000. v. 48 (6) p. 2276-2280.

Record 140
AU: Miura,-Y.; Chiba,-T.; Miura,-S.; Tomita,-I.; Umegaki,-K.; Ikeda,-M.; Tomita,-T.
TI: Green tea polyphenols (flavan 3-ols) prevent oxidative modification of low density lipoproteins: an ex vivo study in humans.
SO: J-nutr-biochem. New York, N.Y. : Elsevier Science Inc. Apr 2000. v. 11 (4) p. 216-222.

Record 141
AU: Lu,-Y.; Umeda,-T.; Yagi,-A.; Sakata,-K.; Chaudhuri,-T.; Ganguly,-D.K.
TI: Triterpenoid saponins from the roots of tea plant (Camellia sinensis var. assamica).
SO: Phytochemistry-Oxford. Oxford : Elsevier Science Ltd. Apr 2000. v. 53 (8) p. 941-946.
AB: Three olean-12-ene type triterpenoid saponins, named TR-saponins A, B and C, were isolated as methyl esters from tea roots (Camellia sinensis var. assamica) after treatment with diazomethane. Their structures were established as the methyl esters of 3-O-alpha-L-arabinopyranosyl (1 leads to 3)-beta-D-glucuronopyranosyl-21, 22-di-O-angeloyl-R1-barrigenol-23-oic acid, 3-O-alpha-L-arabinopyranosyl (1 leads to 3)-beta-D-glucuronopyranosyl-21-O-angeloyl -22-O-2-methylbutanoyl-R1-barrigenol-23-oic acid and 3-O-alpha-L-arabinopyranosyl (1 leads to 3)-beta-D-glucuronopyranosyl-16alpha-O-acetyl -21-O-angeloyl-22-O-2-

methylbutanoyl-R1-barrigenol -23-oic acid,2 by extensive 1D and 2D-NMR as well as FABMS and HR-MS analyses.

Record 142
AU: Unno,-T.; Sugimoto,-A.; Kakuda,-T.
TI: Scavenging effect of tea catechins and their epimers on superoxide anion radicals generated by a hypoxanthine and xanthine oxidase system.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Apr 2000. v. 80 (5) p. 601-606.

Record 143
AU: Hodgson,-J.M.; Puddey,-I.B.; Croft,-K.D.; Burke,-V.; Mori,-T.A.; Caccetta,-R.A.A.; Beilin,-L.J.
TI: Acute effects of ingestion of black and green tea on lipoprotein oxidation.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. May 2000. v. 71 (5) p. 1103-1107.

Record 144
AU: Zohouri,-F.V.; Rugg-Gunn,-A.J.
TI: Sources of dietary fluoride intake in 4-year-old children residing in low, medium and high fluoride areas in Iran.
SO: Int-j-food-sci-nutr. Oxfordshire, UK. : Carfax Publishing. Sept 2000. v. 51 (5) p. 317-326.

Record 145
AU: Langley-Evans,-S.C.
TI: Consumption of black tea elicits an increase in plasma antioxidant potential in humans.
SO: Int-j-food-sci-nutr. Oxfordshire, UK. : Carfax Publishing. Sept 2000. v. 51 (5) p. 309-315.

Record 146
AU: Pandey,-A.; Man,-L.; Palni,-L.M.S.; Bag,-N.
TI: Biological hardening of tissue culture raised tea plants through rhizosphere bacteria.
SO: Biotechnol-lett. Dordrecht : Kluwer Academic Publishers. July 2000. v. 22 (13) p. 1087-1091.

Record 147
AU: Maat,-M.P.M.-de.; Pijl,-H.; Kluft,-C.; Princen,-H.M.G.
TI: Consumption of black and green tea has no effect on inflammation, haemostasis and endothelial markers in smoking healthy individuals.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. Oct 2000. v. 54 (10) p. 757-763.

Record 148
AU: Juhel,-C.; Armand,-M.; Pafumi,-Y.; Rosier,-C.; Vandermander,-J.; Lairon,-D.
TI: Green tea extract (AR25) inhibits lipolysis of triglycerides in gastric and duodenal medium in vitro.
SO: J-nutr-biochem. New York, N.Y. : Elsevier Science Inc. Jan 2000. v. 11 (1) p. 45-51.

Record 149
AU: Takatsuka,-J.; Kunimi,-Y.
TI: Intestinal bacteria affect growth of Bacillus thuringiensis in larvae of the oriental tea tortrix, Homona magnanima Diakonoff (Lepidoptera: Tortricidae).
SO: J-invertebr-pathol. Orlando, Fla. : Academic Press. Oct 2000. v. 76 (3) p. 222-226.

Record 150
AU: Merken,-H.M.; Beecher,-G.R.

TI: Liquid chromatographic method for the separation and quantification of prominent flavonoid aglycones.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. Nov 3, 2000. v. 897 (1/2) p. 177-184.

Record 151
AU: Magoma,-G.N.; Wachira,-F.N.; Obanda,-M.; Imbuga,-M.; Agong,-S.G.
TI: The use of catechins as biochemical markers in diversity studies of tea (Camellia sinensis).
SO: Genet-resour-crop-evol. Dordrecht, The Netherlands : Kluwer Academic Publishers, c1992-. Apr 2000. v. 47 (2) p. 107-114.

Record 152
AU: Lodovici,-M.; Casalini,-C.; De-Filippo,-C.; Copeland,-E.; Xu,-X.; Clifford,-M.; Dolara,-P.
TI: Inhibition of 1,2-dimethylhydrazine-induced oxidative DNA damage in rat colon mucosa by black tea complex polyphenols.
SO: Food-chem-toxicol. Oxford, U.K. : Elsevier Science Ltd. Dec 2000. v. 38 (12) p. 1085-1088.

Record 153
AU: Lee,-K.T.; Lee,-C.D.; Yang,-M.S.; Yu,-C.C.
TI: Probabilistic design of storage capacity for rainwater cistern systems.
SO: J-agric-eng-res. London ; Orlando : Academic Press, 1956-. Nov 2000. v. 77 (3) p. 343-348.

Record 154
AU: Au,-A.P.; Reddy,-M.B.
TI: Caco-2 cells can be used to assess human iron bioavailability from a semipurified meal.
SO: J-nutr. Bethesda : American Society for Nutritional Sciences. May 2000. v. 130 (5) p. 1329-1334.

Record 155
AU: Homer,-L.E.; Leach,-D.N.; Lea,-D.; Lee,-L.S.; Henry,-R.J.; Baverstock,-P.R.
TI: Natural variation in the essential oil content of Melaleuca alternifolia Cheel (Myrtaceae).
SO: Biochem-syst-ecol. Oxford, U.K. : Elsevier Science Ltd. Apr 2000. v. 28 (4) p. 367-382.
AB: The composition and yield of oil in 615 trees representing the natural populations of Melaleuca alternifolia, or tea tree, was investigated. A sixth distinct oil chemotype was identified. Of the six chemotypes, one chemotype is dominated by terpinen-4-ol, one by 1,8-cineole, one by terpinolene and the remaining three chemotypes are all dominated by 1,8-cineole and differ in either terpinen-4-ol or terpinolene content. Whilst most chemotypes are present throughout the distribution range, a definite correspondence of oil types with geographic location was found. Terpinen-4-ol types predominate in and around the Bungawalbin basin in the Casino area of northern New South Wales (NSW), high 1,8-cineole types predominate toward the southern end of the distribution around Grafton and terpinolene types predominate in southern Queensland. Preliminary formulae have been developed to allow comparisons of oil data obtained by steam distillation with a static headspace gas chromatography method.

