

INDEX OF SUBJECTS

- acetate utilization in rumen 294
- acetylcholine
 effect on growth hormone secretion 150
 mediation of gastric secretion 230
- acids
 effects on gastric emptying 243
 gastric secretion, factors affecting 230–234
- acute-phase protein synthesis induced by cytokines
 amino acid composition during inflammation 202
 effect of copper deficiency on caeruloplasmin level 204
 effects of interleukins 196
 effect of protein-energy malnutrition 201
 effect of zinc deficiency on metallothionein synthesis 204
 nutritional implications 195
- adipose tissue *see also* lipids
 effects of cytokines and catecholamines on lipolysis 196
- adrenalin *see also* catecholamines
 secretion due to inflammation
 effects on immune system 197
- aflatoxin in weaning foods 42
- alanine
 effects of dietary deficiency in inflammatory states 201–202
- albumin in parenteral nutrition
 aluminium intake 122, 123, 131
- alcohol intake, relation to oesophageal cancer 78
- aluminium, human toxicity, nutritional aspects 117–135
 blood concentration 118
 body pools 123
 bone disease
 low-turnover 128–129
 osteopenic 131–132
 bone formation 121–122, 128–132
 brain effects 126–127, 130–131
 cholestasis 132–133
 contamination in parenteral sources 123
 excretion rate 118
 excretion routes 120–121
 infant formulas 133–134
 intestinal absorption 119–120, 129, 130
 intake via gastrointestinal tract 117, 119–120
 kidney accumulation 124, 126
 liver accumulation 120, 122–125, 132–133
 mineral interactions in intestines 119–120
 neurodegenerative diseases 126–127, 130–131
 parenteral nutrition 122–125
 tissue accumulation 121 132
- Alzheimer's disease *see* dementia
- amino acids *see also* aluminium, contamination in parenteral sources
 effect on gastric acid secretion 231, 233
 effect on gastric emptying 244
 intake
 effects on cytokines 201–204
 effect on protein synthesis 218–220
 requirements of rumen microbes 283–285
 supplements for weaning foods 36–38
 utilization as fuel in restricted dietary energy intake 63
- γ -aminobutyric acid
 effect on growth hormone secretion 150
- ammonia requirements of rumen microbes 281
- amylase
 activity in weanlings 29–30
 starch breakdown in weaning foods 42
- amyotrophic lateral sclerosis *see* dementia
- anaemia, iron deficiency in children 3–7
- androgens
 effect on growth hormone secretion 149–150
- androstenedione and ovulation in livestock 259
- anorexia
 effects of cytokines 197
 effect on growth hormone secretion 152–153
- antacids and aluminium intake 119, 121
 effect of citrate on intestinal absorption 119, 122, 129
- antioxidants
 protein-energy malnutrition
 free radical prevention 28–29
 relation to carcinogenesis 87–94
- arachidonic acid
 effects of dietary fish oils 200
 effect on membrane structure and carcinogenesis 84
- arginine
 effect on growth hormone secretion 148, 152
 effect of intake on protein metabolism 219–220
- bacteria, rumen *see* microbes, rumen
- basal metabolic rate *see* metabolism
- beverages
 effects on gastric acid secretion 233–234
- bicarbonate secretion
 gastric, factors affecting 234
- bile
 aluminium excretion 120–121
 effects of parenteral aluminium 121, 125, 133
- biotin
 effect of intake on ovulation in livestock 258
- bladder cancer
 effects of carotenoids and retinoids 90
- blood aluminium levels
 enteral nutrition 118, 122–123
 parenteral nutrition 121–123
- blood–brain barrier
 effect of aluminium on permeability 127
- body composition
 effect of growth hormone 166–169
 relation to puberty in livestock 254–255

- bone
 aluminium deposits 121–122, 128–132
 effect of growth hormone 173, 177
 effect of insulin-like growth factor 173, 177
 effect of salt intake
 man 109–110
 rat 102–103
 low-turnover disease, aluminium effects 128–129
 osteopenia, aluminium effects 131–132
- brain
 aluminium levels 120, 122
 effects of aluminium 126–127, 130–131
- breast cancer, effect of vitamin E 90
- breast-feeding and infant health 29–34
- burn injury, effects of dietary fish oils 199
- C-reactive protein *see* acute-phase protein synthesis
