



Housing, Husbandry, and Welfare of Rodents

[Animal Welfare Information Center](#)
United States Department of Agriculture
National Agricultural Library

ISSN: 1052-5378

Quick Bibliography Series, QB 97-04
January 1990 - June 1997
Updates QB 93-52

Updated by: [Information Resources on the Care and Welfare of Rodents, 2006](#)

340 citations from AGRICOLA
June 1997

Compiled By:

Tim Allen

[Animal Welfare Information Center](#), Information Centers Branch
National Agricultural Library, Agricultural Research Service, U. S. Department of Agriculture
10301 Baltimore Ave., Beltsville, Maryland 20705-2351



Go to:

[About the Quick Bibliography Series](#)

[Document Delivery Information](#)

[National Agricultural Library Cataloging Record](#)

[Search Strategy](#)

Note: The Author and Subject Indices are unavailable for this publication.

National Agricultural Library Cataloging Record:

Allen, Tim (John Timothy), 1953-
Housing, husbandry, and welfare of rodents.
(Quick bibliography series ; 97-04)
1. Rodents--Bibliography. 2. Rodents--Housing--Bibliography.
I. Title.
aZ5071.N3 no 97-04

Search Strategy

Set	Records	Request
1	482945	PY=1990:1997
2	28430	rat or rats or gerbil* or hamster* or mouse or mice or (guinea pig*) or vole or voles
3	10728	housing or cage or caging or bedding or cages or housed or facility or facilities
4	84099	husbandry or care or handl* or restrain* or transportation or bleed* or (blood collection) or manage* or not pest
5	3888	nutrition and (guide*)
6	8031	welfare or wellbeing or well-being
7	378	feed deprivation or food deprivation or water deprivation
8	75	#2 and #7
9	469	#1 and #2 and (#8 or #6 or #3 or #4 or #5)
10	1088	noise or lighting
11	14	#2 and #10
*12	483	#9 or #11

1 NAL Call No.: 447.8-AM3

Acute fasting is ineffective in suppressing pituitary-gonadal function of pubertal male rats.

Bergendahl, M.; Huhtaniemi, I. *Am-J-Physiol* v.264(5,pt.1): p.E717-E722. (1993 May)

Includes references.

Descriptors: food-deprivation; reproduction; testosterone; fsh; lh; hormone-secretion; messenger-rna; puberty; males; rats; hypothalamic-pituitary-testicular-axis

Abstract: Effects of short-term fasting (3-4 days) on pituitary-testicular functions were studied during sexual maturation in male rats at 25, 35, 45, 55, and 65 days of age. Among the main findings, testicular testosterone decreased by 41-68% at all ages ($P < 0.01-0.05$). The pituitary steady-state mRNA levels of the common alpha-subunit (28-55%) and follicle-stimulating hormone (FSH) beta-subunit (25-50%) decreased ($P < 0.01-0.05$) at 25, 55, and 65 days of age but not at 35 and 45 days; the luteinizing hormone (LH) beta-subunit did not respond at any age. Fasting decreased serum LH ($P < 0.01$) at 25, 55, and 65 days of age but not at 35 and 45 days. Likewise, fasting decreased pituitary and/or serum FSH only in the 25- and 65-day-old rats ($P < 0.01-0.05$). In conclusion, LH and FSH secretion, and the gene expression of common alpha- and FSH beta-subunits, decreased consistently during short-term fasting only in prepubertal (25 days) and adult (65 days) but not in peripubertal animals (35 and 45 days). Hence, the pubertal rise in gonadotropins represents such a strong positive induction that it largely overrides the antigonadotropic effect of fasting.

2 NAL Call No.: QP1.P4

Adrenal modulation of the enhanced fat intake subsequent to fasting.

Bligh, M. E.; DeStefano, M. B.; Kramlik, S. K.; Douglass, L. W.; Dubuc, P.; Castonguay, T. W. *Physiol-Behav* v.48(3): p.373-381. (1990 Sept.)

Includes references.

Descriptors: dietary-fat; fat-consumption; fasting; refeeding; macronutrients; caloric-intake; diet; corticosterone; adrenal-glands; adrenalectomy; feeding-preferences; protein-intake; body-weight; rats; carbohydrate-intake

Abstract: Elevations in corticosterone have been linked with the enhanced fat appetite of genetically obese Zucker rats. The present study set out to describe the effects of elevations in corticosterone in adult male Sprague-Dawley rats. Previous studies have shown that food deprivation leads to a time-dependent increase in basal corticosterone concentrations. It was predicted that rats would select a high fat diet during initial refeeding subsequent to a 24-hour fast and more severe food deprivation (48 hours) would promote greater fat consumption. Dependence upon adrenal hormones for this enhanced fat intake was examined with adrenalectomized animals. It was hypothesized that adrenalectomy would prevent the increase in fat intake seen in intact animals. Two experiments were performed. In the first, rats were given access to three separate macronutrient sources and allowed to self-select a diet for 7 days. They were then divided into groups and deprived of food for 0, 24, or 48 hours. At the end of the restriction period each rat was tail bled and macronutrient access was restored. Intakes were measured and blood samples taken at 1, 3, 6, 12, and 24 hours following restored access. During the first hour of refeeding, food-deprived animals ate significantly more fat than nondeprived animals. The enhanced fat intake was

positively correlated with the elevations in corticosterone observed at the start of the refeeding period ($r = 72$). In the second experiment, rats were allowed to self-select a diet for 9 days. On Day 10 the rats received either bilateral adrenalectomies or sham operations. They were allowed to recover for 5 days. On Day 15 they were assigned to deprivation groups and deprived of food for 0, 24, or 48 hours. After their respective restriction periods, the rats were tail bled and food access was restored. During the first hour of refeeding, sham animals deprived of food ate significantly more fat than all other groups. Enhanced fat intake was not observed in the adrenalectomized animals, suggesting that adrenal hormones mediate dietary fat intake.

3 NAL Call No.: QL55.F43-1993

An advancement in cage design to provide environmental enrichment for mice when rearing the plague flea *Xenopsylla cheopis* (Roths) for behavioural studies.

Clark, F.; Willan, P. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 319-324.*

Includes references.

Descriptors: mice; cages; design; xenopsylla-cheopis; laboratory-rearing; animal-welfare; adverse-effects

4 NAL Call No.: QL55.A1L3

Age of pairing affects reproduction in prairie voles.