Record 156
AU: Yoshii,-K.; Kaihara,-A.; Tsumura,-Y.; Ishimitsu,-S.; Tonogai,-Y.
TI: Liquid chromatographic determination of emamectin, milbemectin, ivermectin and abamectin in crops and confirmation by liquid chromatography-mass spectrometry.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. Oct 27, 2000. v. 896 (1/2) p. 75-85.

Record 157
AU: Cao,-X.L.; Tian,-Y.
TI: Supercritical fluid extraction of catechins from Cratoxylum prunifolium Dyer and subsequent purification by high-speed counter-current chromatography.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. Nov 10, 2000. v. 898 (1) p. 75-81.

Record 158
AU: Santos-Buelga,-C.; Scalbert,-A.
TI: Proanthocyanidins and tannin-like compounds--nature, occurrence, dietary intake and effects on nutrition and health.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. May 15, 2000. v. 80 (7) p. 1094-1117.
AB: Proanthocyanidins (syn condensed tannins) are complex flavonoid polymers naturally present in cereals, legume seeds and particularly abundant in some fruits and fruit juices. They share some common structural features--phenolic nature and high molecular weight--with phenolic polymers found in black tea and red wine (called here tannin-like compounds). The polymeric nature of proanthocyanidins makes their analysis and estimation in food difficult. For this reason, little is known about their consumption, although they likely contribute a large part of the daily polyphenol intake. They also share common physicochemical properties: they form stable complexes with metal ions and with proteins and are, like other polyphenols, good reducing agents. Many of their biological effects of nutritional interest derive from these properties. As metal ion chelators, they influence the bioavailability of several minerals. The nutritional significance of the non-specific complexation of proteins is less clear. As reducing agents, they may participate in the prevention of cancers, both of the digestive tract and inner organs. They may also protect LDLs against oxidation and inhibit platelet aggregation and therefore prevent cardiovascular diseases. In vitro, animal and human studies on the prevention of these chronic diseases are reviewed with particular attention to wine and tea polyphenols. The lack of data on their bioavailability and the paucity of human studies are emphasised.

Record 159
AU: Hollman,-P.C.H.; Arts,-I.C.W.
TI: Flavonols, flavones and flavanols--nature, occurrence and dietary burden.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. May 15, 2000. v. 80 (7) p. 1081-1093.
AB: Total flavonol and flavone contents of foods have been determined with validated state-of-the-art methods. Quercetin dominates, and flavonol levels found in vegetables and fruits are below 10 mg kg-1. However, high concentrations are found in onions (300 mg kg-1), kale (450 mg kg-1), broccoli (100 mg kg-1), beans (50 mg kg-1), apples (50 mg kg-1), blackcurrants (40 mg kg-1), and tea (30 mg l-1). The dietary intake of flavonols varies 10-fold between countries (6-60 mg day-1). Flavones are of minor importance in the diet. Tea, wine and fruits are the most important sources of flavanols, but there are gaps in our knowledge on flavanol levels of many foods. The absorption of dietary quercetin glycosides in humans ranges from 20 to 50%. The sugar moiety is an important determinant of the bioavailability of flavonols. The presence of a glucose moiety significantly enhances absorption. The extent of absorption of flavanols in humans seems similar to that of flavonols but has been little studied. Flavonols and flavanols are extensively metabolised, as only 1-2% of them are excreted with an intact flavonoid backbone. Hepatic biotransformations include glucuronidation and sulphatation of the phenolic hydroxyls and O-methylation of catechol groups. Bacteria of the colon cleave the C-ring of the flavonoid nucleus to phenolic acids which are subsequently absorbed. Apart from conjugates, virtually no metabolites have been characterised in humans. Absorption of flavanols is rather fast, with times to reach peak values between 0.5 and 4 h. Flavonols are rapidly excreted, with elimination half-lives of 1-6 h. Quercetin glucosides show rapid to slow absorption; peak values are reached.

between <0.5 and 9 h. The type of glycoside determines the rate of absorption. Excretion of quercetin glycosides is slow: elimination half-lives are 24 h, independent of the type of glycoside. Analytical data for flavanols in foods are needed. Tea, as an important dietary source, has to be studied. Research on the bioavailability of flavonols and flavanols has to be expanded. Attention is needed for the identification and quantification of their metabolites in body fluids.

Record 160
AU: Tomas-Barberan,-F.A.; Clifford,-M.N.
TI: Dietary hydroxybenzoic acid derivatives--nature, occurrence and dietary burden.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. May 15, 2000. v. 80 (7) p. 1024-1032.
AB: Quantitative data for hydroxybenzoic acids (naturally occurring and permitted additives) and their conjugates in foods and beverages are summarised. Tea, rosaceous fruits, red wines and potatoes are important sources for which more comprehensive compositional data are required. Their absorption, metabolism, toxicological evaluation and possible biological significance are discussed. There are insufficient data to properly define the dietary burdens, but it would seem that ellagic acid and gallic acid from natural sources may dominate in many cases, although the intake of added benzoic acid may be of similar magnitude. It is pointed out that an additional, previously overlooked and possibly significant burden, particularly of benzoic acid itself, might arise as a result of the gut flora metabolism of larger-mass dietary phenols.

Record 161
AU: Degenhardt,-A.; Engelhardt,-U.H.; Lakenbrink,-C.; Winterhalter,-P.
TI: Preparative separation of polyphenols from tea by high-speed countercurrent chromatography.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Aug 2000. v. 48 (8) p. 3425-3430.
AB: High-speed countercurrent chromatography (HSCCC) was applied to the separation of polyphenols from tea leaves (Camellia sinensis L.). The capability of HSCCC to isolate pure tea polyphenols from complex mixtures on a preparative scale was demonstrated for catechins, flavonol glycosides, proanthocyanidins, and strictinin from green and black tea. The purity and identity of isolated compounds was confirmed by 1H NMR and HPLC-ESI-MS/MS. Gram quantities of polyphenols from tea can be isolated with the procedure described.

Record 162
AU: Kaundun,-S.S.; Zhyvoloup,-A.; Park,-Y.G.
TI: Evaluation of the genetic diversity among elite tea (camellia sinensis var. sinensis) accessions using RAPD markers.
SO: Euphytica. Dordrecht : Kluwer Academic Publishers. 2000. v. 115 (1) p. 7-16.