- caeruloplasmin *see* acute-phase protein synthesis
- caffeine intake
 effect on urinary calcium in man 105
- calcium *see also* aluminium, contamination in
 parenteral sources
 aluminium content in salts 123
 aluminium interactions
 effects on bone 128–129, 131–132
 effects on brain 126–127
- balance
 effect of sodium intake 101–112
 effect of salt supplement in rat 101–104
 effects on gastric emptying 242, 243
 intake, effect on fetal growth in livestock 263
 urinary, relation with urinary sodium 101, 104–110
- calmodulin, aluminium-binding in brain 126
- cancer and nutrition 75–94
- carbohydrates
 digestion in stomach 237
 gastric acid secretion, effect of intake 233
 glucagon secretion, effect of intake 60
 growth hormone action, effect of intake 169
 growth hormone secretion, effect of intake 61
 metabolic rate, effect of intake 69
 metabolism, effects of cytokines 196
 thyroid hormone secretion, effect of intake 55–56
- β -carotene
 effect of intake on reproduction in cattle 259
- carotenoids, relation to cancer 88–90, 92
- casein hydrolysates in parenteral nutrition
 aluminium intake 122–123, 128, 132
- catecholamines
 adipose tissue lipolysis 196
 effects of cytokines 196
 effect on metabolic rate in energy restriction 52–55, 59, 65–66
 interactions with thyroid hormones 57–59
- central nervous system, effects of cytokines 197
- chickens, protein turnover 211–225
- child malnutrition
 behaviour, effect on 1–19
 mental development, effect on 1–19
 missing breakfast studies 8–10
- cholestasis
 effect of parenteral aluminium 125, 132–133
- citrate intake
 effect on intestinal absorption of aluminium 119, 122, 129
- clonidine, effect on growth hormone secretion 150
- coconut oil, dietary
 effect on tissue responses to tumour necrosis factor 200
- cold stress
 effect on ruminant feed requirements 289–298
- colostrum in livestock
 effect on neonatal viability 265
 effect of nutrition 263–264
- connective tissue
 effects of cytokines on remodelling 196
 effect of growth hormone 171
 nutritional implications 195
- copper
 deficiency effects 204
 tissue redistribution
 effects of dietary amino acids 202
 effects of cytokines 196
- corticotrophin-releasing factor
 anorexia, effect on 197
 cytokine production, effect on 197
 fever induced 197
 metabolic effects of cytokines 198
 secretion, effect of cytokines on 197
- cortisol *see also* glucocorticoids
 secretion due to inflammation
 effects on immune system 197
- creatinine
 relation to sodium and calcium in urine 105, 108, 111
- cretinism, iodine deficiency in children 3
- cyclic adenosine monophosphate (cAMP)
 effect of salt supplement 103, 110
- cyclohexamide, fever blocked 197
- cyclo-oxygenase inhibitors, fever blocked 197
- cysteine
 amino acid interactions 202
 effect of inflammation on requirement 201–202
- cystine, effect of intake on protein metabolism 220
- cytochrome P450 in liver, effect of aluminium 125
- cytokines
 amino acids, effects of intake 201–205
 anorexia 197
 appetite centre, effects on 197
 central nervous system, effects on 197
 cytokine production, effects on 194
 fats, effects of intake 199–200
 inflammation, effects on 194
 inhibitory proteins, effects on synthesis 199
 lethal high doses 198
 lipoprotein lipase in adipose tissue, effect on 196
 minerals, effects of intake 204
 nutrition and 193–206
 production, regulation of 198
 proteins, effects of intake 201
 receptor down-regulation 199
 vitamins, effects of intake 205
- dementia, effects of aluminium 126–127, 130–131
- dexamethasone *see* glucocorticoids

- diabetes
 - effects of growth hormone and insulin-like growth factor 179–180
 - effect on growth hormone secretion 153–154
- dietary survey data and protein-energy malnutrition 26–29
- distension, gastric
 - effect on acid secretion 230–232
- L-dopa
 - effect on energy metabolism 54
 - effect on thyroid hormones 58
- dopamine, effect on growth hormone secretion 150

- eicosapentaenoic acid
 - dietary fish oil content 199
 - cytokine production, effects on 200
 - rheumatoid arthritis and psoriasis, effects on 199