Solomon, N. G. *Lab-Anim* v.25(3): p.232-235. (1991 July)

Includes references.

Descriptors: pitymys-ochrogaster; age-differences; reproductive-efficiency; litter-size; pups; birth-weight; age-at-first-mating

Abstract: The effect of the age at pairing on reproduction of weanling prairie voles was studied. The proportion of pairs producing a litter within 60 days was influenced significantly by the age at pairing. More voles paired at 31 days of age produced litters than those paired at 21 days of age. Assuming a gestation interval of 21 days, the earliest mating occurred around 33 days of age in both groups. On average, successful matings did not occur until voles were housed together for 2 to 3 weeks. No other measured variables were affected by age of pairing.

5 NAL Call No.: QL55.A1L3

Allergy to laboratory mice and rats: a review of its prevention, management, and treatment.

Hunskar, S.; Fosse, R. T. *Lab-anim* v.27(3): p.206-221. (1993 July)

Includes references.

Descriptors: allergies; laboratory-animals

Abstract: Abstract: Allergy to laboratory animals is reviewed from a management point of view. Personnel issues, medical therapy, legal aspects, animal house environments and work routines are discussed. Modern methods of medical treatments are presented but it is recommended that environmental control should be given priority over drugs. Several ventilation and building design systems are reviewed from an ALA viewpoint. New technology (including down-ventilated benches, ventilated cages) is reviewed and possible effectiveness analysed. These systems, though potentially of value, lack adequate testing under clinical conditions. We conclude that there are many clinically untested techniques that remain to be proven and whose efficacy has not been documented.

6 NAL Call No.: 447.8-Am3

Altered expression of GLUT-1 and GLUT-3 glucose transporters in neurohypophysis of water-deprived or diabetic rats.

Vannucci, S. J.; Maher, F.; Koehler, E.; Simpson, I. A. *Am-j-physiol* v.267(4): p.E605-E611. (1994 Oct.)

Includes references.

Descriptors: experimental-diabetes; water-deprivation; dehydration-physiological; glucose; proteins; vasopressin; protein-synthesis; protein-secretion; energy-metabolism; posterior-pituitary; rats; glucose-transporter-proteins

Abstract: Progressive dehydration due to water deprivation and streptozotocin diabetes both produce increased activity of the hypothalamoneurohypophysial system and enhanced vasopressin secretion. To determine whether enhanced metabolic activity affects glucose transporter protein expression, this study examined the effect of these conditions on 45-kDa GLUT-1

and the neuronal glucose transporter, GLUT-3, which mediate glucose transport in the rat neurohypophysis. Progressive water deprivation increased hematocrit, plasma electrolytes Na⁺ and Cl⁻, and vasopressin over 3 days, relative to the severity of dehydration. Plasma vasopressin increased threefold by 24 h, reaching 4.5-fold by 72 h. These changes were reflected in a 56 and 75% decrease in neurohypophysial vasopressin content by 48 and 72 h, respectively. Significant changes in glucose transporters were also observed at 48 and 72 h, with GLUT-1 increasing by 18 and 44% and GLUT-3 increasing by 42 and 55%, respectively. Streptozotocin-induced diabetes produced increases in hematocrit, plasma Cl⁻, and vasopressin, although the magnitude of these changes was less than with dehydration. There was a twofold increase in plasma vasopressin by 3 days, commensurate with the onset of overt diabetes, and a threefold increase by 2 wk. These changes were reflected in a 30 and 40% decline in neural lobe vasopressin content, respectively. Despite the difference in the magnitude of hormone response, GLUT-3 increased by the same amount (53%) as in dehydration. GLUT-1, however, was decreased 16% by 3 days and 25% by 1 and 2 wk of diabetes. Although the opposite effects on GLUT-1 may relate to differences in circulating insulin or glucose, this study is.

7 NAL Call No.: QL55.A1L33

An alternative anesthesia protocol for tail artery bleeding in rats.

Maher, J. A. *Lab-anim* v.24(10): p.39. (1995 Nov.)

Includes references.

Descriptors: rats; anesthesia; blood-sampling

8 NAL Call No.: 391.8-F73

An alternative strategy to the use of guinea pigs for the identification of skin sensitization hazard.

Basketter, D. A.; Scholes, E. W.; Chamberlain, M.; Barratt, M. D. *Food-chem-toxicol* v.33(12): p.1051-1056. (1995 Dec.)

Includes references.

Descriptors: skin-tests; toxicity; regulations; allergies; rabbits

Abstract: For over half a century, guinea pig methods have dominated the field of toxicology concerned with the identification of skin sensitizers. Specific protocols, for example the guinea pig maximization test (GPMT), have been pre-eminent in the identification of skin sensitization hazard for regulatory purposes. However, there are increasingly several forces causing change, not least animal use welfare considerations. In response to this and to address the need for a rapid screen for chemical allergens, an alternative strategy has been developed. In the first instance, a chemical is assessed by a computer-based expert system. This system is constructed from some 50 rules describing the key chemically reactive substructures of known skin sensitizers. The output from the expert system is also evaluated in the light of the understanding of the skin penetration characteristics of the chemical. In this way, and without use of animals, the likelihood that a chemical represents a skin sensitization hazard is assessed based on the two key characteristics of a skin sensitizer: (1) its direct or indirect ability to react with skin protein (i.e. does it contain a structural alert?); and (2) the ability of the chemical to partition into the appropriate epidermal compartment. When the chemical does possess a structural alert and has the capacity to penetrate skin sufficiently, then it may be regarded as a potential skin sensitizer. Subsequent to this screening phase, if necessary the chemical may be assessed in the murine local lymph node assay. This assay is quicker and cheaper than traditional guinea pig assays and importantly is less stressful to the fewer animals that skin sensitization hazard. In this paper, the above strategy is described in more detail, focusing on its relevance to hazard identification and its value in animal welfare terms. It is concluded that the strategy provides an important opportunity for both substantial reduction and refinement of animal use in a manner which will not compromise the existing standard of classification and labelling of skin sensitization hazard in the European Union.

9 NAL Call No.: 448.3-Ar23

Analysis of target organs for the latency of murine cytomegalovirus DNA using specific pathogen free and germfree mice.

Matsuzawa, H.; Shimizu, K.; Okada, K.; Ando, K.; Hashimoto, K.; Koga, Y. *Arch-virol* v.140(5): p.853-864. (1995)

Includes references.

