SERUM LIPID COMPOSITION AND SUSCEPTIBILITY OF LIPOPROTEINS TO OXIDATION IN PATIENTS WITH STEATORRHEA AND VITAMIN E DEFICIENCY. A.H.J. Naber[1], H.A. Kleinveld[2], P.M.N. Demacker[2], J.B.M.J. Jansen[1], [1]Dept. of Gastrointestinal and Liver Diseases, [2]Dept. of Internal Medicine, University Hospital Nijmegen, P.O.Box 9101, 6500 HB Nijmegen, the Netherlands.

Patients with steatorrhea because of a gastrointestinal disease show a decrease in cholesterol uptake. Theoretically this would result in a decrease in risk of atherosclerosis. In these patients however, serum vitamin E is also decreased. Low-density lipoprotein oxidation results in its enhanced uptake by macrophages and may lead to subsequent foam cell formation, one of the first stages of atherosclerosis. Vitamin E is the major antioxidant in LDL and protects LDL from oxidation. Because of the decrease in vitamin E an increase in risk of atherosclerosis would be expected in these patients. These theories are contradictory. The lipid composition and susceptibility of lipoproteins to oxidation was studied in these patients. In ten patients with a pancreas insufficiency or short bowel syndrome in which a decrease in serum vitamin E concentration was found and in 23 healthy volunteers blood was taken. The composition of the lipids and of LDL together with the vitamin E content of LDL were determined. The LDL oxidizability was tested in a cell free system using copper as a pro-oxidant. The diene production as a measure for the lipid peroxidation can be divided in three phases: 1. a lag phase, 2. a propagation phase (rate) and 3. a decomposition phase (diene production).

Results (*** p<0.001)	Patients (n=10)	Controls (n=22)
Total cholesterol (mmol/L)	2.79	5.21 ***
LDL cholesterol (mmol/L)	1.27	3.53 ***
linoleic acid: 18:2 (%)	26.2	39.3 ***
oleic acid: 18:1 (%)	25.2	17.4 ***
Vitamin E in LDL (mg/mL)	2.29	4.3 ***
Lag time (min)	156	134 (N.S.)
Rate (nmol/min/mg LDL)	6.2	9.5 ***
Diene prod. (nmol/min/mg LDL)	379.4	554.6 ***

Conclusions: patients with steatorrhea and vitamin E deficiency demonstrate a low serum LDL and contrary to our expectation less susceptible to oxidation of LDL compares to controls, although the vitamin E content in LDL was decreased. Probably this is the result of an increase in oleic acid content.

COLONIC FERMENTATION OF RESISTANT STARCH (HYLON VII) MEASURED BY BREATH H_2 AND CH_4 EXCRETION. F.M. Nagengast[1], M. Jansen[3], H. de Boer[3], I.P. van Munster[1], T. de Haan[2], M.B. Katan[3]. [1]Dept of Gastroenterology and [2]Dept of Biostatistics, University Hospital Nijmegen and [3]Dept of Human Nutrition, Wageningen, The Netherlands.

The fraction of starch escaping digestion in the small bowel is called Resistant Starch (RS). In the large bowel this starch is fermented to short chain fatty acids and hydrogen (H_2) and methane (CH_4). To date no information is available on the difference in fermentation of readily digestible starch (RDS) compared to RS in man. We therefore studied the effect of uncooked, raw Hylon VII (63 % RS) and Cerestar (maltodextrin with no RS) on breath H_2 and CH_4 excretion in a controlled, cross-over designed experiment. **Methods:** in two periods of one week either 45 g (3 x 15g-/day) Hylon VII or Cerestar was randomly administered to 11 healthy methane producers (M^+) and 8 non-methane producers (M^-). Between the test periods one wash-out week was scheduled. Subjects were allowed to consume a low (15 -20 g/d) fiber, but otherwise normal Dutch diet. Compliance was checked with dietary diaries. On the last day of the test week 8 end-respiratory breath samples were collected every 2 hours for 16 hrs from 8 am untill 24 pm. Breath H_2 was measured by an electrochemical cel and CH_4 by gaschromatography. Areas under the curve were made for comparison. **Results:** the H_2 excretion rose significantly during Hylon VII, preferentially in M^- subjects. In M^+ subjects an increase in methane excretion was observed (table below).