 - membrane structure and carcinogenesis, effect on 80–81
- embryo survival
 - effect of nutrition in livestock 259–261
- encephalopathy
 - aluminium effects 126, 130–131, 133
- endotoxin *see* lipopolysaccharide endotoxin
- energy
 - content of meals, effect on gastric emptying 245–246
 - content of weaning foods
 - effect on protein-energy malnutrition 25–45
- energy intake
 - livestock effects
 - colostrum supply and composition 263–264
 - fetal growth 261–262
 - parturition-to-rebreeding interval 265–268
 - metabolic rates, effect of restriction 49–69
 - relation to breast and colon cancers 80–83
 - whole body protein synthesis, effect on 213–218
 - enzyme treatment in preparation of weaning foods 42
 - Escherichia coli* contamination of weaning foods 32
 - extrusion cooking of weaning foods 43
- fasting, effect on growth hormone secretion 152–153
- fasting and refeeding
 - effects on protein turnover 220–224
- fats
 - content in weaning foods 40–41
 - dietary effects
 - cytokine production 199–200
 - inflammatory changes 199
 - ovulation in livestock 257
 - puberty in livestock 254–255
 - relation to breast and colon cancers 78–86
- fatty acids
 - effect on growth hormone secretion 148–152
 - essential
 - effect on membranes 84
 - relation to breast cancer 78
 - free, metabolism in energy restriction 62–63, 65
 - non-esterified
 - effects of nutrition and growth hormone 170
 - polyunsaturated, as supplements in weaning foods 41
 - volatile, rumen metabolism 284
- feed utilization efficiency by ruminants 277–299
 - effect of climate 289–298
 - effect of rumen protozoa 286–288
- feeding frequency for weanlings 33–34
- fermentation in preparation of weaning foods 42–43
- fertilization
 - effect of nutrition in livestock 259–261
- fetus, growth
 - effect of nutrition in livestock 261–263
- fever
 - effects of cytokines 196, 197
 - nutritional implications 195
- fibre
 - digestion by ruminants
 - relation with sugar and starch intakes 281–282
 - intake
 - effects on urinary sodium and potassium in man 105
 - relation to colon cancer 78
 - weaning foods 41
- fish oils, dietary
 - effects on burns injury 199
- eicosapentaenoic acid source 199
- protection against lipopolysaccharide endotoxin 199
- folic acid, effect on embryo survival in pigs 260
- follicle-stimulating hormone
 - effect of nutrition in lamb 256
 - effect on ovulation in livestock 258
- foods, whole, effects on gastric acid secretion 234
- forage, fresh green
 - supplement to straw-based diet for ruminants 285
- forages, poor quality
 - utilization by ruminants 277–299
- free radicals
 - carcinogenesis 89
 - effects of diet 28
- fruit intake and gastric cancer 78

- garlic oil, protection against stomach cancer 89
- gastric emptying 238–246
 - factors affecting 240–246
 - measurement 239–240
- gastric secretions
 - factors affecting 230–236
 - volume 236–237
- gastrin
 - effect on gastric emptying of larger food particles 239
 - effect on pepsinogen secretion 235
 - factors affecting 231, 233
 - mediation of gastric acid secretion 230–231
- germination of seeds for weaning foods 42
- glucagon
 - effects of cytokines on secretion 196
 - effect on metabolic rate in energy restriction 60, 64
 - effect on immune system 197
- glucocorticoids
 - effects of cytokines 196

- glucocorticoids (*cont.*)
 effects in energy restriction 62, 64
 effect on growth hormone secretion 149
 inhibition of cytokine production 198
- gluconeogenesis
 enhancement by cytokines 196
- glucose
 effects on gastric acid secretion 231, 233
 effect of growth hormone on metabolism 170–172
 effect on growth hormone secretion 148, 150–153
 intake, effect on ovulation in livestock 258
 metabolism during energy restriction 62, 64
- glutamine
 effect of lipopolysaccharide endotoxin 205
- glycine
 amino acid interactions 202
 effect of inflammation on requirement 201–203
- goitre, iodine deficiency in children 3
- gonadotrophin-releasing hormone in livestock
 effect of nutrition on secretion during growth 256
 post-partum changes 267–268
- growth