Descriptors: cytomegalovirus; mice; latent-infections; lungs; spleen; heart; dna; germfree-state; spf-husbandry; salivary-glands

Abstract: Cytomegalovirus (CMV) establishes a latent infection in its host; however, the organ sites of viral latency and its mechanism still remain to be fully clarified. To elucidate this issue, a latent infection with murine (M)CMV was attempted to induce in mice and the organ sites of the latent viral genome were examined for more than one year by a polymerase

chain reaction (PCR). As a result, latent MCMV DNA was detectable in both the lung and the spleen as late as 59 weeks after infection. The heart was also observed to be a target organ of latent MCMV DNA, though the amount of viral DNA was much less than that seen in the lung and spleen. In germfree (GF) mice, on the other hand, no such latent viral DNA was observed in the spleens, while it was seen, but to a significantly smaller degree, in the lungs and the hearts than in the same organs of specific pathogen-free (SPF) mice. The amount of infectious virions generated in the host appeared to be almost equal between the GF and SPF mice. The above findings therefore suggest that the spleen, lung and heart are target organs for MCMV latency and the indigenous bacterial flora, which are not colonizing in GF mice, play an important role in the establishment of such viral latency in SPF mice.

10 NAL Call No.: 410.9-P94

Anatomic features and radiographic observations of gastric emptying and small intestinal motility in the rat.

Perry, R. L.; Carrig, C. B.; Williams, J. F.; Johnson, C. A.; Kaneene, J. B. *Lab-anim-sci* v.43(6): p.586-593. (1993 Dec.) Includes references.

Descriptors: rats; abdomen; stomach; small-intestine; radiography; stomach-emptying; intestinal-motility; transit-time

Abstract: This study presents the first report of the identification of anatomic structures on survey radiographs of the abdomen of the rat, along with detailed barium contrast studies of the gastrointestinal tract in normal rats. The rats (49 to 112 days old) were chemically restrained with a combination of 0.71 mg ketamine hydrochloride/g of body weight and 0.5 mg of acetylpromazine maleate injected intramuscularly. Following sedation, a 36% (wt/vol) micropulverized barium sulfate suspension was administered via a stomach tube at a dose of 0.02 ml/g of body weight. The radiographic features of the gastrointestinal tract were enhanced after coating of the mucosal surfaces with the high-density barium suspension. Internal structures of the stomach and mucosal surfaces of the intestine were clearly identified. The barium contrast study was used to establish gastrointestinal transit times. The mean gastric emptying time was 11 +/- 4.27 (SEM) min and mean intestinal transit time was 5 +/- 0.75 (SEM) h. Image intensification fluoroscopy was used to observe patterns of small intestinal motility and to establish small intestinal contraction rates. Prominent cluster of circular contractions were primarily observed in the jejunum, and wave-type peristalsis was primarily observed in the duodenum. Isolated circular contractions and weak segmentation patterns were observed in the ileum. The mean contraction rate per minute was observed to be 14 +/- 2.12 (SEM) in the jejunum. We propose that under the conditions of the current study, radiographic investigation of gastrointestinal function in rats is a feasible and inexpensive procedure.

11 NAL Call No.: QL55.F43-1993

Animal models in the study of wound healing in the skin.

Lansdown, A. B. G.; Pate, P. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 395-396.*

Poster presentation at the symposium.

Descriptors: rats; rabbits; pigs; skin; healing; species-differences

12 NAL Call No.: QH442.G4522

Animal welfare groups battle Harvard's onco-mouse patent.

Rood, M. *Biotech-Dly. Washington, D.C. : King Pub. Group. Jan 13, 1993. v. 2 (100) p. 1, 3.*

Descriptors: animal-welfare; patents; genetic-engineering; public-opinion; animal-experiments; europe; england

13 NAL Call No.: QD415.A1I5

Antioxidant enzyme activities and lipid peroxidation levels in exercised and hypertensive rat tissues.

Hong, H.; Johnson, P. *Int-j-biochem-cell-biol* v.27(9): p.923-931. (1995 Sept.)

Includes references.

Descriptors: exercise; muscles; antioxidants; lipid-peroxidation; hypertension; superoxide-dismutase; catalase; glutathione-peroxidase; glutathione-reductase-nadph; enzyme-activity; animal-tissues; rats

Abstract: Previous studies have shown that exercise-induced changes in muscle antioxidant status occur shortly after exercise. The present studies were designed to determine if longer-term exercise-related changes in antioxidant enzyme activities in both normotensive (WKY) and hypertensive rats (SHR) occurred, and if these changes were related to the level of lipid peroxidation. WKY and SHR rats were exercised over a 10-week period using a progressive treadmill regimen. After a 1-week detraining period, the animals were euthanized and measurements of tissue antioxidant enzyme activities and

lipid peroxide levels were determined in both exercised and cage-sedentary groups. Decreases in antioxidant activities (particularly glutathione peroxidase and catalase) in liver, kidney, skeletal and cardiac were associated with exercise training in both WKY and SHR rats (e.g. left ventricular glutathione peroxidase specific activity in WKY rats was decreased from 234 +/- 25 [SD, n = 12] to 187 +/- 17 [SD, n = 11] units/mg protein). Elevations in activities of antioxidant enzymes were generally associated with hypertension in these tissues (e.g. left ventricular glutathione peroxidase specific activity in SHR rats was 275 +/- 30 [SD, n = 12] units/mg protein), but changes in activities were more variable than those seen in response to exercise. Exercise-related changes in tissue levels of thiobarbituric acid-reactive substances (an indirect measure of tissue lipid peroxide levels) generally did not correlate with exercise-related antioxidant enzyme activity changes, and hypertension had no effect on these levels except in liver. The results show that alterations of the activities of tissue. results also suggest that the mechanisms by which exercise and hypertension affect tissue antioxidant enzyme activities are different.

14 NAL Call No.: QL55.A1L3

Aqueous lithium heparin is a superior anticoagulant to solid heparin for blood collection from the retro-orbital sinus of rats.

Slaughter, M. R.; Moen, J. S. *Lab-Anim* v.25(3): p.272-276. (1991 July)

Includes references.