Record 163
AU: Noroozi,-M.; Burns,-J.; Crozier,-A.; Kelly,-I.E.; Lean,-M.E.J.
TI: Prediction of dietary flavonol consumption from fasting plasma concentration or urinary excretion.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. Feb 2000. v. 54 (2) p. 143-149.
AB: Objectives: To predict flavonols content of the habitual diets of free-living subjects from urine and plasma concentrations of flavonols. Design: Ten type 2 diabetic patients (five male, five female), mean age 60 (s.e.m. 7) y and BMI 30.2 (s.e.m. 3.5) kg/m(2) were treated in a random crossover design for a 2 week period on either a low flavonoid diet or on the same diet supplemented at one of two high flavonols levels (total 77.3 or 110.4 mg/day) provided by supplements of 1500 ml tea daily and 400 g fried white onion in olive oil with and without tomato ketchup and herbs. Setting: Glasgow Royal Infirmary,

University of Glasgow, Scotland. Main outcome measures: Fasting plasma concentration, urine concentration and 24 h excretion of quercetin, isorhamnetin, kaempferol and myricetin. Results: Plasma flavonol concentration (r=0.750, P=0.001), 24 h urine concentration (r=0.847, P=0.001) and 24 h urine excretion (r=0.728, P=<0.001) were all highly significantly related to dietary intake and gave similar estimates of intakes. Fasting plasma flavonols concentrations on habitual diets ranged from 0 to 43.7 ng/ml mean. Regression equations were constricted: total flavonols intake r=0.74, P<0.001 and quercetin intake r=0.744, P<0.001. From these equations, flavonol intakes from habitual diets were estimated at 17-50, mean 35 mg/day. Of this, 91% was from quercetin. Conclusions: Dietary flavonols are absorbed and appear in plasma and urine as potential biomarkers in concentrations related quantitatively to intake. Estimation of dietary intake from plasma or urine concentrations appears possible.

Record 164
AU: Jaganyi,-D.; Mdletshe,-S.
TI: Kinetics of tea infusion. 2. The effect of tea-bag material on the rate and temperature dependence of caffeine extraction from black Assam tea.
SO: Food-chem. Oxford : Elsevier Science Limited. Aug 2000. v. 70 (2) p. 163-165.

Record 165
AU: Tang,-S.Z.; Kerry,-J.P.; Sheehan,-D.; Buckley,-D.J.; Morrissey,-P.A.
TI: Dietary tea catechins and iron-induced lipid oxidation in chicken meat, liver and heart.
SO: Meat-sci. Oxford : Elsevier Science Limited. Nov 2000. v. 56 (3) p. 285-290.

Record 166
AU: Yang,-L.; Leung,-L.K.; Huang,-Y.; Chen,-Z.Y.
TI: Oxidative stability of conjugated linoleic acid isomers.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. Aug 2000. v. 48 (8) p. 3072-3076.
AB: Conjugated linoleic acids (CLAs) have been shown to be a strong anticarcinogen in a number of animal models. Our previous study demonstrated that CLA as a whole was extremely unstable in air. The present study was undertaken further to examine the oxidative stability of individual CLA isomers using the combination of gas-liquid chromatography (GLC) and silver ion high-performance liquid chromatography (Ag-HPLC). It was found that CLA as a whole oxidized rapidly and more than 80% was degraded within 110 h in air at 50 degrees C. Four c,c-CLA isomers were most unstable followed by four c,t-CLA isomers. In contrast, four t,t-CLA isomers were relatively stable under the same experimental conditions. Both the oxygen consumption and the GLC analysis revealed that 200 ppm jasmine green tea catechins (GTCs) exhibited protection to CLA and were even stronger than 200 ppm butylated hydroxytoluene (BHT) when added to either CLA or canola oil containing 10% CLA. The present study emphasized that oxidative unstability of CLA should not be overlooked although CLA has many biological effects.

Record 167
AU: Teunou,-E.; Fitzpatrick,-J.J.
TI: Effect of storage time and consolidation on food powder flowability.
SO: J-food-eng. Oxford : Elsevier Science Ltd. Feb 2000. v. 43 (2) p. 97-101.
AB: This paper presents an evaluation of the effect of storage time and consolidation on the flowability of the following food powders: flour, tea and whey permeate. Instantaneous and temporal flow functions of the powders were measured to quantify the combined effects of compression stress and time. The flow functions were measured using a Jenike shear cell and a consolidating bench. A number of powder physical properties including moisture content, bulk

density and particle size were measured. These properties are used in interpreting and comparing the flowability measurements for each powder.

Record 168
AU: Nwuha,-V.
TI: Novel studies on membrane extraction of bioactive components of green tea in organic solvents. I.
SO: J-food-eng. Oxford : Elsevier Science Ltd. June 2000. v. 44 (4) p. 233-238.

Record 169
AU: Guzman-Grenfell,-A.M.; Bonilla-Hernandez,-M.A.; Gonzalez-Martinez,-M.T.
TI: Glucose induces a Na+,K+ -ATPase-dependent transient hyperpolarization in human sperm. I. Induction of changes in plasma membrane potential by the proton ionophore CCCP.
SO: Biochim-biophys-acta. Amsterdam : Elsevier Science B.V. Apr 5, 2000. v. 1464 (2) p. 188-198.
AB: When human sperm was incubated in medium deprived of glucose, glucose restoration caused a transient hyperpolarization of the plasma membrane. This hyperpolarization was also induced by fructose but not by 2-deoxyglucose, a substrate that cannot be metabolized. The hyperpolarization was inhibited by NaF, a glycolysis inhibitor, but not by mitochondrial inhibitors (cyanide, rotenone and antimycin), suggesting that it depended on glycolysis. Furthermore, the hyperpolarization was still induced in medium containing a high concentration of KCl and was insensitive to the K+ channel blocker TEA and the Cl- channel blocker niflumic acid, but it was blocked by ouabain. This suggested that upon glucose addition, there was an increase in the concentration of ATP, that in turns increased the Na+,K+ -ATPase activity. Since this pump is electrogenic (2K+/3Na+) the plasma membrane hyperpolarized. On the other hand, CCCP, a proton ionophore, inhibited the hyperpolarization induced by glucose. When CCCP was added to glucose-treated hyperpolarized sperm, it caused a depolarization that triggered a Ca2+ influx sensitive to nickel, an inhibitor of voltage-dependent calcium channels. Moreover, CCCP caused hyperpolarization in sperm incubated in medium without calcium, a known condition that depolarizes sperm. This indicated that CCCP induced proton permeability in the plasma membrane that was able to change the membrane potential to a value corresponding to the EH and that was also able to clamp it, so that it prevented the hyperpolarization induced by glucose.

Record 170
AU: Wright,-L.P.; Mphangwe,-N.I.K.; Nyirenda,-H.E.; Apostolides,-Z.
TI: Analysis of caffeine and flavan-3-ol composition in the fresh leaf of Camellia sinesis for predicting the quality of the black tea produced in Central and Southern Africa.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Oct 2000. v. 80 (13) p. 1823-1830.
AB: A parameter of fresh tea leaf that correlates with black tea quality is highly desired. Twenty good and 20 poor quality tea clones were selected from the breeding programme at the Tea Research Foundation (Central Africa) (TRF(CA)). The flavan-3-ol profile of fresh tea leaves was analysed by capillary electrophoresis while total theaflavin (TF) content was determined in the black tea manufactured from the same leaves for each clone. The above parameters were correlated with total scores and valuation from two tea tasters with regression analysis. The significance of the differences between the 20 good and 20 poor quality tea clones was determined with the Student's t-test. The total TF content of the black tea correlated ($r = 0.63$, $P=0.0001$) well with the value of the tea. Of all the parameters determined in the fresh leaves, the highest correlation was obtained with (-)-epicatechin (EC) ($r=0.65$, $P=0.0001$). This may facilitate early selection of good quality TRF(CA) clones in the future.