 effect of growth hormone 166–169, 174
 effect of insulin-like growth factor 178
 standards for infants 29
- growth hormone
 binding proteins 174–175
 control sites 164
 effect in catabolic states 153–155
 effect of nutrition 151–155
 effects of *see* body composition, bone, connective tissues, diabetes, glucose metabolism, growth, growth hormone, insulin, lactation, lipid metabolism, metabolism, milk yield and composition, muscle, nutrient partitioning, obesity, ovary, protein metabolism
 functions 164–166, 173–183
 insulin-like growth factors 173–174, 177–180
 nutritional regulation of actions 164–183
 receptors 174–177
 secretion, factors affecting *see* acetylcholine, γ -aminobutyric acid, androgens, anorexia, arginine, clonidine, diabetes, dopamine, fasting, fatty acids, glucocorticoids, glucose, histamine, histidine, insulin, lysine, oestrogens, protein-energy malnutrition, steroids, thyroid hormones
 secretion regulation 145–150
- growth hormone releasing hormone
 relations with growth hormone 144 153
- guar gum *see* polysaccharides, non-starch
- gut immaturity in weanlings 32
- haemodialysis, aluminium intake 122
- heat stress
 effect on ruminant feed requirements 290–293
- heparin in parenteral nutrition
 aluminium intake 122, 123, 131
- histamine
 effect on growth hormone secretion 150
 mediation of gastric acid secretion 230
- histidine
 effect on growth hormone secretion 152
 effect of intake on protein metabolism 219
- β -hydroxybutyrate
 effect of infusion on protein synthesis 222
- hydroxyproline *see* sodium
- hypoglycaemia *see* glucose
- IGF *see* insulin-like growth factors
- immune system, effects of cytokines 193–206
- infant formulas, aluminium toxicity 133–134
- infants, feeding practices in Third World 32–35
- infections and weaning foods 31–32
- inflammation
 catabolic counter-regulatory hormones
 effect on secretion 197
 cytokine synthesis 193–194
 growth hormone secretion and immune system
 effect on 147
 metabolic effects 195, 202
 nutritional implications 195
 specific amino acids
 effect on requirement 201–203
- insulin
 cytokines, effects on 196
 fetal secretion and neonatal viability 265
 growth hormone, effect of 170–172
 growth hormone secretion
 effect on 147–148, 150–151, 153–154
 metabolic rate in energy restriction
 effect on 58–59, 64–66
 ovulation in livestock, effect on 258–259
 protein degradation, effect on 222
 relation to insulin-like growth factors 177, 180
 secretion inhibited by somatostatin 147
- insulin-like growth factors
 binding proteins 180–181
 bone, effect on 173, 177
 growth hormone, relations with 173–174, 177–180
 nutrition, effect on 182–183
 metabolism 143–145, 147–149, 151–155
 ovulation in livestock 259
 physiological effects 177–180
 receptors 181
- interferons *see* cytokines
- interleukins *see* cytokines
- iodine, effects of intake
 children 3
 fetal growth in livestock 263
 thyroid cancer 93
- iron
 children, effect of intake in 3–7
 inflammation, effect of intake on 204
 requirements of infants 28
 tissue redistribution
 effects of dietary amino acids 202
 effects of cytokines 196
- isoleucine, effect of intake on parasitaemia 203
- keto acids
 metabolism during energy restriction 62, 64
- kidney
 aluminium accumulation
 parenteral nutrition 124, 126
 effects on plasma sodium and calcium 102
- kwashiorkor *see* protein-energy malnutrition

- lactation
 effect of growth hormone 169–170
 effect of insulin-like growth factor 179
- leucine, intake effects
 parasitaemia 203
 protein metabolism 219
- leukotrienes
 effect on cytokine production 200
 effect of dietary lipids on production 200
- linoleate intake
 effect on membrane structure and carcinogenesis 84
- lipids
 cytokines, effects on metabolism 196
 digestion in stomach 237–238
 gastric acid secretion, effects on 231, 233
 gastric emptying, effects on 243
 growth hormone
 effects on metabolism 167–170, 172–173
- lipopolysaccharide endotoxin
 effect on muscle protein synthesis 205
- liquids, emptying of stomach 238
- liver
 aluminium accumulation
 enteral nutrition 120–122