Descriptors: rats; blood-sampling; heparin; blood-coagulation; blood-plasma; blood-chemistry

Abstract: Blood specimens from the retro-orbital sinus of 80 Sprague Dawley rats were collected into tubes containing lithium heparin either as a solid or an aqueous solution. Plasma was separated for blood chemistry analysis. Twenty-eight blood specimens collected into tubes containing solid heparin were clotted and eight specimens were partially clotted making these samples unsuitable for some analyses. None of the specimens collected into heparin solution showed any evidence of clotting. The variances of lactate dehydrogenase and alpha-hydroxybutyrate dehydrogenase activities in plasma prepared with solid heparin were significantly greater than those prepared with heparin solution. Lithium heparin solution is now used routinely in our laboratory.

15 NAL Call No.: QL55.F43-1993

Arteriosclerosis-preventing effect of a high medium-chain-triglyceride diet in Dahl-S rats.

Calaminus, G.; Meister, G.; Herberg, L. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 488-491.*

Poster presentation at the symposium.

Descriptors: rats; dietary-fat; medium-chain-triacylglycerols; blood-serum; cholesterol; blood-pressure; histology; arteries; atherosclerosis; glomerulus

16 NAL Call No.: QL55.F43-1993

Aspergillus niger isolated in an outbreak of rhinitis in rats.

Bleby, J.; Rozengurt, N.; Sanchez, S. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 387-389.*

Poster presentation at the symposium.

Descriptors: rats; aspergillus-niger; rhinitis; outbreaks; histopathology; nose; mucosa; aspergillus

17 NAL Call No.: QL55.A1L33

Assessing laboratory life for golden hamsters: social preference, caging selection, and human interaction.

Arnold, C. *Lab-anim* v.23(2): p.34-37. (1994 Feb.)

Includes references.

Descriptors: golden-hamsters; social-behavior; cages; floors; man; interactions; handling

18 NAL Call No.: 410.9-P94

Behavioral and physiologic effects of inapparent wound infection in rats.

Bradfield, J. F.; Schachtman, T. R.; McLaughlin, R. M.; Steffen, E. K. *Lab-Anim-Sci* v.42(6): p.572-578. (1992 Dec.)

Includes references.

Descriptors: rats; wounds; latent-infections

Abstract: There is a common notion that rats are resistant to postoperative wound infection because many recover from surgery performed under nonsterile conditions. As a result, nonaseptic surgical techniques are used commonly in rat surgery. Our aim was to determine if these techniques cause wound infection and, if so, whether or not the infection, inapparent to casual observation, creates measurable changes in rat physiology and behavior. Rats subjected to craniotomies or laparotomies and inoculated with 10(8) *Staphylococcus aureus* or *Pseudomonas aeruginosa* or sterile saline were tested for open-field activity, freezing behavior, home-cage behavior score, and wheel-running activity. Physiologic indices included lactate dehydrogenase, blood glucose, plasma fibrinogen, complete blood counts, wound bacterial counts and histology scores, body temperature, and body weight. Although no clinical signs were detected by postoperative observation, rats inoculated with bacteria were significantly less active in the open field and the duration of freezing behavior was shorter. Plasma fibrinogen, serum glucose, total white blood cell counts, and wound histology scores were significantly altered in the bacteria-inoculated rats. These findings underscore the need for sterile techniques in rat surgery to avoid confounding experimental data.

19 NAL Call No.: SF405.5.A23

Behavioral evaluation of spatially enhanced caging for laboratory rats at high density.

Anzaldo, A. J.; Harrison, P. C.; Riskowski, G. L.; Sebek, L. A.; Maghirang, R.; Stricklin, W. R.; Gonyou, H. W. *Contemporary-lab-anim-sci* v.34(1): p.56-60. (1995 Jan.)

Includes references.

Descriptors: rats; cages; cage-density; design; spatial-distribution; animal-welfare; animal-behavior; high-perimeter-cages; three-dimensional-cages

20 NAL Call No.: QL55.F43-1993

Behavioural consequences of environmental enrichment in two strains of mice.

Weerd, H. A. v. d.; Baumans, V.; Blom, H. J. M.; Zutphen, L. F. M. v. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 49-53.*

Includes references.

Descriptors: mice; inbred-strains; fearfulness; enrichment; animal-welfare; strain-differences; grooming; defecation; animal-behavior; cages; litter; physical-activity; exploration-behavior; nesting-material

21 NAL Call No.: QL55.F43-1993

Behavioural differentiation of mice housed on different cage floors.

Schlingmann, F.; Weerd, H. A. v. de.; Blom, H. J. M.; Baumans, V.; Zutphen, L. F. M. v. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 355-357.*

Poster presentation at the symposium.

Descriptors: mice; cages; floors; laboratory-methods; animal-welfare; animal-behavior; pressure-transducers; preferences

22 NAL Call No.: 442.9-So1

beta-Alanine protects against taurine and NaCl-induced hypernatremia in the rat.

McBroom, M. J.; Davidson, N. *Proc-Soc-Exp-Biol-Med* v.211(2): p.184-189. (1996 Feb.)

Includes references.

Descriptors: hypernatremia; taurine; sodium-chloride; alanine; metabolic-inhibitors; nutrient-transport; mode-of-action; rats

Abstract: Rats drinking a combination of taurine and hypertonic saline solution rapidly develop hypernatremia, but rats drinking either solution alone do not. The mechanism by which taurine disrupts the ability to deal with a salt load is not clear. Rats housed in metabolism cages were studied. Food intake, fluid intake, plasma sodium concentration, urine output, sodium balance, visible water balance, and urine osmolality were determined over a period of 8 days. Rats drinking 0.1 M taurine plus 1.8% NaCl developed a mean plasma sodium concentration of 160 +/- 18 mM by Day 6, compared with 137 +/- 1.6 mM in water drinking controls. Ingestion of 1.8% saline alone produced only a mild, transient rise in plasma sodium (< 150 mM), which returned to control levels by Day 8. Ingestion of neither 0.1 M taurine alone nor 0.1 M beta-alanine, a taurine transport antagonist, produced any evidence of hypernatremia throughout the experiment. When beta-alanine was added to the taurine + saline regimen, mean plasma sodium reached only 149 +/- 16 mM (Day 6). Inspection of the ratio of

cumulative sodium balance to cumulative water balance revealed a rapid increase until Day 2, followed by a virtual plateau thereafter in the taurine + saline group. Rats drinking saline alone showed an equally rapid rise in the ratio, but to a lower plateau level, suggesting that taurine exerts a much more pronounced disturbance of sodium balance than of water balance. The addition of beta-alanine to the regimens of taurine + saline or saline alone produced ratios of cumulative sodium to cumulative water balance significantly lower than that of either regimen without beta-alanine. These findings suggest that taurine. The effect of beta-alanine in rats drinking saline alone is consistent with a role for endogenous taurine in normal electrolyte homeostasis.