Record 171
AU: Zijp,-I.M.; Korver,-O.; Tijburg,-L.B.M.

TI: Effect of tea and other dietary factors on iron absorption.
SO: Crit-rev-food-sci-nutr. Boca Raton, Fla. : CRC Press, c1980-. 2000. v. 40 (5) p. 371-398.
AB: Iron deficiency is a major world health problem, that is, to a great extent, caused by poor iron absorption from the diet. Several dietary factors can influence this absorption. Absorption enhancing factors are ascorbic acid and meat, fish and poultry; inhibiting factors are plant components in vegetables, tea and coffee (e.g., polyphenols, phytates), and calcium. After identifying these factors their individual impact on iron absorption is described. Specific attention was paid to the effects of tea on iron absorption. We propose a calculation model that predicts iron absorption from a meal. Using this model we calculated the iron absorption from daily menus with varying amounts of enhancers and inhibitors. From these calculations we conclude that the presence of sufficient amounts of iron absorption enhancers (ascorbic acid, meat, fish, poultry, as present in most industrialized countries) overcomes inhibition of iron absorption from even large amounts of tea. In individuals with low intakes of heme iron, low intakes of enhancing factors and/or high intakes of inhibitors, iron absorption may be an issue. Depletion of iron stores enhances iron absorption, but this effect is not adequate to compensate for the inhibition of iron absorption in such an inadequate dietary situation. For subjects at risk of iron deficiency, the following recommendations are made. Increase heme-iron intake (this form of dietary iron present in meat fish and poultry is hardly influenced by other dietary factors with respect to its absorption); increase meal-time ascorbic acid intake; fortify foods with iron. Recommendations with respect to tea consumption (when in a critical group) include: consume tea between meals.
instead of during the meal; simultaneously consume ascorbic acid and/or meat, fish and poultry.

Record 172
AU: Lakenbrink,-C.; Lapczynski,-S.; Maiwald,-B.; Engelhardt,-U.H.
TI: Flavonoids and other polyphenols in consumer brews of tea and other caffeinated beverages.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. July 2000. v. 48 (7) p. 2848-2852.
AB: The polyphenolic, flavonoid, and caffeine compositions of four commercial tea bag products (typical of those used in the UK, US, continental Europe, and the Middle East) and beverages prepared from them under a range of typical consumer use conditions have been studied. Leaf composition was determined by extraction with aqueous methanol: the absolute compositions of all four products were remarkably similar in terms of most phenolic compounds. The flavonoids comprised the major proportion (93-94%) of the total phenolics estimated by the Folin-Ciocalteu method. At brew times up to 2 min the composition of the brew solids was for each product practically independent of brew time, with flavonoids again comprising the major proportion (86-88%) of the total phenolics. The efficiency of extraction in brewing of total phenolics, total flavonoids, catechins, and theaflavins was up to 35-55% of the total available in the leaf, whereas the flavonol and flavone glycosides and caffeine were more efficiently extracted (up to 55-90%). The contribution of tea to the UK adult average total dietary intake of flavonols and flavones was calculated to be up to 80% depending on brewing conditions.

Record 173
AU: Viswanathan,-P.; Sriram,-V.; Yogeeswaran,-G.
TI: Sensitive spectrophotometric assay for 3-hydroxy-substituted flavonoids, based on their binding with molybdenum, antimony, or bismuth.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. July 2000. v. 48 (7) p. 2802-2806.
AB: A sensitive spectrophotometric assay has been developed for flavonoids based on their binding with molybdenum, antimony, or bismuth. Acetylation of the hydroxyl group of flavonoids abolished metal binding, thus suggesting a direct

role of the hydroxyl groups. From a comparison of several related flavonoids differing in the position of hydroxyl substitutions, the hydroxyl group at position 3 was found to be an important requirement for the formation of a yellow complex. This flavonoid metal complex showed that a specific and significant bathochromic shift in the visible spectrum of the native flavonoid and the corresponding lambdamax value was used for the colorimetric assays with different metal salts. The molybdenum complex was found to yield higher absorbance compared to antimony and bismuth complexes of various flavonoids. The present method offers a sensitive assay in the 5-25 nM range for these flavonoids and gave comparable results with HPLC quantitative determination.

Record 174
AU: Lin,-J.K.; Chen,-P.C.; Ho,-C.T.; Lin-Shiau,-S.Y.
TI: Inhibition of xanthine oxidase and suppression of intracellular reactive oxygen species in HL-60 cells by theaflavin-3,3'-digallate, (-)-epigallocatechin-3-gallate, and propyl gallate.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. July 2000. v. 48 (7) p. 2736-2743.
AB: The inhibitory effects of five tea polyphenols, namely theaflavin (TF1), theaflavin-3-gallate (TF2), theaflavin-3,3'-digallate (TF3), (-)-epigallocatechin-3-gallate (EGCG), and gallic acid, and propyl gallate (PG) on xanthine oxidase (XO) were investigated. These six antioxidant compounds reduce oxidative stress. Theaflavins and EGCG inhibit XO to produce uric acid and also act as scavengers of superoxide. TF3 acts as a competitive inhibitor and is the most potent inhibitor of XO among these compounds. Tea polyphenols and PG all have potent inhibitory effects (>50%) on PMA-stimulated superoxide production at 20 approximately 50 micromolar in HL-60 cells. Gallic acid (GA) showed no inhibition under the same conditions. At 10 micromolar, only EGCG, TF3, and PG showed significant inhibition with potency of PG > EGCG > TF3. The superoxide scavenging abilities of these six compounds are as follows: EGCG > TF2 > TF1 > GA > TF3 > PG. PG was the most potent inhibitor of PMA-stimulated H2O2 production in HL-60 cells. The order of H2O2 scavenging ability was TF2 > TF3 > TF1 > EGCG > PG > GA. Therefore, the antioxidative activity of tea polyphenols and PG is due not only to their ability to scavenge superoxides but also to their ability to block XO and related oxidative signal transducers.