 parenteral nutrition 124–125, 132–133
 effect of starvation on protein synthesis, chicken 223
- lung cancer
 effect of carotene and vitamin A intake 78, 88–89
 effect of vitamin C intake 88–89
- lupin grain
 effect on ovulation in livestock 257–258
- luteinizing hormone in livestock
 effect of molybdenum on secretion 255
 effect of nutrition on secretion 258
 at puberty 256
 post-partum changes 267–268
- lysine
 growth hormone secretion, effect on 152
 inflammation, effect of intake 202
 ovulation in livestock, effect of intake 257
 protein metabolism, effect of intake 219
- 'macrobiotic' diets for weanlings 35–36
- magnesium
 bone content, effect of salt supplement in rat 104
 requirements of rumen microbes 281
- maize oil, dietary
 effects on tissue responses to tumour necrosis factor 200
- mammary gland
 effect of starvation on protein synthesis 223–224
- mammogenesis, effect of nutrition in livestock 263–264
- marasmus *see* protein-energy malnutrition
- membrane fatty acids
 effect of changes on cancer incidence 84–86
- mental development
 effect of nutritional deficiencies in children 1–19
- metabolism
 chronic energy deficit, effect on efficiency 65–68
 energy restriction, effect on rate 49–69
 growth hormone, effect in energy restriction 60–61
 metabolizable energy intake
 as predictor of feed utilization efficiency in ruminants 294–298
 metallothionein *see* acute-phase protein synthesis
 metals *see* aluminium, contamination in parenteral sources
 methionine
 amino acid interactions 202
 effect of intake on protein metabolism 219–220
 requirement in inflammatory states 202
- microbes
 digestion in non-ruminant digestive tract 238
 rumen, requirements for optimum performance 280–285
- milk
 aluminium content after subcutaneous injection, rabbit 124
 energy source for infants 29–30
 yield and composition
 effect of growth hormone 169–170
 effect of insulin-like growth factor 179
- minerals
 interactions with aluminium in intestine 119–120
- molasses/urea licks in ruminant nutrition 283
- molybdenum
 effect on luteinizing hormone secretion in livestock 255
- mucus secretion, gastric 236
- muscle, effect of growth hormone 171
- neonate
 chymosin secretion 235
 gastric acid secretion 231
 pepsin secretion 235
 viability, effect of nutrition in livestock 264–265
- neurodegenerative diseases
 aluminium effects 126–127, 130–131
- neurofibrillary tangles
 effect of aluminium 126–127, 130
- nervous system *see* central nervous system, sympathetic nervous system
- nitrites and nitrites
 relation of intake to gastric cancer 78
- nitrogen requirements of rumen microbes 283–284, 291–292
- noradrenaline *see* catecholamines
- nutrient partitioning
 effect of growth hormone 170, 172
- obesity
 effect of growth hormone 152, 166
 effect on growth hormone secretion 152
 relation to cancer 81–83
- oesophageal cancer
 alcohol intake 78
 retinol level 89
- oestradiol, effect of insulin infusion in pigs 259
- oestrogens
 effect of fat intake on synthesis 83
 effect on growth hormone secretion 149–150
 relation of synthesis to cancer 82–83
- oil supplement for weaning foods 40–41

- olfactory pathway to brain for aluminium 127
- osmolarity of digesta
effect on gastric emptying 242–243
- osteocalcin, indicator of bone turnover 112
- osteomalacia
effects of aluminium 125, 128–129, 132
effects of phosphate 122
- osteopenia, effects of aluminium 131–132
- osteoporosis
effects of dietary sodium and calcium 101–112
- ovary, effect of growth hormone in livestock 259
- oviduct
effect of starvation on protein synthesis in chicken 223
- ovulation, effect of nutrition in livestock 257–259
- parathyroid gland
aluminium levels in parenteral nutrition 122, 124
- parathyroid hormone
absorption and tissue stores of aluminium
effect on 119, 132
aluminium, effect of 125, 128–131
calcium metabolism in man, effect on 108–110
sodium intake in man, effect of 108
urinary hydroxyproline after salt supplement
effect in rat 103
- parenteral nutrition
aluminium intake 122–125
aluminium toxicity in infants 131–132