23 NAL Call No.: QP141.A1N88

Body composition and brown adipose tissue in sedentary and active mice.

Bell, R. R.; McGill, T. *Nutr-Res. Elmsford, N.Y. : Pergamon Press. June 1991. v 11 (6) p. 633-642.*

Includes references.

Descriptors: physical-activity; body-composition; body-fat; brown-fat; energy-balance; mice

Abstract: The influence of exercise on body composition, brown adipose tissue (BAT) activity and energy balance was studied in young female CD1 Swiss albino mice. Mice were divided into 2 groups with different levels of activity; Sedentary Controls (SC) were housed in standard mouse cages while the Active (A) group had free access to activity wheels. All mice were fed stock diet and after 6 weeks (Stock Period), energy intake, body composition and BAT were analyzed in half of the mice. The remaining mice continued in their same activity groups but were encouraged to overeat by cafeteria feeding with highly palatable human foods. Energy intake, energy balance, body composition and BAT were again measured after 2 weeks (Cafeteria Period). The Active group spent considerably more time in physical activity and consumed 18% more kJ during the Stock Period than the Sedentary Controls. Despite different levels of exercise and food intake, both groups had similar carcass energy content and BAT activity during the Stock Period. The SC group increased energy intake by 52% in response to cafeteria feeding while the A group increased energy intake by only 28%. The SC mice accumulated significantly more carcass fat than the A mice during the Cafeteria Period; SC, 15.1 +/- 1.2% and A, 9.0 +/- 0.4% carcass fat. The Active mice were better able to maintain body weight and energy balance when fed an energy dense diet. BAT activity was increased by cafeteria feeding (diet-induced hyperphagia) but was not affected by exercise (activity-induced hyperphagia).

24 NAL Call No.: RC628.A1O2

Body composition, muscle and fat pad changes following two levels of dietary restriction and/or exercise training in male rats.

Ballor, D. L.; Tommerup, L. J.; Smith, D. B.; Thomas, D. P. *Int-J-Obesity* v.14(8): p.711-722. (1990 Aug.)

Includes references.

Descriptors: weight-losses; exercise; body-composition; food-restriction; body-lean-mass; oxygen-consumption; body-protein; male-animals; rats

Abstract: This study examined the effects of exercise training on conservation of lean mass during moderate and severe dietary restriction in male Sprague-Dawley rats. Eight rats each (48 total) were assigned to one of three levels of dietary restriction (ad lib., AL; moderate, MR; severe, SR) and to one of two activity levels (cage-confined, CC; or treadmill exercised, E) for a 10-week period. Post-intervention, the AL-E (91 percent), MR-CC (84 percent), MR-E (86 percent), SR-CC (66 percent) and SR-E (68 percent) groups all weighed less than the AL-CC group (427 +/- 4.3 g). Exercise training resulted in conservation of lean mass (protein + water + ash) at the moderate but not severe levels of dietary restriction. Further examination showed that this was mostly water since no between-group differences existed at any given diet level for protein or ash mass. Exercise training did elicit conservation of left ventricular heart muscle mass at both the moderate and severe levels of dietary restriction. In contrast, gastrocnemius muscle mass was conserved or maintained only at the moderate dietary restriction level. Thus, the level of dietary restriction appears to affect the ability of exercise training to elicit conservation of both total lean mass and the mass of individual muscles during diet-induced body mass reduction.

25 NAL Call No.: QP1.P4

Body weight gain, food intake and adrenal development in chronic noise stressed rats.

Alario, P.; Gamallo, A.; Beato, M. J.; Tranco, G. *Physiol-Behav* v.40(1): p.29-32. (1987)

Includes references.

Descriptors: rats; food-intake; body-weight; adrenals; noise-pollution; stress; corticotrophin; weight-gain

26 NAL Call No.: QL937.S83--1992**Brain maps : computer graphics files. Professional version 1.0.**

Swanson, L. W. *The Netherlands : Elsevier, c1992. 4 computer disks user guide + 1 chart (col. ; 40 x 58 cm.)*

Title from disk label.

Descriptors: Rats-Nervous-system-Software; Brain-Anatomy-Software

27 NAL Call No.: QL55.F43-1993**Breeding of athymic nude rats by embryo transfer.**

Cranley, J. J.; Srikantharajah, A.; Leeming, G. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 481-483.*

Poster presentation at the symposium.

Descriptors: rats; embryo-transfer; blastocyst; immune-competence; animal-health; zona-pellucida; young-animals; size

28 NAL Call No.: QL55.I5**The captive management of a breeding colony of Ryuku mice (*Mus caroli*).**

Castle, J. P.; Marshall, P. E. *Anim-Tech-J-Inst-Anim-Tech* v.41(3): p.191-196. (1990 Dec.)

Includes references.

Descriptors: mus; wild-strains; laboratory-rearing; south-asia; ryuku-islands

Abstract: Ryuku mice (*Mus caroli*) are a strain of wild mouse, which are indigenous throughout Southern Asia, including the Ryuku Islands from where their name originates. We were requested to set up and maintain a colony because they have different D.N.A. properties from the common laboratory mouse (*Mus musculus*). This enables a unique cell marking technique to be used, which in this instance is being applied to the study of tooth and gum development.

29 NAL Call No.: QL55.H8**A case study of Horace and some implications.**

Schneider, S. M. *Hum-Innovations-Alternatives. Washington Grove, MD : Psychologists for the Ethical Treatment of Animals. 1992. v. 6 p. 320-322.*

Includes references.

Descriptors: rats; pet-care; animal-behavior; case-reports; animal-welfare

30 NAL Call No.: 410.9-P94**The cellular and molecular pathogenesis of coronaviruses.**

Compton, S. R.; Barthold, S. W.; Smith, A. L. *Lab-Anim-Sci* v.43(1): p.15-28. (1993 Feb.)

Includes references.