Record 175
AU: Chao,-S.C.; Young,-D.G.; Oberg,-C.J.
TI: Screening for inhibitory activity of essential oils on selected bacteria, fungi and viruses.
SO: J-essent-oil-res. Carol Stream, Ill. : Allured Publishing Corporation. Sept/Oct 2000. v. 12 (5) p. 639-649.
AB: The purpose of this study was to examine the inhibitory effect of essential oils against a broad spectrum of microorganisms including bacteria, yeast, molds, and two bacteriophage. The inhibitory effects of 45 oils on eight bacteria (four Gram positive and four Gram negative), two fungi, and one yeast were examined using the disk assay method. Phage inhibition was measured by mixing the oils with a phage suspension, incubating the mixture at 4 degrees C for 24 h, then plating on a lawn of indicator bacteria and assaying for plaque production. Of the oils tested, all oils exhibited inhibition over activity relative to controls. However, a number exhibited only weak inhibition against several gram positive bacteria. Gram negative bacteria were generally more resistant than Gram positive bacteria to oil treatment with Pseudomonas aeruginosa being the most resistant bacteria. Only cinnamon bark (Cinnamomum zeylanicum) and tea tree (Melaleuca alternifolia) oils showed an inhibitory effect against all the test organisms and phage. Coriander oil (Coriandrum sativum) highly inhibited Gram positive bacteria and fungi. Lemongrass (Cymbopogon flexuosus) and Roman chamomile (Chamaemelum nobile) oils showed a high degree of inhibition against both phage types, while 8 oils showed no inhibition against either phage. Angelica (Angelica archangelica) and pine (Pinus sylvestris) oils inhibited the bacteria, but had no effect on any fungi.

Oils that exhibited high antimicrobial properties and the broadest range of inhibition included cinnamon bark (Cinnamomum zeylanicum), lemongrass (Cymbopogon flexuosus), savory (Satureja montana), Roman Chamomile (Chamaemelum nobile), rosewood (Aniba rosaeodora), spearmint (Mentha spicata).
and tea tree (Melaleuca alternifolia).

Record 176
AU: Demeule,-M.; Brossard,-M.; Page,-M.; Gingras,-D.; Beliveau,-R.
TI: Matrix metalloproteinase inhibition by green tea catechins.
SO: Biochim-biophys-acta. Amsterdam : Elsevier Science B.V. Mar 16, 2000. v. 1478 (1) p. 51-60.
AB: We have investigated the effects of different biologically active components from natural products, including green tea polyphenols (GTP), resveratrol, genistein and organosulfur compounds from garlic, on matrix metalloproteinase (MMP)-2, MMP-9 and MMP-12 activities. GTP caused the strongest inhibition of the three enzymes, as measured by fluorescence assays using gelatin or elastin as substrates. The inhibition of MMP-2 and MMP-9 caused by GTP was confirmed by gelatin zymography and was observed for MMPs associated with both various rat tissues and human brain tumors (glioblastoma and pituitary tumors). The activities of MMPs were also measured in the presence of various catechins isolated from green tea including (-)-epigallocatechin gallate (EGCG), (-)-epicatechin gallate (ECG). (-)-epigallocatechin (EGC), (-)-epicatechin (EC) and (+)-catechin (C). The most potent inhibitors of these activities, as measured by fluorescence and by gelatin or casein zymography, were EGCG and ECG. GTP and the different catechins had no effect on pancreatic elastase, suggesting that the effects of these molecules on MMP activities are specific. Furthermore, in vitro activation of proMMP-2 secreted from the glioblastomas cell line U-87 by the lectin concanavalin A was completely inhibited by GTP and specifically by EGCG. These results indicate that catechins from green tea inhibit MMP activities and proMMp-2 activation.

Record 177
AU: Hanley,-A.J.G.; Harris,-S.B.; Gittelsohn,-J.; Wolever,-T.M.S.; Saksvig,-B.; Zinman,-B.
TI: Overweight among children and adolescents in a Native Canadian community: prevalence and associated factors.
SO: Am-j-clin-nutr. Bethesda, Md. : American Society for Clinical Nutrition. Mar 2000. v. 71 (3) p. 693-700.
AB: Background: The prevalence of pediatric obesity in North America is increasing. Native American children are at especially high risk. Objectives: The objective was to evaluate the prevalence of pediatric overweight and associated behavioral factors in a Native Canadian community with high rates of adult obesity and type 2 diabetes mellitus. Design: Height and weight were measured in 445 children and adolescents aged 2-19 y. Fitness level, television viewing, body image concepts, and dietary intake were assessed in 242 subjects aged 10-19 y. Overweight was defined as a body mass index > or = 85th percentile value for age- and sex-specific reference data from the third National Health and Nutrition Examination Survey (NHANES III). Multiple logistic regression was used to examine factors associated with overweight, with adjustment for age and sex. Results: The overall prevalence of overweight in subjects aged 2-19 y was significantly higher than NHANES III reference data [boys: 27.7% (95% CI: 21.8, 34.5); girls: 33.7% (95% CI: 27.9, 40.1)]. In the subset aged 10-19 y, > or = 5 h television viewing/d was associated with a significantly higher risk of overweight than was < or = 2 h/d [odds ratio (OR) = 2.52; 95% CI: 1.06, 5.98]. Subjects in the third and fourth quartiles of fitness had a substantially lower risk of overweight than did those in the first quartile [third quartile compared with first quartile: OR = 0.24 (95% CI: 0.09, 0.66); fourth quartile compared with first quartile: OR = 0.13 (95% CI: 0.03, 0.48)]. Fiber consumption on the previous day was associated with a decreased risk of overweight (OR = 0.69; 95% CI: 0.47, 0.99 for each 0.77 g/MJ increase in fiber.

intake). Conclusions: Pediatric overweight is a harbinger of future diabetes risk and indicates a need for programs targeting primary prevention of obesity in children and adolescents.

Record 178
AU: Spiro,-M.; Jaganyi,-D.
TI: Kinetics and equilibria of tea infusion. 15. Transport of caffeine across a teabag membrane in a modified rotating diffusion cell.
SO: Food-chem. Oxford : Elsevier Science Limited. May 2000. v. 69 (2) p. 119-124.
AB: The rates of transfer of aqueous caffeine through a membrane of teabag paper were measured by means of a modified rotating diffusion cell. The reciprocals of the transfer rates were found to be directly proportional to the inverse square root of the rotation speed. These results are consistent with the rate-controlling step being diffusion of caffeine through the Nernst diffusion layers on each side of the membrane. At both 25 and 80 degrees C the resistance to transfer through the teabag membrane itself was negligible, showing that the material was well suited to the brewing of tea, coffee or other food materials.

Record 179
AU: Arts,-I.C.W.; Putte,-B.-van-de.; Hollman,-P.C.H.
TI: Catechin contents of foods commonly consumed in The Netherlands. 2. Tea, wine, fruit juices, and chocolate milk.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. May 2000. v. 48 (5) p. 1752-1757.
AB: Catechins, compounds that belong to the flavonoid class, are potentially beneficial to human health. To enable an epidemiological evaluation of catechins, data on their contents in foods are required. HPLC with UV and fluorescence detection was used to determine the levels of (+)-catechin, (-)-epicatechin, (+)-gallocatechin (GC), (-)-epigallocatechin (EGC), (-)-epicatechin gallate (ECg), and (-)-epigallocatechin gallate (EGCg) in 8 types of black tea, 18 types of red and white wines, apple juice, grape juice, iced tea, beer, chocolate milk, and coffee. Tea infusions contained high levels of catechins (102-418 mg of total catechins/L), and tea was the only beverage that contained GC, EGC, ECg, and EGCg in addition to (+)-catechin and (-)-epicatechin. Catechin concentrations were still substantial in red wine (27-96 mg/L), but low to negligible amounts were found in white wine, commercially available fruit juices, iced tea, and chocolate milk. Catechins were absent from beer and coffee. The data reported here provide a base for the epidemiological evaluation of the effect of catechins on the risk for chronic diseases.