- Parkinsonism *see* dementia
- particle size of digesta
effect on gastric emptying 238–239, 241
- parturition-to-rebreeding interval
effect of nutrition in livestock 265–267
- peanut butter as supplement for weaning foods 41
- PEM *see* protein–energy malnutrition
- pepsin and pepsinogen
gastric secretion 234–236
neonates 235
pigs, growing 235–236
- peptides, requirements of rumen microbes 283–285
- phosphates *see also* aluminium, contamination in parenteral sources
effect of intake on osteopenia in infants 131
- phosphoinositides, membrane
relation to carcinogenesis 85
- phosphoinositol
effect of lipopolysaccharide endotoxin in rats 200
- phospholipids, membrane
effects of dietary fats 200
- phosphorus
bone, effect of salt supplement in rat 104
effects of intake on urinary sodium and potassium in man 105
requirements of rumen microbes 280–281
- plasma *see* blood
- polysaccharides, non-starch
effects on gastric emptying 241–242, 245
- progesterone
effect on metabolic rate in energy restriction 61–62
effect of nutrition on levels in livestock 260
- prolactin secretion, effect of fat intake 83–84
- prostaglandins
cytokine production, effect on 198–200
fatty acid precursors 80–81
membrane structure and carcinogenesis
effect on 84–85
synthesis
effects of cytokines 196
effects of dietary fat 200
- prostate cancer
effect of carotenoids and vitamin A 90
effect of vitamin C 90
- protein–energy malnutrition
effect on cytokines 201
effect on growth hormone secretion 153–155
effect of weaning foods 25–45
in children
acute behavioural effects 110–111
long term effects 111–118
preventive studies 115–118
rehabilitation studies 112–113
- protein–energy ratio for weanlings 36
- protein intake
cytokines, effects on 201–203
livestock, effects in
colostrum supply and composition 263–264
embryo survival 259–261
fetal growth 262
ovulation 257–258
parturition-to-rebreeding interval 265–267
puberty 255–256
- man
effects on urinary sodium and potassium 105, 107
effect on whole body protein synthesis 213–225
- proteins
availability to ruminants
effect of protozoa in rumen 286–288
binding
growth hormone 174–175
insulin-like growth factor 180–181
catabolism, effect of restricted energy intake 63
content in weaning foods 36–38
degradation, dietary effects 219–220, 222–223
digestion in stomach 237
gastric acid secretion, effects on 232–233
gastric emptying, effects on 244
inhibitory, effects of cytokines on synthesis 199
loss from muscle, effects of cytokines 196
metabolism, effect of growth hormone 166–171
requirements of infants 27
during weaning 30–31
synthesis
nutrient requirements 213–220
in stomach of pigs 236
turnover in chickens and mammals 211–225
comparative findings 224
effect of protein depletion and repletion in chickens 221–223
- protozoa, effect on ruminant digestion 286–288
- puberty, effect of nutrition in livestock 254–256
- receptors for
growth hormone 174–177
effect of nutrition 176
insulin-like growth factor 181

- reproduction in livestock
 nutritional effects 253–268
- resting metabolic rate *see* metabolism
- retinoids
 epithelial cells protected 77, 91–92
 relation to cancer 78, 88–92
- reverse triiodothyronine (rT_3) *see* thyroid hormones
- riboflavin, effect on embryo survival in pigs 260
- roughages, poor quality
 utilization by ruminants 277–299
- rumen microbes, nutrient requirements *see* ammonia,
 amino acids, magnesium, nitrogen, peptides,
 phosphorus, sulphur
- ruminants
 digestion of forage and poor-quality fibre
 281–284
 effect of starches and sugars 281–282
 effect of rumen protozoa 286–288
 feed utilization efficiency 277–299
 effect of climate 289–298
 effect of rumen protozoa 286–288
 metabolizable energy intake 294–298
- safflower oil, dietary
 effects in burn injury to guinea-pigs 199
- salt/urea licks in ruminant nutrition 283
- seed germination for weaning foods 42
- seizures, brain, effect of aluminium 126–127
- selenium, effects of intake in livestock 265
 neonatal immunity 265
 neonatal viability 264
 protection against cancer 92
 reproduction 259
- serine
 amino acid interactions 202
