Index

Adequate Intakes, 39-41, 103-104 AHA, see American Heart Association ALA, see alpha-linolenic acid allergy, 102 alpha-linolenic acid (ALA), biologic effects, 29-32 β-oxidation, 23-25, 27 breast cancer, and, 78-81, 92 breast milk, and, 22, 29, 39, 41 cardiac rhythm, and, 68 cardioprotective effect, 57 cardiovascular disease, and, 40, 64-68 conversion to EPA and DHA, 26-28 deficiency, 29, 39 desaturation and elongation, 26, 28 DHA synthesis, 24, 27, 41 enriched eggs' content, 42-43 food sources, 12, 42-43 human milk, and, 41 in adipose tissue, 26, 66, 79-80, 86-87 intakes, 39-40, 103-104 ketone body formation, 23, 25 metabolism, 22-23, 25, 92

prostate cancer, 83-93 recommended dietary intakes, 39 recycling of ALA carbon, 25 stroke risk, and, 65 vegetable oils' content, 14, 59, 93 American Heart Association (AHA), 41.64 amino acids, 14-15 anticancer, 17, 50, 73, 75, 78, 81, 90. 101 antioxidants, 17-18, 44, 50-51, 55, 60-61, 71, 74, 93-95, 106 arachidonic acid, 24, 28, 31-33, 37-38, 41, 62, 112 aromatase, 51, 94 arrhythmia, 68 atherosclerosis, 37, 50, 53-54, 56-57, 59-60, 62-63, 69-70, 111

Blood clotting, 19, 54, 61 blood lipids, 17, 55-57, 60, 69, 71, 79, 86 blood pressure, 18, 29, 53-54, 58-59, 65, 69-70 blood cholesterol, 30, 53-58, 60, 63, diabetes, 8, 17, 28-30, 37, 51, 53-54, 65, 96 59, 96 bone metabolism, 95-96 dietary fibre, 7, 9-11, 16-17, 52, 57-58, brain development, 41-42 72, 74, 93-95, 97 breast cancer, 50-51, 74-81, 92, 94 mucilage gums, 16, 96 types of, 16 breast milk, 22, 29, 39, 41-42 diets. Paleolithic, 34 **C**anada, 9-10, 14, 21, 35, 41, 53, modern, 34-35 88-89, 101, 108-110 docosahexaenoic acid (DHA), cancer, biologic effects, 29, 31 breast, 50-51, 74-81, 92, 94 conversion from ALA, 24-28, 30, 41 colon, 93, 102 dietary intakes, 35 phytoestrogens, 74, 90 in fish, 41-42, 65, 99 process, 44, 72-74 in infancy, 33, 41 docosapentaenoic acid (DPA), prostate, 50, 55, 78, 82-93 carbohydrates, 11, 16, 50 conversion from ALA, 24-29 cardioprotective, dietary intakes, 35 effect, 57, 69 in fish, 42 mechanisms, 69-70 DPA, see docosapentaenoic acid cardiovascular disease (CVD), 37, 40-41, 53-55, 57-58, 63-71 definition, 53 **E**ggs, 8, 12, 19, 36, 42-43 flax and prevention diet, 71 omega-3-enriched, 8, 36, 42-43 inflammation, and, 8, 31, 37, 55, eicosanoids, 28, 30-33, 37-39, 54-55, 57, 62, 70 62, 69-70, 72-74, 97, 112 risk, 17, 54-63, 111 eicosapentaenoic acid (EPA), celiac disease, 15 biologic effects, 29, 31 cell adhesion molecules, 54-55, 59-60, conversion from ALA, 24-28 69-70, 111 endothelial dysfunction, 54, 59-60, conversion of ALA to EPA and DHA, 26-28 endothelium, 53-55, 59-60, 69, C-reactive protein, 32, 38, 63, 66, 111 111-112 enterodiol, 45-47, 50-51, 61, 93, 106 CVD, see cardiovascular disease cyanogenic glycosides, 100-101 enterolactone, 45-47, 50-51, 61, 69, cytokines, 30-33, 37-39, 54-55, 62-63, 82, 90, 93 69-70, 72-73, 95, 97, 111-112 EPA, see eicosapentaenoic acid epidemiologic studies, 64, 66, 70-71, 78, 81, 83, 88, 103 Deficiency of ALA, 29, 39 ER, see estrogen receptor