Record 180
AU: Wang,-J.; Sporns,-P.
TI: MALDI-TOF MS analysis of food flavonol glycosides.
SO: J-agric-food-chem. Washington, D.C. : American Chemical Society. May 2000. v. 48 (5) p. 1657-1662.
AB: Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) is a new technique that is having a great impact on food analysis. This study is the first to demonstrate the use of MALDI-TOF MS to identify flavonol glycosides in food samples. 2',4',6'-Trihydroxyacetophenone was chosen as the best matrix because it worked for crude sample extracts and ionized flavonol glycosides in both positive and negative MALDI-TOF MS modes. In the positive mode, multiple ion forms were observed for flavonol glycosides, including [M + H]+, [M + Na]+, [M + K]+, and [M - H + Na + K]+, with further fragmentation through loss of glycosidic residues. The negative mode for all flavonol glycosides resulted in [M - H]- ion formation without detectable fragmentation. The multiple ions in the positive mode gave more information on individual flavonol glycoside structures than the negative mode. Flavonol glycosides showed similar

intensities or responses in the positive mode, while kaempferol glycosides exhibited much less response than quercetin glycosides in negative mode.

Record 181
AU: Takagaki,-A.; Fukai,-K.; Nanjo,-F.; Hara,-Y.
TI: Reactivity of green tea catechins with formaldehyde.
SO: J-wood-sci. Bunkyo-ku, Tokyo, Japan : Springer-Verlag Tokyo, [1998-. 2000. v. 46 (4) p. 334-338.

Record 182
AU: Biswas,-M.A.H.; Miyazaki,-Y.; Nomura,-K.; Wakita,-M.
TI: Influences of long-term feeding of Japanese green tea powder on laying perfromance on egg quality in hens.
SO: Asian-australas-j-anim-sci. Seoul, Korea : AAAP and Korean Society of Animal Nutrition. July 2000. v. 13 (7) p. 980-985.

Record 183
AU: Hanson,-S.
TI: Hip drinks bring cool profits in Japan.
SO: AgExporter. Washington, D.C. : United States Department of Agriculture, Foreign Agricultural Service. Sept 2000. v. 12 (9) p. 12-14.

Record 184
AU: Zhu,-M.; Chen,-Y.; Li,-R.C.
TI: Oral absorption and bioavailability of tea catechins.
SO: Planta-med. Stuttgart : Georg Thieme Verlag,. June 2000. v. 66 (5) p. 444-447.

Record 185
AU: Christoph,-F.; Kaulfers,-P.M.; Stahl-Biskup,-E.
TI: A comparative study of the in vitro antimicrobial activity of tea tree oils s.l. with special reference to the activity of beta-triketones.
SO: Planta-med. Stuttgart : Georg Thieme Verlag,. Aug 2000. v. 66 (6) p. 556-560.

Record 186
AU: Langley-Evans,-S.C.
TI: Antioxidant potential of green and black tea determined using the ferric reducing power (FRAP) assay.
SO: Int-j-food-sci-nutr. Oxfordshire, UK. : Carfax Publishing. May 2000. v. 51 (3) p. 181-188.

Record 187
AU: Ahmad,-N.; Cheng,-P.Y.; Mukhtar,-H.
TI: Cell cycle dysregulation by green tea polyphenol epigallocatechin-3-gallate.
SO: Biochem-biophys-res-commun. Orlando, Fla. : Academic Press. Aug 28, 2000. v. 275 (2) p. 328-334.

Record 188
AU: Yuan,-S.C.; Wang,-C.J.; Kuo,-H.W.; Maa,-M.C.; Hsieh,-Y.S.
TI: Effect of tea and coffee consumption on serum uric acid levels by liquid-chromatographic and uricase methods.
SO: Bull-environ-contam-toxicol. New York : Springer-Verlag, 1966-. Sept 2000. v. 65 (3) p. 300-306.

Record 189
AU: Rossetto,-M.; Harriss,-F.C.L.; McLauchlan,-A.; Henry,-R.J.; Baverstock,-P.R.; Lee,-L.S.
TI: Interspecific amplification of tea tree (Melaleuca alternifolia--Myrtaceae) microsatellite loci--potential implications for conservation studies.

SO: Aust-j-bot. Collingwood, Vic. Australia : CSIRO. 2000. v. 48 (3) p. 367-373.

Record 190
AU: Mizugaki,-M.; Ishizawa,-F.; Yamazaki,-T.; Hishinuma,-T.
TI: Epigallocatechin gallate increase the prostacyclin production of bovine aortic endothelial cells.
SO: Prostaglandins-other-lipid-mediat. New York, NY : Elsevier Science Inc. July 2000. v. 62 (2) p. 157-164.

Record 191
AU: Saha,-T.; Chatterjee,-S.; Saha,-K.; Chowdhury,-A.; Somchoudhury,-A.K.; Bhattacharyya,-A.
TI: Residues of Amitraz, a new acaricide, on tea.
SO: Bull-environ-contam-toxicol. New York : Springer-Verlag, 1966-. Aug 2000. v. 65 (2) p. 215-221.

Record 192
AU: Duong,-H.A.; Jensen,-N.
TI: Spoilage of iced tea by Alicyclobacillus.
SO: Food-Aust. North Sydney, Australia : Australian Institute of Food Science and Technology, Incorporated. July 2000. v. 52 (7) p. 292.

Record 193
AU: Higashi-Okai,-K.; Taniguchi,-M.; Okai,-Y.
TI: Potent antioxidative activity of non-polyphenolic fraction of green tea (Camellia sinensis)--association with pheophytins a and b.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Jan 1, 2000. v. 80 (1) p. 117-120.
AB: The antioxidative activity of green tea-derived polyphenols known as catechins has been extensively studied. However, the antioxidative activity of the non-polyphenolic fraction of green tea has been poorly elucidated and is the subject of the present study. The non-polyphenolic fraction of green tea showed a significant dose-dependent suppressive effect against the autooxidation of linoleic acid. The chlorophyll-related compounds pheophytins a and b showed similar antioxidative activities in the same assay, much higher than those of alpha-tocopherol and the green tea catechin (-)-epigallo-catechin-3-gallate (EGCG). The non-polyphenolic fraction of green tea and pheophytins a and b exhibited suppressive activities against superoxide anion (O2-) generation in mouse macrophages induced by 12-O-tetradecanoylphorbol-13-acetate, showing higher activities than that of EGCG. These results suggest that the non-polyphenolic fraction of green tea leaves has potent antioxidative activity and that this activity is associated with pheophytins a and b.