 effect of inflammation on requirement 201–202
- Shohl's solution
 effect on aluminium absorption 122, 129
- silicon
 effect of intake on aluminium level in brain 120,
 126
- sleep and growth hormone release 145, 148
- sodium, dietary effects
 bone in rat 104
 calcium balance 101–112
 urinary calcium 102
 urinary hydroxyproline 103, 111–112
 effects on bone metabolism and osteoporosis in
 man 111–112
- sodium, urinary, relation with calcium excretion 103
- somatomedins *see* insulin-like growth factors
- somatostatin relations
 growth hormone and growth hormone releasing
 hormone 144–147, 149–153
- sorghum gruels, effect of germination 41–42
- sperm production at puberty
 effect of nutrition in livestock 255–256
- spleen
 aluminium accumulation in parenteral nutrition
 124
- starches
 effect on fibre digestion in ruminant feeds 281–282
 effect on gastric emptying 245
 weaning diets 29–30, 35, 38–39
- steroids
 effect of fat intake on metabolism 83–84
 effect on growth hormone secretion 149–150
- stomach *see also* gastric emptying, gastric secretions
 cancer
 effect of allium foods 89
 effect of vitamin C 89
 nutritional regulation of functions 229–246
- straw-based diets for ruminants
 value of fresh green forage supplement 285
- strontium absorption
 effect of sodium intake in man 110
- sugars
 effect on fibre digestion in ruminant feeds 281–
 282
 effect of gastric emptying 244–245
 supplement for weaning foods 40–41
- sulphur requirement of rumen microbes 280
- superoxide dismutase
 effect of copper deficiency 204
- sympathetic nervous system
 effect of insulin 58–59
 effect on metabolic rates in energy restriction
 52–55, 64
 effect on progesterone secretion 61
 effect of thyroid hormones 57–59
- tamoxifen
 oestrogen inhibitor in treatment of cancer 93
- taste in infants, effect on food acceptability 43
- thermogenesis, effect of energy restriction 49–69
- threonine intake
 amino acid interactions 202
 effect on parasitaemia 203
- thyroid hormones
 effect on growth hormone secretion 149–150
 effect on metabolic rates in energy restriction
 55–59, 64–66
 effect on protein catabolism 63
 interactions with catecholamines 57–58
 neonatal viability in livestock 264
- thyroid-stimulating hormone
 effect of energy restriction 57
- thyrotrophin releasing hormone
 effect of energy restriction 57
- thyroxine (T_4) *see* thyroid hormones
- triiodothyronine (T_3) *see* thyroid hormones
- total parenteral nutrition *see* parenteral nutrition
- transferrin in blood
 aluminium binding 123, 127
 effect of dietary safflower oil 199
- tumour necrosis factor *see* cytokines
- tyrosine, effect of supplement on puberty in pigs
 255
- urea, ruminal infusion to increase available ammonia
 281
- vaccinations as source of aluminium intake 124
- valine intake
 effect in parasitaemia 203
 effect on protein synthesis 219
- viscosity of digesta
 effect on gastric emptying 241–242

- vitamin A *see also* retinoids
 - effects of intake
 - interleukin production 205
 - protein–energy malnutrition 28–29
 - puberty in livestock 255–256
- vitamin C, relation to cancer 78, 87–90
- vitamin D
 - effect on absorption and tissue stores of aluminium 119–120
 - effect of aluminium 125, 129
 - synthesis induced by parathyroid hormone in man 108–110
- vitamin E
 - effect of intake on cytokine production 205
 - effect of intake on neonatal immunity in livestock 265
 - relation to cancer 90, 92
- weaning, optimum age 29–33
- weaning foods 25–45
 - amino acid supplementation 36–38
 - energy density 25–45
 - fat content and composition 40–41
 - fermentation 42–43
 - fibre content 41
 - formulation 39–43
 - nutritive value 35–43
 - preparation 35
- xerophthalmia in children with vitamin A deficiency 29
- zinc
 - effect of intake on aluminium in brain 120, 126–127
 - effects of intake on livestock
 - fetal growth 263
 - ovulation 258
 - puberty 256
 - metallothionein production
 - effect of deficiency 204
 - requirements of infants 28
 - tissue redistribution
 - effects of dietary amino acids 202
 - effects of cytokines 196