Descriptors: coronavirus; pathogenesis

Abstract: Coronaviruses cause a wide spectrum of diseases in humans and animals but generally fall into two classes, with respiratory or enteric tropisms. Mouse hepatitis virus (MHV) and rat coronaviruses are the virus most frequently encountered in the laboratory animal setting. This review focuses primarily on the cellular and molecular aspects of MHV pathogenesis. The high mutation and recombination rates of coronaviruses lead to a diverse, ever-changing population of MHV stains. The spike (S) protein is the most variable coronavirus protein and is responsible for binding to cell surface receptors, inducing cell fusion and humoral and cellular immunity. Differences within the S protein of different MHV strains have been linked to their variable tropisms. Since immunity to MHV is strain-specific, seropositive mice can be reinfected with different strains of MHV. Natural infections with MHV are acute, with persistence occurring at the population level, not within an individual mouse, unless it is immunocompromised. Age, genotype, immunologic status of the mouse, and MHV strain influence the type and severity of disease caused by MHV. Interference with research by MHV has been reported primarily in the fields of immunology and tumor biology and may be a reflection of MHV's capacity to grow in several types of immune cells. While many methods are available to diagnose coronavirus infection, serologic tests, primarily ELISA and IFA, are the most commonly used. MHV is best managed on a preventive basis. Elimination of MHV from a population requires cessation of breeding and halting the introduction of naive mice into the population.

31 NAL Call No.: 410.9-P94**Cerebrospinal larva migrans due to *Baylisascaris procyonis* in a guinea pig colony.**

Van Andel, R. A.; Franklin, C. L.; Besch Williford, C.; Riley, L. K.; Hook, R. R. Jr.; Kazacos, K. R. *Lab-anim-sci* v.45(1): p.27-30. (1995 Feb.)

Includes references.

Descriptors: guinea-pigs; larva-migrans; nematoda; brain; colonies; nematode-larvae; symptoms; litter; wood-shavings; contamination; feces; procyon-lotor

Abstract: Four guinea pigs from a colony of approximately 50 animals were examined for progressive neurologic disease of 5 days' duration. Signs of neurologic dysfunction included cachexia, stupor, hyperexcitability, lateral recumbency, and opisthotonos. Results of gross pathologic, microbiologic, and serologic examinations were unremarkable. Histologic examination of cerebral and cerebellar sections revealed multifocal malacia and regions of eosinophilic granulomatous inflammation. Cross-sections of nematode larvae, identified as *Baylisascaris* sp., most likely *B. procyonis*, the raccoon ascarid, were seen in the brain of some affected animals. An intact *Baylisascaris* larva was recovered from a symptomatic animal when cerebral tissue was processed by the Baermann extraction technique. Results of further investigation indicated that wood shavings used for the guinea pigs had been contaminated by raccoon feces, some of which contained numerous *B. procyonis* eggs. The bedding source for this colony was changed and, to date, no new cases of neurologic disease have been seen. This report emphasizes the potential insidious entrance of *B. procyonis* into well-managed laboratory animal facilities.

32 NAL Call No.: 410.9-P94

Cervical lymphadenitis in guinea pigs: infection via intact ocular and nasal mucosa by *Streptococcus zooepidemicus*.

Murphy, J. C.; Ackerman, J. I.; Marini, R. P.; Fox, J. G. *Lab-Anim-Sci* v.41(3): p.251-254. (1991 June)

Includes references.

Descriptors: guinea-pigs; lymphadenitis; streptococcus-zooepidemicus; pathogenesis; experimental-infection; mucosa; eyes; nose

Abstract: The traditional view regarding the pathogenesis of cervical lymphadenitis in guinea pigs is that Lancefield Group C *Streptococcus* gains access to cervical lymph nodes via an abraded oral mucosa. In this study, it is established that inoculation of intact nasal and conjunctival mucous membranes with *Streptococcus zooepidemicus* (Lancefield Group C) also can produce the disease. Weanling (SPF) guinea pigs (*Cavia porcellus*) were divided into two experimental groups of 10 and two control groups of four each. Guinea pigs from each group were individually housed in separate cubicles. Group I was inoculated with 0.05 ml of culture containing 2.8×10^7 CFU/ml of *S. zooepidemicus* into the conjunctiva of the left eye. Group II received a similar inoculum into the left nares. Control groups received 0.05 ml of TSB broth in the same sites. Five of ten guinea pigs in Group II died four to nine days postinoculation. Surviving guinea pigs were euthanatized at intervals between days 4-13 postinoculation. All guinea pigs were necropsied, cultured and examined for evidence of infection. *S. zooepidemicus* was recovered from 30/50 and 39/46 sites cultured from Groups I and II, respectively. Lymphadenitis was found in cervical lymph nodes from 8/10 guinea pigs in Group I and 10/10 in Group II. The conjunctival and nasal mucosa, therefore, represent potential sites of entry resulting in cervical lymphadenitis in guinea pigs.

33 NAL Call No.: QD415.A1B52

Changes in alanine turnover rate due to nutritional and genetic obesity in the rat.

Yebras, M.; Salvado, J.; Arola, L.; Remesar, X.; Segues, T. *Biochem-mol-biol-int* v.34(1): p.67-74. (1994 Aug.)

Includes references.

Descriptors: obesity; alanine; nitrogen-metabolism; protein-turnover; genetic-defects; diet; amino-acid-turnover; dietary-obesity

Abstract: The changes in alanine turnover were determined in Zucker rats, which were either genetically obese (fa/fa) or rendered obese by dietary treatment (cafeteria fed). The whole body rate of alanine turnover was higher in genetically obese rats than in rats in which obesity was induced by diet (cafeteria). This is possibly due to variations in the rate of the amino acid incorporation into proteins, since the rate of whole body alanine degradation is the same for both groups. Thus, the different pattern followed by alanine turnover rate in these types of obese animals reflects the differences in the nitrogen economy of these animals, pointing to a higher alanine utilization in the genetically obese animals and a conservative management of alanine in the cafeteria-fed animals.

34 NAL Call No.: QD415.A1I5

Changes in apoprotein distribution between lipoprotein classes of hypercholesterolemic rats treated with ascorbate.

Santillo, M.; Mondola, P.; Santangelo, F.; Gioielli, A.; Iossa, S.; Basilisco, A.; De Mercato, R. *Int-j-biochem-cell-biol*

v.27(3): p.257-262. (1995 Mar.)

Includes references.