Record 194
AU: Catterall,-F.; Souquet,-J.M.; Cheynier,-V.; Clifford,-M.N.; Ioannides,-C.
TI: Modulation of the mutagenicity of food carcinogens by oligomeric and polymeric procyanidins isolated from grape seeds: synergistic genotoxicity with N-nitrosopyrrolidine.
SO: J-sci-food-agric. West Sussex : John Wiley & Sons Limited. Jan 1, 2000. v. 80 (1) p. 91-101.
AB: Oligomeric and polymeric procyanidins were isolated from grape seeds, and their antimutagenic potential against food carcinogens was evaluated in the Ames test. Both procyanidins suppressed the mutagenicity of IQ and benzo[a]pyrene but did not modulate the mutagenic activity of MNNG. At the concentrations where antimutagenic activity was expressed, the oligomeric and polymeric procyanidins inhibited the hepatic O-dealkylation of methoxy- and ethoxyresorufin. It is concluded that the antimutagenic activity exhibited by oligomeric and polymeric procyanidins is the consequence of inhibition of CYP1A-mediated bioactivation. In contrast with these findings, oligomeric and polymeric procyanidins potentiated the mutagenicity of N-nitrosopyrrolidine; the monomeric tea

flavanols (+)-catechin and (-)-epicatechin also elicited the same effect. Both the flavanols and procyanidins, at the concentrations studied, failed to elicit a mutagenic response in the Ames test, either in the presence or absence of an activation system. Incorporation of catalase and superoxide dismutase to the activation system failed to prevent the synergistic effect between (+)-catechin and the nitrosamine. The mutagenic activity of N-nitrosopyrrolidine was much higher when the bacteria were grown in nutrient broth supplemented with (+)-catechin compared with bacteria grown in nutrient broth alone. It may be cautiously inferred that the synergistic genotoxicity between polyphenolics and N-nitrosopyrrolidine involves interaction of (+)-catechin with bacterial DNA, facilitating the covalent binding of the ultimate carcinogens of the nitrosamine to the DNA.

Record 195
AU: Platzman,-A.D.
TI: Its time for iced tea: refreshing, healthful, but oh, so sweet.
SO: Environ-nutr. New York : Environmental Nutrition, Inc.,. July 2000. v. 23 (7) p. 5.

Record 196
AU: Kamimura,-Y.; Hayano,-K.
TI: Properties of protease extracted from tea-field soil.
SO: Biol-fertil-soils. Berlin, Germany : Springer-Verlag. 2000. v. 30 (4) p. 351-355.
AB: Crude enzyme extract was obtained from a low-pH soil from a tea field by shaking with 0.1 M PO4(3-) buffer (pH 7.0) Hydrolytic activity toward benzyloxycarbonyl-L-Phe-L-Leu (Z-L-Phe-L-Leu) and Z-L-Phe-L-Tyr-L-Leu showed two pH optima, at about pH 5 and 9, suggesting that the soil contained at least two protease components. The acid-type protease in the extract was assumed to be Ser-carboxypeptidase because phenylmethanesulphonyl fluoride and diisopropylphosphoro fluoridate inhibited its activity. Peptide bonds in the C-terminal residues of Leu-enkephalin and angiotensin I were split more by protease than those in the N-terminal residue. The apparent molecular weight of the acid-type protease was estimated to be 75 kDa by Sephadex G-100 gel filtration and the isoelectric point 4.4 by isoelectric focusing. A neutral-type protease in the extract was assumed to be a metallocarboxypeptidase because only o-phenanthrorine inhibited its activity. Peptide bonds in the C-terminal residues of Leu-enkephalin and angiotensin I were hydrolyzed to a greater extent than those in the N-terminal residues. The apparent molecular weight of the neutral-type protease was estimated to be 37 kDa and the isoelectric point 5.8, 8.0 and 9.4. The isoelectric 9.4 fraction showed the highest relative activity.

Record 197
AU: Leenen,-R.; Roodenburg,-A.J.C.; Tijburg,-L.B.M.; Wiseman,-S.A.
TI: A single dose of tea with or without milk increases plasma antioxidant activity in humans.
SO: Eur-j-clin-nutr. Basingstoke : Stockton Press. Jan 2000. v. 54 (1) p. 87-92.
AB: Objective: To investigate the effect of black and green tea consumption, with and without milk, on the plasma antioxidant activity in humans. Design: n a complete cross-over design, 21 healthy volunteers (10 male, 11 female) received a single dose of black tea, green tea (2 g tea solids in 300 ml water) or water with or without milk. Blood samples were obtained at baseline and at several time points up to 2 h post-tea drinking. Plasma was analysed for total catechins and antioxidant activity, using the ferric reducing ability of plasma (FRAP) assay. Results: Consumption of black tea resulted in a significant increase in plasma antioxidant activity reaching maximal levels at about 60 min. A larger increase was observed after consumption of green tea. As anticipated from the higher catechin concentration in green tea, the rise in plasma total catechins was significantly higher after consumption of green tea when compared to black tea. Addition of milk to black or green tea did not affect the observed

increases in plasma antioxidant activity. Conclusions: Consumption of a single dose of black or green tea induces a significant rise in plasma antioxidant activity in vivo. Addition of milk to tea does not abolish this increase. Whether the observed increases in plasma antioxidant activity after a single dose of tea prevent in vivo oxidative damage remains to be established.

Record 198
AU: Trevisanato,-S.I.; Kim,-Y.I.
TI: Tea and health.
SO: Nutr-rev. Washington, D.C.: International Life Sciences Institute--ILSI Press. Jan 2000. v. 58 (1) p. 1-10.
AB: Tea is a pleasant, popular, socially accepted, economical, and safe drink that is enjoyed every day by hundreds of millions of people across all continents. Tea also provides a dietary source of biologically active compounds that help prevent a wide variety of diseases. It is the richest source of a class of antioxidants called flavonoids and contains many other beneficial compounds such as vitamins and fluoride. A growing body of evidence suggests that moderate consumption of tea may protect against several forms of cancer, cardiovascular diseases, the formation of kidney stones, bacterial infections, and dental cavities. Future research needs to define the actual magnitude of health benefits, establish the safe range of tea consumption associated with these benefits, and elucidate potential mechanisms of action.

Record 199
AU: Sadecka,-J.; Polonsky,-J.
TI: Electrophoretic methods in the analysis of beverages.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. June 2, 2000. v. 880 (1/2) p. 243-279.

Record 200
AU: Sai-Ram,-M.; Anju,-B.; Pauline,-T.; Prasad,-D.; Kain,-A.K.; Mongia,-S.S.; Sharma,-S.K.; Singh,-B.; Singh,-R.; Ilavazhagan,-G.
TI: Effect of Kombucha tea on chromate(VI)-induced oxidative stress in albino rats.
SO: J-ethnopharmacol. Oxford : Elsevier Science Ltd. July 2000. v. 71 (1/2) p. 235-240.

Record 201
AU: Lee,-B.L.; Ong,-C.N.
TI: Comparative analysis of tea catechins and theaflavins by high-performance liquid chromatography and capillary electrophoresis.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. June 9, 2000. v. 881 (1/2) p. 439-447.

Record 202
AU: Leigh,-E.
TI: Black tea may protect heart health.
SO: HerbalGram. Austin, TX : American Botanical Council and the Herb Research Foundation. 2000. (48) p. 24-25.

Record 203
AU: Horie,-H.; Kohata,-K.
TI: Analysis of tea components by high-performance liquid chromatography and high-performance capillary electrophoresis.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. June 9, 2000. v. 881 (1/2) p. 425-438.

