A13

THE RELATIONSHIP BETWEEN INFANT AND JUVENILE SOCIAL ISOLATION AND ALCOHOL CONSUMPTION. M.E. Tumbleson, J.D. Dexter, J. Tinsley, C.C. Middleton. Schools of Medicine and Veterinary Medicine and Sinclair Research Farm, Univ. of MO, Columbia, MO 65212.

Twelve 5-day-old neonate Sinclair(S-1) miniature swine (6 boars and 6 gilts) were placed in 1x1x1 meter social isolation chambers which deprived them of tactile and visual stimuli from other animals while allowing auditory and olfactory stimulation from peers. Animals' diet was monitored for adequate growth. Twelve sex-matched litter mates were identified at age 5 days to be used as controls and reared in the usual fashion, kept with a sow until 7 weeks weaning time and then group-penned by litters. At age 6 months the isolated and control groups were group-housed by sex and group. The four groups were offered initially 4% w/v beer and increased 5% per week until the final alcohol solution of 20% w/v in beer. The animals were allowed access to the beer 1 hour 2 times daily, at 0800 and 1800 hours. One control boar was killed in a peer dominance encounter. Therefore, the final study groups included 6 isolate boars, 6 isolate gilts, 5 control boars and 6 control gilts. Alcohol consumption was monitored by individual animals. The results showed: 1)both groups of males consumed higher levels of alcohol than females; 2)isolate females showed lower alcohol consumption than control females; 3)no difference was observed between control and isolate males' alcohol consumption.

A14

SPECIES AND STRAIN - DEPENDENT ALDEHYDE DEHYDROGENASE. F. S. Messiha and H. F. Sproat, Departments of Pathology and Psychiatry, Texas Tech University Health Sciences Center, School of Medicine, Lubbock, Texas 79430.

Ethanol (ET)-produced endocrine dysfunction in some alcoholics and the possible detexification role of acetaldehyde metabolizing enzyme, i.e. aldehyde dehydrogenase (ALDH), in ET intoxication prompted the evaluation of ALDH in the reproductive tissue in male rodents. Testicular (TS) ALDH was found species-dependent with the hamster TS and rat epididymis possessing greater specific activities from all species studied, respectively. Determination of TS-ALDH in various mouse strains indicate that it is strain-dependent. TS-ALDH 4.0 $\pm$ 0.3 nMol/min/mg protein in C57BL, a mouse strain with preference for and tolerance to ET, was greater than 3.1 $\pm$ 0.1 unit measured for DBA, a mouse strain known for its avoidance for ET drinking ($p<0.02$). Intake of 25% ET solution as the sole drinking fluid for 10 days inhibited TS-ALDH by 35% ($p<0.01$) and 26% ($p<0.001$) in C57BL and DBA mouse strain, respectively. The results indicate that TS-ALDH is both species and strain dependent and ALDH may be conceivably implicated in the toxic action of ET-derived acetaldehyde in the testis.

A15

HEPATIC HISTOLOGIC CHANGES IN ETHANOL CONSUMING SINCLAIR MINIATURE SWINE. J.D. Dexter*, M.E. Tumbleson and C.C. Middleton, Sinclair Comparative Medicine Research Farm, School of Medicine and College of Veterinary Medicine, University of Missouri, Columbia, MO 65201.

Twenty-four (16 gilts and 8 boars) 2-year-old Sinclair(S-1) miniature swine were housed individually and divided into two groups of 4 boars and 8 gilts each. Pigs in group A were fed a 32% protein, corn-soybean meal diet which contained the recommended amounts of vitamins and minerals. The daily ration was divided equally for presentation in the am and pm. At each feeding, 2 g ethanol/kg body weight was mixed with the feed; therefore, each pig consumed 4 g ethanol/kg body weight/day. Pigs in group B were fed similar amounts of ration with cornstarch substituted isocalorically. Water was available ad libitum. Hepatic tissue biopsies were performed on each pig prior to the 24-week study. Eight pigs (4 from each group) were biopsied after 3 weeks on test, 8 were biopsied after 6 weeks on test and the remaining 8 pigs were biopsied after 12 weeks on test. At sacrifice, after 24 weeks on test, hepatic tissue samples were collected from each pig. Biopsies were performed under cyclohexylamine, nitrous oxide and oxygen anesthesia. After 3, 6 or 12 weeks on test, there was no evidence of hepatic cellular pathology. However, after 24 weeks on test, pigs consuming ethanol had more O-red-O stainable fat in the hepatic tissue. On a scale of 1 to 5, ethanol fed pigs had a score of 3.9 $\pm$ 1.2 and control pigs had a score of 1.7 $\pm$ 0.6. Supported in part by a grant from the USBA.

A16

THE ALCOHOL-DEPRIVATION EFFECT AND THE REST PRINCIPLE, J.D. Sinclair, Research Laboratories of the State Alcohol Monopoly (Alko), SF-00101 Helsinki 10, Finland.

Chronic consumption of ethanol induces a temporary propensity to drink increased amounts of it when it is first returned after alcohol deprivation, in monkeys and all six rat strains tested. This "alcohol-deprivation effect" appears to be related to other compensatory behaviors: to the increases in food, water, and saccharin intakes after deprivation and to spontaneous alternation in a T-maze.

Recently a general tendency has been identified (The Rest Principle, Lawrence Erlbaum Associates Inc., 1980) for neural connections to become weaker when used and stronger when subsequently resting, which can account for a wide range of phenomena, including the alcohol-deprivation effect. During continual access an equilibrium would exist for the connections involved in alcohol drinking between the weakening occurring during drinking and the strengthening occurring at other times; but deprivation would cause progressive strengthening, making it easier to elicit drinking and harder to terminate it. Thus, as is found, rats begin drinking alcohol immediately when it is returned, and the first bout is exceptionally large. Over-consumption for several days gradually weakens the connections until the previous equilibrium point is reached. Rats in which the weakening occurs more slowly during use would have a higher equilibrium point, thus would drink more alcohol during continual access, and would take longer to return to their previous intake level after deprivation, as is found for the AA rat strain developed by selective breeding for high voluntary alcohol intake.