

SUBJECT MATTER IN BRIEF

British Journal of Nutrition, Vol. 59, No. 3, May 1988

CLINICAL AND HUMAN NUTRITION papers

STUDIES IN MAN

Variation in breast-milk fat concentration. Energy intake of breast-fed infants depends on fat concentration and volume of breast-milk consumed. Investigation of variation in breast-milk composition showed that interfeed interval, feed volume, and fat concentration and volume of the previous feed predicted fat concentration of breast-feeds. Fat concentration also fluctuated significantly over 24 h.

349-363

24 h breast-milk fat concentration. Determination of energy intake from breast-milk requires accurate estimation of breast-milk fat concentration. Samples expressed before and after two daytime feeds (chosen using information on circadian variation in breast-milk composition) estimated mean 24 h fat concentration less accurately than sampling all daytime feeds.

365-371

Effect of a high-fat diet on GIP secretion. Dietary changes have been implicated in causing hyperinsulinaemia by stimulating the entero-insular axis. In the present study, a 35 d high-fat diet caused increased gastric inhibitory polypeptide (GIP) secretion and improved glucose tolerance in healthy volunteers. Insulin secretion was unchanged, in spite of the improvement in glucose tolerance.

373-380

OTHER STUDIES RELEVANT TO HUMAN NUTRITION

Riboflavin and iron absorption. Iron metabolism was examined in riboflavin-deficient and weight-matched control rats following an oral dose of ^{59}Fe . Riboflavin deficiency was associated with a reduction in percentage ^{59}Fe absorption and an increase in the subsequent rate of loss of ^{59}Fe .

381-387

Saponins and mineral absorption. In a previous study we found that a 'non-food' saponin, extracted from the roots of *Gypsophila* sp., reduced iron, but not zinc, status in rats. Results from the present study indicate that this was attributable to reduced Fe absorption, and that saponins found in foods may have a similar effect.

389-396

GENERAL NUTRITION papers

Diet-hormone interactions and muscle growth. Dietary protein stimulates muscle growth directly by increasing ribosome content and inhibiting proteolysis. It also exerts an indirect effect through its stimulation of insulin and 3,5,3'-triiodothyronine (T_3). These hormones in turn stimulated growth: insulin stimulating protein synthesis, particularly at low insulin levels, T_3 increasing RNA concentration. Both hormones stimulated proteolysis. 397-415

Effect of prostaglandins on zinc transport. Prostaglandins E_2 and $F_{2\alpha}$ were thought to be low-molecular-weight Zn-binding ligands facilitating intestinal Zn transport. However, the present study demonstrated that prostaglandins influence intestinal Zn transport not by chelating Zn and carrying it across the mucosal cell membrane, but by triggering a transduction mechanism. 417-428

Dynamics of protozoa in the rumen of cattle. In cattle fed on molasses-based diets with two levels of forage, protozoal pool and half-life in the rumen tended to be higher at the highest level of forage supplementation. 74% of protozoa were apparently retained and lysed in the rumen, thus decreasing the microbial biomass available for digestion. 429-436

Zinc and tumour growth control. The possibility of an effect of Zn on the rate of tumour cell division, mediated through a regulation of cellular cAMP concentration was investigated in rats. The results indicated that Zn had little effect in this way in the cell line used. 437-442

β -Carotene-rich alga as a source of retinol. *Dunaliella bardawil* may be used as a dietary source of β -carotene, a compound commonly used as a precursor of retinol in animal feed. A study in which preparations from this alga were given to retinol-deficient rats demonstrated that the animals' retinol requirement was fully satisfied by the supplements. 443-449

Cysteine, glutathione and thyroid hormones. Reduced glutathione is essential for maintaining normal thyroid hormone status. Hepatic glutathione concentrations were shown to decrease when a diet deficient in a sulphur amino acid, cysteine, was administered. This was accompanied by a reduction in the conversion of thyroxine (T_4) to the biologically potent 3,5,3'-triiodothyronine (T_3) 451-456

Clenbuterol in sheep. Certain β -agonists have been shown to produce leaner carcasses in farm species. In sheep the improvement in protein retention is probably related to decreases in whole-body protein breakdown. The decreased fat gain is a net result of diversion of nutrients to protein and an increase in energy expenditure. 457-465

Subject matter in brief

347

Casein and species-dependent cholesterolaemia. Primary and secondary features of casein-induced hypercholesterolaemia in rabbits were compared with those in rats. Species-dependent differences in activity of intestinal alkaline phosphatase and in glycine-*taurine* conjugation of bile acids may modulate the response to dietary casein. This may explain why this response is negligible in humans. 467–473

Branched-chain amino acid catabolism in lambs. Very low activity of branched-chain amino acid aminotransferase in lamb tissues and the activation state of branched-chain α -keto acid dehydrogenase in liver may contribute to the low rate of branched-chain amino acid catabolism. Dietary leucine excess increased these enzyme activities in jejunum and liver. 475–483

Folate transport in neonatal goats. Basic characteristics of intestinal folate transport were compared in enterocytes and brush-border-membrane vesicles. Folic acid and 5-methyltetrahydrofolate were transported by a single, carrier-mediated mechanism in both tissue samples, kinetic constants for transport being similar both for the two folates and between enterocytes and membrane vesicles. 485–495

Folate-binding protein and folate absorption. Folate-binding protein from goat's milk greatly enhanced folate transport across the brush-border membrane of the infant-goat small intestine. It is suggested that the protein has a role in the absorption of folate by the neonate before endogenous mechanisms become fully developed. 497–507

Vitamin E pharmacokinetics in sheep. A study on availability of various forms of vitamin E given orally to sheep showed higher plasma values for *D*- α -tocopherol than its *L*-epimer or ester forms. Intravenous studies in sheep also revealed that *D*- α -tocopheryl acetate dosing is a more efficient method of administration than equivalent *DL*- α -tocopheryl acetate or *DL*- α -tocopherol. 509–518

Prewaning nutrition and fat cell growth. Prewaning undernutrition retarded adipocyte growth in female mice and the effects required hyperphagia for reversal. In males, which were more developed, the smaller differences were corrected with time, suggesting that their appetite was less affected by litter size. In older mice, hyperplasia seemed to occur chronologically, unrelated to cell volume. 519–533

Dietary fish oil and mouse tissue lipids. A time-course dietary fish oil study showed that heart and brain phospholipid fatty acid composition can be significantly modified in a short period (1 week) of time. Modifications are maintained with continued fish oil consumption and are readily reversible upon cessation of fish oil ingestion. 535–545