Breath H_2 and CH_4 excretion during Hylon VII and Cerestar (mean ± SD)

Hydrogen	Hylon VII	Cerestar	delta H_2	p-value
M^-	612 ± 152	383 ± 195	230 ± 90	0.022
M^+	594 ± 337	488 ± 216	105 ± 110	0.193
M^-+M^+	599 ± 269	382 ± 195	155 ± 75	0.030
Methane	Hylon VII	Cerestar	delta CH_4	p-value
M^-	1.2 ± 1.5	3.8 ± 9.3	-2.6 ± 3.3	0.246
M^+	514 ± 368	267 ± 201	247 ± 119	0.030

Conclusions: these data indicate that Hylon VII, a highly resistant starch compound, produces more hydrogen and methane than a rapid digestable starch product. The effect on H_2 excretion is preferentially observed in non-methane producers. Methane producers excreted significant amounts of H_2, however the effect of RS was only shown on CH_4 excretion. The physiological consequences of these observations warrant further investigation.

IMMUNOHISTOCHEMICAL LOCALIZATION OF TGFα AND EPIDERMAL GROWTH FACTOR RECEPTOR IN HUMAN STOMACH. Nagano K, Kawano S, Kobayashi I, Nakama A, Michida T, Masuda E, Tsujii M, Hayashi N, Tsuji S, Fusamoto H, Kamada T. First Dept. of Medicine, Osaka University School of Medicine, Osaka, Japan.

AIM: This study examines localization of TGFα and epidermal growth factor receptor (EGFR), in the human gastric mucosa by immunohistochemistry in search for the role of TGFα in gastric mucosal proliferation and regeneration. METHODS: Eleven patients with gastric ulcers and 10 volunteers with a normal endoscopic appearance were enrolled in the study. During endoscopic examination, two biopsy specimens for each were taken from the gastric body, the gastric antrum, and the regenerating mucosa adjacent to the ulcers and were served for immunohistochemistry for TGFα, EGFR, and proliferating cell nuclear antigen (PCNA). RESULTS: In both the oxyntic mucosa and the antral mucosa, cells expressing PCNA were exclusively located in the neck of the gland and were less frequently localized to the base of the gland. A part of parietal cells also expressed PCNA; however, surface mucous epithelial cells and chief cells rarely expressed it. A strong co-expression of TGFα and EGFR was demonstrated in the neck and the base of the gastric gland. Observations made in serially sectioned specimens suggest that PCNA-positive cells in the neck of the gland (i.e. stem cells) co-express strongly TGFα and EGFR. Parietal cells and mucous epithelial also express TGFα and EGFR, whereas chief cells do not. In the regenerating mucosa adjacent to the ulcer, PCNA-positive cells were localized to the basal portion of the gland and co-expressed TGFα and EGFR. CONCLUSION: The results of this study suggest that TGFα might be involved in the regulation of gastric mucosal proliferation and mucosal regeneration during gastric ulcer healing.

EFFECT OF A NEMATODE : *TRICHOSTRONGYLUS COLUBRIFORMIS* ON THE PROLIFERATION OF INTESTINAL EPITHELIAL CELLS HT29-D4. J.L. Nano*, S. Fournel*, H. Hoste°, S. Mallet°, P. Rampal*. *Laboratoire de Gastroentérologie, Faculté de Médecine, Nice, France. ° Station de Pathologie Aviaire et de Parasitologie de l'INRA, Tours, France.

Trichostrongylus colubriformis (TC), a nematode observed essentially in ruminants, provokes hyperplasia of intestinal crypts *in vivo*, especially at the site of worm implantation and in weakly infested regions of the intestine (Exp Parasitol 1988, 67 : 39-46). These findings suggested that TC might secrete an intestinal epithelial grotwth factor.

Aims : This *in vitro* study was designed to determine the effect of the conditioned medium from TC on intestinal epithelial cells HT-29 D4.

Methods : The nematodes were incubated for 24 h in DMEM and the supernatant was collected. The cells were incubated with various TC-conditioned medium concentrations for 72 h; the medium was changed every day.

Results : Our results revealed : (1) none of the TC-conditioned medium concentrations used (0,05 to 15 µg protein/ml) were cytotoxic, as measured by release of LDH; (2) cell proliferation increased as measured by (a) ^3H thymidine incorporation (+25% for 0,5 µg/ml, $p < 0,005$); the MTT method (+15% to +30% for concentrations of 0,2 to 1 µg/ml, $p < 0,005$); and cell counts (+12% to +20% for these same concentrations); (3) the activity of this factor persists after dialysis and disappears after heat treatment, acid hydrolysis, and TCA precipitation; (4) SDS-PAGE of TC-conditioned medium shown 7 majors proteins.

Conclusion : TC secretes a protein factor that induces *in vivo* and *in vitro* proliferation of intestinal epithelial cells. Purification of this factor is in progress.