Descriptors: diet; ascorbic-acid; cholesterol; hypercholesterolemia; lipid-metabolism; apolipoproteins; blood-lipids; rats; nath-diet

Abstract: It is known that ascorbate has a lipid lowering effect, accompanied by a drop of apo B, in rats fed a diet enriched with 15% of cholesterol (Nath diet). In order to better clarify the role exerted by asorbate in lipid metabolism, the effect of ascorbate administration on apolipoprotein pattern in rats fed the Nath diet was investigated. Wistar male rats fed for two months the Nath diet were treated i.p. with 60 mg/kg of body weight of ascorbate for 10 days. Blood collection before and after the treatment was performed by intracardiac puncture. Lipoprotein were prepared by preparative ultracentrifugation and their apoprotein content was obtained by densitometric scanning of the apoprotein electrophoretic pattern. The decrease of total plasma cholesterol and triglycerides and of cholesterol, triglycerides and protein content of all plasma lipoproteins observed in ascorbate treated rats, is accompanied by a marked modification of the apolipoprotein pattern of all lipoprotein classes studied, with an increase of apo E content in VLDL-IDL and LDL fractions (135 and 44% respectively), and a decrease of C (37%), AI (70%) and B (37.5%) apoproteins in VLDL-IDL and of apo C (36%) in LDL. On the contrary, in HDL fraction ascorbate induces an increase of C apoproteins (26%) and a decrease of E and B apoproteins (47% and 71% respectively). The data reported clearly show that in hypercholesterolemic rats the lipid lowering effect of ascorbate administration, is accompanied by a marked modification of the apoprotein pattern of all lipoprotein classes studied.

35 NAL Call No.: 447.8-Am3

Changes in brown adipose tissue composition during fasting and refeeding of diet-induced obese mice.

Muralidhara, D. V.; Desautels, M. *Am-j-physiol* v.266(6,pt.2): p.R1907-R1915. (1994 June)

Includes references.

Descriptors: obesity; diet; adipose-tissue; fasting; refeeding; heat-production; energy-expenditure; sympathetic-nervous-system; mitochondria; proteins; mice; uncoupling-protein

Abstract: The objective of this work was to evaluate how obesity would influence the changes in brown fat (BAT) thermogenic capacity during fasting-refeeding. Mice fed either chow or chow + high-fat supplement for 6 wk had body weights of 34 +/- 1 and 43 +/- 1 g, respectively. They were fasted for 48 h followed by ad libitum refeeding for up to 5 days. Loss of carcass fat was similar between food-deprived mice previously fed chow or chow + high-fat supplement. However, even after a 48-h fast, obese mice still had a carcass fat content much greater than that of chow-fed mice. Brown fat atrophy caused by food deprivation was characterized by reductions in tissue weight, fat, mitochondrial proteins and uncoupling protein (UCP), without change in tissue DNA. Obesity did not alter the rate or extent of brown fat atrophy. Upon refeeding 48-h- fasted lean and obese mice, there was recovery of BAT thermogenic capacity that was similar between the two groups. In chow-fed mice, an intact neural input was essential for recovery of BAT thermogenic capacity during refeeding. These results indicate that food deprivation triggers an immediate adaptive response in mice previously fed chow or chow + a high-fat supplement and that reduction in brown fat thermogenic capacity during fasting and its recovery during refeeding appear little affected by the size of the animal energy reserves.

36 NAL Call No.: SF405.5.A23

Characterization and quantification of microenvironmental contaminants in isolator cages with a variety of contact beddings.

Perkins, S. E.; Lipman, N. S. *Contem-top-lab-anim-sci* v.34(3): p.93-98. (1995 May)

Includes references.

Descriptors: mice; cages; litter; isolation; contaminants; microenvironments; temperature; relative-humidity; carbon-dioxide; ammonia; acetic- acid; sulfur-dioxide

37 NAL Call No.: RA1190.F8

Characterization of olfactory deficits in the rat following administration of 2,6-dichlorobenzonitrile (Dichlobenil), 3,3'-iminodipropionitrile, or methimazole.

Genter, M. B.; Owens, D. M.; Carlone, H. B.; Crofton, K. M. *Fundam-appl-toxicol* v.29(1): p.71-77. (1996 Jan.)

Includes references.

Descriptors: dichlobenil; thiamazole; nitriles; intraperitoneal-injection; toxicity; olfactory-organs; adverse-effects; histopathology; rats; toxicology- ; idpn

Abstract: The histopathology of the olfactory mucosal lesion associated with ip administration of 2,6-dichlorobenzonitrile (dichlobenil) and 3,3'-iminodipropionitrile (IDPN) has been well documented. Whether there is an olfactory deficit associated with the partial loss of the olfactory mucosa (localized around the dorsal medial meatus of the nasal cavity) has yet to be determined. Dichlobenil (100 mg/kg) or IDPN (200 mg/kg) was administered ip to adult male Long-Evans rats previously trained in an olfactory task to find a food pellet buried in approximately 7.5 cm of bedding in a 0.61 X 1.2 X 0.61-m Plexiglass chamber. As a positive control, another group received 300 mg/kg ip of 1-methyl-2-mercaptoimidazole (methimazole), a dosing regimen which destroys nearly all of the olfactory mucosa. All three compounds caused a transient increase in the mean latency to find the pellet, with the magnitude of the effect positively correlated with the extent of the olfactory lesion. In order to determine whether these deficits resulted from olfactory dysfunction or impaired cognitive function (a deficit previously attributed to IDPN exposure), another group of rats was dosed as above and tested in another spatial memory task, the Morris water maze (MWM), which is less dependent upon olfactory function. No performance deficit was detected in the MWM. These data suggest that the transient olfactory deficit in the dichlobenil-, IDPN-, and methimazole-treated rats is attributable to defective olfactory function.

38 NAL Call No.: 41.8-V6456

Children's pets (excluding the rabbit).

Taylor, N. R. *Vet-Annu* (30): p.335-341. (1990)

Descriptors: hamsters; golden-hamsters; cricetus; phodopus; gerbils; meriones-libycus; meriones-unguiculatus; guinea-pigs; mice; mus-musculus; rats; rattus-norvegicus; pet-care; anesthesia; antibiotics; dosage; water-intake; antifungal-agents; antiparasitic-agents; cricetus-cricetus; cricetus-griseus; phodopus-sungons

39 NAL Call No.: 410.9-P94

Chronic bile duct cannulation in laboratory rats.

Rolf, L. L. Jr.; Bartels, K. E.; Nelson, E. C.; Berlin, K. D. *Lab-Anim-Sci* v.41(5): p.486-492. (1991 Oct.)

Includes references.