Record 204
AU: Dalluge,-J.J.; Nelson,-B.C.
TI: Determination of tea catechins.

SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. June 9, 2000. v. 881 (1/2) p. 411-424.

Record 205
AU: Anandacoomaraswamy,-A.; De-Costa,-W.A.J.M.; Shyamalie,-H.W.; Campbell,-G.S.
TI: Factors controlling transpiration of mature field-grown tea and its relationship with yield.
SO: Agric-for-meteorol. [Amsterdam] : Elsevier, [1984-. July 1, 2000. v. 103 (4) p. 375-386.

Record 206
AU: Shi,-X.; Ye,-J.; Leonard,-S.S.; Ding,-M.; Vallyathan,-V.; Castranova,-V.; Rojanasakul,-Y.; Dong,-Z.
TI: Antioxidant properties of (-)-epicatechin-3-gallate and its inhibition of Cr(VI)-induced DNA damage and Cr(IV)- or TPA-stimulated NF-kappaB activation.
SO: Mol-cell-biochem. Dordrecht, The Netherlands : Kluwer Academic Publishers. Mar 2000. v. 206 (1/2) p. 125-132.

Record 207
AU: Sugiyama,-K.; Morishita,-M.
TI: Production of seedless watermelon using soft-X-irradiated pollen.
SO: Sci-hortic. Amsterdam : Elsevier Science B.V. June 5, 2000. v. 84 (3/4) p. 255-264.

Record 208
AU: Aucamp,-J.P.; Hara,-Y.; Apostolides,-Z.
TI: Simultaneous analysis of tea catechins, caffeine, gallic acid, theanine and ascorbic acid by micellar electrokinetic capillary chromatography.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. Apr 21, 2000. v. 876 (1/2) p. 235-242.

Record 209
AU: Sun,-F.; Yu,-J.
TI: The effect of a special herbal tea on obesity and anovulation in androgen-sterilized rats.
SO: Proc-Soc-Exp-Biol-Med. Malden, Ma. : Blackwell Science, Inc. Mar 2000. v. 223 (3) p. 295-301.

Record 210
AU: Higashimoto,-M.; Akada,-Y.; Sato,-M.; Kinouchi,-T.; Kuwahara,-T.; Ohnishi,-Y.
TI: Inhibitory effects of tea extracts on the mutagenicity of 1-methyl-1,2,3,4-tetrahydro-beta-carboline-3-carboxylic acid on treatment with nitrite in the presence of ethanol.
SO: Food-chem-toxicol. Oxford, U.K. : Elsevier Science Ltd. Jan 2000. v. 38 (1) p. 7-13.

Record 211
AU: Aida,-R.; Kishimoto,-S.; Tanaka,-Y.; Shibata,-M.
TI: Modification of flower color in torenia (Torenia fournieri Lind.) by genetic transformation.
SO: Plant-sci. Oxford, UK : Elsevier Science Ltd. Apr 14, 2000. v. 153 (1) p. 33-42.

Record 212
AU: Mann,-C.M.; Cox,-S.D.; Markham,-J.L.
TI: The outer membrane of Pseudomonas aeruginosa NCTC 6749 contributes to its tolerance to the essential oil of Melaleuca alternifolia (tea tree oil).
SO: Lett-appl-microbiol. Oxford :. Apr 2000. v. 30 (4) p. 294-297.

Record 213

AU: Gupta,-S.; Ahmad,-N.; Nieminen,-A.L.; Mukhtar,-H.
TI: Growth inhibition, cell-cycle dysregulation, and induction of apoptosis by green tea constituent (-)-epigallocatechin-3-gallate in androgen-sensitive and androgen-insensitive human prostate carcinoma cells.
SO: Toxicol-appl-pharmacol. Orlando, Fla. : Academic Press. Apr 1, 2000. v. 164 (1) p. 82-90.

Record 214
AU: Zoller,-O.; Rhyn,-P.; Zimmerli,-B.
TI: High-performance liquid chromatographic determination of delta9-tetrahydrocannabinol and the corresponding acid in hemp containing foods with special regard to the fluorescence properties of delta9-tetrahydrocannabinol.
SO: J-chromatogr-A. Amsterdam ; New York : Elsevier, 1993-. Mar 3, 2000. v. 872 (1/2) p. 101-110.

Record 215
AU: Shih,-H.; Pickwell,-G.V.; Quattrochi,-L.C.
TI: Differential effects of flavonoid compounds on tumor promoter-induced activation of the human CYP1A2 enhancer.
SO: Arch-biochem-biophys. Orlando, Fla. : Academic Press. Jan 1, 2000. v. 373 (1) p. 287-294.

Record 216
TI: Forget the tea leaves, read the soil cores instead.
SO: Turf-grass-trends. Duluth, MN : Turf Grass Trends. Feb 2000. v. 9 (2) p. 12.

Record 217
AU: Abe,-I.; Seki,-T.; Umehara,-K.; Miyase,-T.; Noguchi,-H.; Sakakibara,-J.; Ono,-T.
TI: Green tea polyphenols: novel and potent inhibitors of squalene epoxidase.
SO: Biochem-biophys-res-commun. Orlando, Fla. : Academic Press. Feb 24, 2000. v. 268 (3) p. 767-771.

Record 218
AU: Clifford,-M.N.; Copeland,-E.L.; Bloxsidge,-J.P.; Mitchell,-L.A.
TI: Hippuric acid as a major excretion product associated with black tea consumption.
SO: Xenobiotica. London : Taylor & Francis, 1971-. Mar 2000. v. 30 (3) p. 317-326.

Record 219
AU: Pouw,-A.A.
TI: Hybrid tea rose plant named "Pansomro".
SO: US-pat-Plant. [Washington, D.C. : U.S. Patent and Trademark Office, 1976-. Jan 4, 2000. (11,171) 2 p.
AB: A new variety of hybrid tea rose plant producing pink blend flowers of good form and suitable for growing under glass.

Record 220
AU: Wang,-Zhenheng.; Wang,-Guangzhi.
TI: Zhongguo ming cha zhi. Di 1 ban.
SO: Beijing Shi : Zhongguo nong ye chu ban she : Xin hua shu dian Beijing fa xing suo fa xing, 2000. 4, 2, 2, 986 p., [63] p. of plates : ill. (some col.), map

Record 221
AU: Fernando,-Maxwell.
TI: The story of Ceylon tea.
SO: Colombo : Mlesna (Ceylon), 2000. 197 p. : chiefly col. ill., maps

Record 222
AU: Colton,-R.-T.
TI: Tea tree oil. 2nd ed.
SO: [Orange, N.S.W.] : NSW Agriculture, c2000. 43 p. : ill. (chiefly col.)

Record 223
AU: Mamedzade,-V.-T.
TI: Nekotorye pochvenno-ekologicheskie posledstviia monokul'tury chaia v Lenkoranskoi oblasti i puti ikh preodoleniia.
SO: Baku : Elm, 2000. 37 p. : ill.

Record 224
AU: Temple,-S.-J. (Stephen J.)
TI: Control of fluidized bed tea drying.
SO: [Wageningen : s.n., 2000?] xviii, 203, [1] p. : ill.