essential fatty acids, 22-23, 41

DHA, see docosahexaenoic acid

estradiol, 44, 50, 52, 76-77 protein, 7, 10-11, 15, 18-20, 50, estrogen receptor (ER), 44, 50-51, 56, 69, 75, 96, 101 74-76, 94 proximate composition, 11 estrone, 76-77 stability, 21, 105, 107 storing, 21, 105, 107 varieties, 10, 14, 20 Family Heart Study, 65, 67-68 yellow, 9-10, 15, 20 fatty acids, flow-mediated vasodilation, 59 essential, 13, 22-23, 39, 41 FMD, see flow-mediated vasodilation food sources of, 12 food allergy, 102 intakes of, 27, 35 functional fibre, 16 monounsaturated, 12-13, 20, 25, 59 polyunsaturated, 7, 12-13, 20, Gamma-tocopherol, 18 26-27, 33, 41, 106 gene expression, 22, 36, 50, 53, 71 ratio of omega-6 to omega-3, 34, gluten, 15-16 36-37, 41, 91 goiter, 101 saturated, 12-14, 20, 25-27, 34, 52, 93 trans, 27, 65-67, 106 Health Canada, unsaturated, 13, 22 flax use in foods, 108 fibre, see dietary fibre labeling, 109 fish, 34-35, 39, 41-43, 65, 67, 90, Health Professionals Follow-up Study, 93, 99 65, 68, 88-89, 91-92 flavonoids, 17, 44 hemostasis, 53, 55, 61-62, 69 flax, homeostasis, 53, 55, 69 ALA content, 7, 9, 11,13 hormone metabolism, 52, 92 anticancer effects, 73, 94 hormones, 44, 51-52, 72, 74, 82, 92, botanical name, 9 94, 98 brown, 9-10, 15, 20 hormone receptors, 51, 81 cancer prevention diet, and, 94 in men, 52 colour, 9, 14, 20 in women, 27, 44, 52, 74, 98 composition, 10 cooking, 101, 105-106 daily intake, 103 **I**HD, see ischemic heart disease lignan/SDG complex from flax, infant formula, 41 46, 57, 59-60 inflammation, 8, 17, 22, 30-33, oil, 36-39, 53-55, 57, 62-63, 70, 91-92, cardioprotective effects, 57 97, 111 composition, 14 inflammatory agents, 69, 111

inflammatory compounds, 38, 55, excretion, 46, 82 62-63 in flax, 47-49, 71 intakes, in food, 49 mammalian, 45-47, 50-51, 81, ALA, 39-40, 103-104 flax, daily, 103 90, 93-94 flax oil, 104 metabolism, 45-47, 51, 69, 76 children, 104 lignins, 16, 44 milled, 103 linoleic acid (LA), 12-14, 20, 22-24, omega-3 fat, 7, 35-36, 39-41, 35, 74, 83, 87, 89, 99 65, 99 linseed, 10 omega-6 fat, 34-35, 39-40, 99 lipid oxidation, 61, 69-70 interleukin-1\beta, 30, 62, 112 lupus, 32, 55-56, 58, 62, 97 ischemic heart disease (IHD), 53, Lyon Diet Heart Study, 64, 66, 74 61, 64, 66-67, 70 isolariciresinol, 45 Mammalian lignans, 45-47, 50-51, 81, 90, 93-94 matairesinol, 45-48, 68 Ketone body formation, 23, 25-26 membrane phospholipids, 26, 28-29, kidney disease, 29, 97 38 menopause, 98 metastasis, 72-76, 78, 81, 94 LA, see linoleic acid minerals, 18-19, 93 labels, 7, 16, 109-110 mucilage, 16, 96 lariciresinol, 45-48 laxation, 17, 97-98 leukotriene B₄, 62 Nurses' Health Study, 65, 67-68 lignans, nutrient antagonists, 102 anticancer, 50, 81, 90 antioxidants, 44, 50-51, 60, 74, 94, 106 Omega-3 fatty acids, aromatase, 51, 94 biologic effects, 29 as phenolics, 17 food sources, 12, 39, 42-43 biologic effects, 50-51, 81 health consequences, 34, 38 breast cancer risk, and, 50-51, in modern diet, 34-35 81, 94 in Paleolithic diet, 34 cancer risk, and, 50, 81-82, 90, infants, 41 93-94 intake, 35 cardioprotective effect, 69 label, 7, 109-110 cardiovascular disease risk, and, metabolism, 23, 28 64, 68-69, 71 nutrient content claim, 7, 109 conversion to mammalian lignans, ratio, n-6/n-3 fatty acids, 36-39 45-46, 93 recommended dietary intakes, 39

