642 PRECOCIOUS INCREASE OF SUCRASE ACTIVITY IN THE SMALL INTESTINE OF SUCKLING RATS BY CARBOHYDRATES: STRESSORY EFFECT OF SUGAR INDUCED DIARRHEA. Otakar Koldovský, Toshinao Goda, Sergio Bustamante, Judy Grimes, John Edmond. Departments of Pediatrics & Physiology, Univer. of Arizona College of Medicine, Tucson; and UCLA Department of Biological Chemistry, Los Angeles.

Increased intake of sucrose (S) is followed in adult and suckling rats by an increase of sucrase activity (SA). This study analyzes the increase of SA in suckling rats evoked by the early feeding of S and other sugars. Ten-day-old rats, removed from their mothers, were gavage fed for 4 days a low carbohydrate milk formula (MF), [10.8% fat, 8% protein, 1.4% carbohydrate-w/v], with or without addition(s) of lactose or fructose (FR), both 13%. Feeding the MF with FR led to diarrhea and an increase of SA. Gastric evacuation of MF with S or FR was significantly slower than MF low in carbohydrates or with lactose. When MF with S or FR were placed directly into the ligated jejunoileum in situ, net water absorption was decreased. Ten-day-old rats kept with the mother, and receiving twice daily 0.5 ml of 5% mannitol in water developed diarrhea within one day, and a marked increase of SA which gradually decreased after the 2nd day of mannitol feeding. Serum corticosterone level was highly increased 8 hrs after the initiation of the mannitol feeding or MF with S or FR. Our experiments thus explain the role of adrenals in increase of SA in sucklings. In contrast to adult rats, increase of SA in suckling rats by dietary sugars is mainly due to the stress caused by diarrhea that is evoked by undigested and/or unabsorbed amount of sugars.

● 643 PANCREATIC EXOCRINE FUNCTION IN ISLET CELL DYSPLASIA (ICD)AFTER 95% RESECTION. H.R.Kopelman, K.J. Gaskin, P.R.Durie, G. Sherwood, R.M. Filler, D.E. Wesson & G.G. Forstner. (Spon. by J.R. Hamilton). Hosp. for Sick Children, Depts of Ped & Surg, Toronto, Ontario, Canada.

Subtotal (95%) pancreatectomy has been advocated for hyperinsulinemic hypoglycemia unresponsive to medical therapy. We studied pancreatic exocrine function in infants with ICD before surgery, 1-2 mths after 95% resection of the pancreas (early po), and 1-2 yrs later (late po). We used a quantitative perfusion technique to collect duodenal secretions during pancreatic stimulation with IV secretin and CCK.

Results are expressed as mean units/kg/hr, mean mEq/kg/hr(HCO_3) and % of mean age-matched control values.

	Trypsin	Lipase	Colipase	HCO_3
pre-op (4)	786(42.9%)	2949(-)	2263(-)	0.25(61.0%)
early po (3)	369(21.8%)	1266(15.7%)	586(8.6%)	0.11(21.2%)
late po (3)	602(27.0%)	5192(25.9%)	3155(26.6%)	0.31(50.0%)

Pre-op mean trypsin and HCO_3 secretion was depressed in ICD during medical therapy. Despite 95% resection, all pts had sufficient pancreatic function to absorb fat normally. By 2 mths po, considerable residual secretory capacity was present. Further functional improvement had occurred 1-2 yrs later. One pt operated on for recurrent hypoglycemia had definite evidence of pancreatic regeneration 3 yrs after initial resection.

These pts demonstrate that infants may have significant potential to increase pancreatic exocrine secretory capacity after major resection, independent of developmental changes, presumably due to regenerative hyperplasia and/or hypertrophy.

644 PLASMA BENZOYL-TYROSYL-PABA TEST IN EVALUATING EXOCRINE PANCREATIC FUNCTION IN CF: A PHARMACOKINETIC APPROACH. Gideon Koren, Zvi Weizman, Gordon Forstner Peter Durie. Div. of Gastroenterology & Clin. Pharmacology, The Hospital for Sick Children, Toronto, Canada. (Spon. by S.MacLeod)

Following oral administration BT-PABA is selectively cleaved by pancreatic chymotrypsin liberating PABA which is passively absorbed, conjugated and excreted in the urine. Recently we have proposed that PABA measured in plasma 90 min after oral BT-PABA is superior to a 6 hr urine collection for determining pancreatic function in CF pts. However, this test assumes that the PABA marker has similar distribution and elimination patterns in normal and CF subjects. Since various drugs have altered pharmacokinetic patterns in CF, we studied the disposition of PABA in plasma and urine following oral BT-PABA and equimolar free PABA. The study group included six controls (age 19-28 yrs) and 18 CF pts (13-38 yrs; 7 steatorrheic and 11 non-steatorrheic). Following oral free PABA, elimination $T_{\frac{1}{2}}$ of PABA was significantly shorter in CF pts (58±21 min) as compared to controls (93.5±28) ($P < 0.005$). This change in $T_{\frac{1}{2}}$ could be correlated with lower PABA distribution volume ($r=0.51$, $P < 0.02$). PABA clearance was comparable between CF and control. In CF, mean plasma PABA values after free PABA were reduced by 7% at 90 min, 18% at 120 min and 38% at 180 min. Therefore, lowered plasma PABA may accentuate differences between normal and CF subjects following BT-PABA. This defect is minimized by taking plasma samples at 90 min rather than 180 min. Alterations of PABA kinetics in CF pts should be considered when interpreting the BT-PABA test.

645 GROWTH AND BONE MINERAL STATUS OF HEALTHY TERM INFANTS FED EITHER SOY BASED FORMULA WITH SUCROSE OR GLUCOSE POLYMER. Linda Leeper, Gary M. Chan, Linda Book, Jean Hollis, and Hal Drinkhaus (Spon. by M. Simmons). Dept. of Pediatrics, University of Utah, Salt Lake City, Utah.

Soy based formulas have been associated with rickets in infants. A possible contributing factor may be the lack of lactose. To study the effects of soy formulas containing either sucrose (S) or glucose polymer (G) on growth and bone mineral content (BMC), 17 term infants on soy formula containing S, 14 term infants on soy containing G and 23 term breast fed (BF) infants were followed. At 2 weeks, 2 months and 4 months of age, all infants were weighed and serum calcium (Ca), phosphorus (P), magnesium (Mg), 25-OH vitamin D, and alkaline phosphatase (AP) levels were drawn. BMC was also measured by photon absorptiometry at distal left radius. There were no differences among the 3 groups in weight gain, serum Ca, Mg, 25-OH D, and AP levels during the study. Serum P was lower in BF infants (5.0±1.2 mg/dl, M±SD) than the infants on S (8.0±1.5 mg/dl) or G 8.3±0.09) ($p<0.001$). At 2 weeks of age, there were no differences in BMC among the 3 groups. At 2 and 4 months of age, the BMC of S and G groups were lower than BF group ($p<0.001$):

	2M	4M
BF	94±28 mg/cm*	109±19*
S	74±18	77±23
G	66±16	61±25

The bone width of the measured bones were similar among the 3 groups. In conclusion, term infants on soy based formulas have lower bone mineral status than breast-fed infants. Carbohydrate source in the soy formula did not affect bone mineralization.

646 THE COMPOSITION OF PRETERM MILK IN RELATION TO THE DEGREE OF PREMATURITY. G. Lepage, S. Collet, D. Bouglé, L.C. Kien, D. Lepage, L. Dallaire, P. Darling and C.C. Roy. University of Montreal and the Medical College of Wisconsin, Hôpital Ste-Justine and the Milwaukee Children's Hospital, Depts of Pediatrics.

The effect of the stage of lactation on the composition of preterm milk has been closely monitored, but little attention has been given to the degree of prematurity. Fifty-six samples of 24 h milk collections obtained from mothers who delivered after gestations of 26-31 wk (VPT) contained higher concentrations of nitrogen (297 ± 11 mg/dl), total fatty acids (4.46 ± 1.7 g/dl), % medium chain fatty acids (10.8 ± 0.7) and energy (76.6 ± 2.0 kcal/dl) than either or both those from 32-36 wk (PT) and term (T) gestations. PT collections did not differ from T milk with regard to nitrogen (250 ± 13 vs 259 ± 13), total fatty acids (3.94 ± 2.0 vs 3.20 ± 3.0), % medium chain fatty acids (9.1 ± 0.5 vs 8.1 ± 0.7) and energy (68.2 ± 2.8 vs 65.3 ± 2.3). Although post-partum age (5-10 d vs 11-30 d) did not change the nutrient and energy content of VPT, PT and T collections, it is only in 11-20 d VPT milk that nitrogen and energy content became higher ($p<.05$) than either or both PT and T milk. Sequential milk collections over the first post-partum month from a mother having given birth at 28 weeks showed non parallel changes in nitrogen and fatty acids. We conclude that the nutrient advantage of preterm milk is largely limited to VPT milk and caution that there may be considerable variability in its composition.

647 INCREASED ANTIBODY LEVELS TO COW'S MILK PROTEINS IN CHILDREN WITH CHRONIC LIVER DISEASE. Aaron Lerner, Byung H. Park, Thomas M. Rossi, Emanuel Lebenthal. SUNY at Buffalo, Children's Hospital of Buffalo, Divisions of Gastroenterology and Immunology, Buffalo, New York.

The liver plays a major role in elimination of intestinal antigens by the immune system. In various liver diseases, such defense mechanisms may be affected and may lead to an increased uptake of dietary antigens which might stimulate the host immune response. Serum antibodies (IgG, M and A) to αcasein, bovine serum albumin (BSA), αlactalbumin, βlactoglobulin A (βLGA) and B (βLGB) were studied in 16 children with different liver diseases using ELISA. The antibody activity was expressed as the OD at 400 nM in serum dilution of 1:32. Results are presented as "liver diseases vs age matched controls". Below 1 year: IgA to αcasein (0.68±0.36 vs 0.29±0.4). 1-5 years: IgA to αcasein (1.01±0.47 vs 0.12±0.11), IgG to BSA (1.2±0.62 vs 0.4±0.49) to βLGA (1.23±0.39 vs 0.4±0.46) and to βLGB (1.33±0.42 vs 0.37±0.49). 5-11 years: IgM to αcasein (1.1±0.46 vs 0.49±0.4) IgA to αcasein (0.71±0.5 vs 0.13±0.11), IgM to BSA (0.97±0.39 vs 0.52±0.25). 11-20 years: IgG to BSA (1.14±0.28 vs 0.35±0.42). In liver disease, αcasein invoked mainly IgA response. BSA, βLGA and βLGB induce an increase of predominantly IgG levels. These data indicate that in chronic liver disease in children, there is a high level of specific antibodies to cow's milk proteins. It is possible that the failure of the hepatic reticulo endothelial system to clear the serum of these antigens and/or an IgA deficient bile that allows increased uptake of enteric antigens may explain the above observations.