omega-3-enriched eggs, 8, 12, 36, 42-43
omega-6 fatty acids, food sources, 12
health consequences, 38
in modern diet, 34-35
in Paleolithic diet, 34-35
metabolism, 26, 28
ratio, n-6/n-3 fatty acids, 36
osteoporosis, 37, 50, 95
oxalate, 102
oxidation, 18, 60-61, 69-70, 77, 105-106
oxidative stress, 50, 53-55, 60-61, 70, 97

PAF, see platelet-activating factor Paleolithic diet, 34 phenolics, 17 phenolic acid, 17 phospholipids, 23, 26-29, 38, 65, 86-87, 92, 99 phytic acid, 102 phytochemicals, 7, 16 phytoestrogens, 44-45, 50, 74, 90, 95 pinoresinol, 45-48 plant lignans, 45-47, 51, 69, 93 platelet aggregation, 32, 54, 61-62, 70, 112 platelet-activating factor, 32, 62, 97 pregnancy, 25, 27, 33, 72 prostate cancer, 50, 55, 78, 82-93 ALA, and, 83, 93 prostate-specific antigen, 82, 85 protein, 7, 10-11, 14-15, 18-20, 22, 32, 37-39, 50, 54-56, 61, 63, 66, 69-70, 75, 96, 101, 111-112

PSA, see prostate-specific antigen

Ratio, n-6/n-3 fatty acids, 36 resolvins, 31-33

SAC, *see* systemic arterial compliance safety, of flax, 100, 108 SDG, *see* secoisolariciresinol diglucoside SECO, *see* secoisolariciresinol secoisolariciresinol diglucoside, 17, 45-46, 48, 57, 73-74 stability, 107 secoisolariciresinol, 45, 46-48, 51, 106 sex hormones, 27, 44, 51-52, 74, 82 solin oil, 13-14, 109 stroke, 29, 53-55, 64-65, 70, 93, 95, 111 systemic arterial compliance, 59

Tamoxifen, 75, 81 thiocyanate, 100-101 thrombosis, 28, 61-62, 112 thromboxanes, 62, 112 tocopherol, 18, 66, 87 *trans* fatty acids, 27, 65-67, 106 tumor necrosis factor α, 30, 62, 95, 112 tumour, 51, 73-76, 78-79, 81-84, 86, 90-91, 94, 101

United States,

Department of Agriculture's nutrient database, 21
Dietary Guidelines for Americans, 7
Institute of Medicine, 36, 39-40

Vascular cell adhesion molecule type 1, 60, 111

VCAM-1, see vascular cell adhesion molecule type 1

vegetable oils, 12, 14, 34, 36, 56, 59, 93

vegetarian, 42, 74, 91-92

nutrition, 99

vitamins,

in flax, 18

vitamin E, 18, 51, 60, 87, 106

vitamin K, 18-19

Women's Health Study, 36-37

Zutphen Elderly Study, 65, 67-68