Descriptors: rats; bile-ducts; cannulation; survival; bile; flow; pressure; secretory-pressure

Abstract: To our knowledge this is the first report of rat bile duct cannulations in which the distal cannula is hemisected but extends to the sphincter of Oddi. It is minimally invasive and requires only about 45 minutes preparation time. In contrast to studies described in the literature, enterohepatic recirculation remains intact but bile can always be separated from pancreatic secretions at investigator discretion in the model. In addition, biliary flow and pressure can be measured without compromise. Acute biliary secretory pressure, under anesthesia, was 17 cm water. Bile flow, averaging 9.6 microliter/min/100g was measured in unanesthetized rats surviving for 2 weeks (60% of animals monitored). Gross necropsy findings indicated that animals dying in less than 7 days usually suffered bile peritonitis subsequent to catheter rupture of the bile duct or loss from the ligature restraint. Deaths after 2 weeks were usually related to cholestasis due to blockage of the catheter with mineral debris and/or duct tissue. A detailed literature review of bile duct cannulation in rats has been made.

40 NAL Call No.: 447.8-Am3

Chronic food restriction and acute food deprivation decrease mRNA levels of opioid peptides in arcuate nucleus.

Kim, E. M.; Welch, C. C.; Grace, M. K.; Billington, C. J.; Levine, A. S. *Am-j-physiol* v.270(5,pt.2): p.R1019-R1024. (1996 May)

Includes references.

Descriptors: food-restriction; food-deprivation; food-intake; enkephalins; opioid-peptides; messenger-rna; gene-expression; hypothalamus; rats; proenkephalins; prodynorphins; proopioidmelanocortin

Abstract: Although opioid administration induces food intake, the relationship between endogenous opioid synthesis and food consumption is unclear. Two studies examined the effects of food restriction and deprivation on opioid mRNA levels in the arcuate nucleus (ARC) of the rat. Body weight significantly decreased following food restriction and deprivation ($P < 0.0001$). In experiment 1, food restriction of 10, 20, 30, and 40% (g) of ad libitum intake for 14 days decreased proDynorphin (proDyn), proEnkephalin (proEnk), and proOpioidmelanocortin (POMC) mRNA levels in a linear fashion relative to changes in body weight ($r = 0.398$, $P = 0.011$; $r = 0.455$, $P = 0.0028$; $r = 0.292$, $P = 0.0642$, respectively). In experiment 2, 48 h deprivation significantly decreased mRNA levels of proDyn and POMC by 23.7% ($P < 0.05$) and 45.6% ($P < 0.01$), respectively, whereas 24 h food deprivation decreased POMC mRNA by 43.0% ($P < 0.01$). proEnk mRNA was not affected by 24- or 48-h food deprivation. Restricting food intake suppressed mRNA levels of proDyn, proEnk, and

POMC by 29.7, 22.3, and 44.4%, respectively, in 20% restricted rats and by 35.5, 26.8, and 45.6%, respectively, in 40% restricted rats ($P < 0.01$). It appears that ARC mRNA levels of proDyn, proEnk, and POMC are directly related to the amount of food consumed and/or changes in body weight in food-restricted and food-deprived rats.

41 NAL Call No.: RC620.A1N8

Chronic noise and water restriction as stress models in relation to food and water intake and hormonal profiles in adult male rats.

Armario, A.; Castellanos, J. M.; Balasch, J. *Nutr-Rep-Int* v.28(6): p.1333-1339. (1983 Dec.)

Includes references.

42 NAL Call No.: 410.9-P94

Chronic sialodacryoadenitis virus (SDAV) infection in athymic rats.

Hajjar, A. M.; DiGiacomo, R. F.; Carpenter, J. K.; Bingel, S. A.; Moazed, T. C. *Lab-Anim-Sci* v.41(1): p.22-25. (1991 Jan.)

Includes references.

Descriptors: rats; sialodacryoadenitis-virus; thymus-gland; chronic-infections; symptoms; histopathology; outbreaks

Abstract: Sialodacryoadenitis virus (SDAV) was detected in athymic rats subcutaneously implanted with human tumor cell lines. Clinical signs included sneezing, dyspnea, weight loss and death. Necropsy revealed both upper and lower respiratory tract disease from which *Staphylococcus aureus*, *Pasteurella pneumotropica* and *Pseudomonas aeruginosa* were recovered. Histopathological changes consisted of suppurative rhinitis and bronchopneumonia. Lesions characteristic of SDAV infection were found in lacrimal and salivary glands, and viral antigens were detected in the salivary glands and respiratory tract by immunohistochemistry. Submaxillary salivary gland, Harderian gland and lung homogenates from affected athymic rats were inoculated intranasally into euthymic rats as a rat antibody production test. All euthymic rats seroconverted to SDAV. Seroconversion to SDAV was demonstrated in consecutive pairs of sentinel euthymic rats housed for 6 months with infected athymic rats. Inoculation of supernatants of the original tumor cell lines into euthymic rats did not result in seroconversion. The source of the virus was not determined. In this study, spontaneously acquired SDAV infection persisted for at least 6 months in athymic rats.

43 NAL Call No.: QD415.A1B52

Circadian changes in glycogen content in rat interscapular brown adipose tissue: effect of cold exposure and food deprivation.

Felipe, A.; Lopez Soriano, F. J. *Biochem-Int* v.21(3): p.537-543. (1990 July)

Includes references.

Descriptors: fasting; cold-stress; brown-fat; circadian-rhythm; glycogen; lipids; liver; glucose; insulin

44 NAL Call No.: 447.8-Am3

Circadian rhythms of temperature and activity in obese and lean Zucker rats.

Murakami, D. M.; Horwitz, B. A.; Fuller, C. A. *Am-j-physiol* v.269(5,pt.2): p.R1038-R1043. (1995 Nov.)

Includes references.

Descriptors: obesity; energy-metabolism; energy-balance; circadian-rhythm; body-temperature; physical-activity; rats

Abstract: The circadian timing system is important in the regulation of feeding and metabolism, both of which are aberrant in the obese Zucker rat. This study tested the hypothesis that these abnormalities involve a deficit in circadian regulation by examining the circadian rhythms of body temperature and activity in lean and obese Zucker rats exposed to normal light-dark cycles, constant light, and constant dark. Significant deficits in both daily mean and circadian amplitude of temperature and activity were found in obese Zucker female rats relative to lean controls in all lighting conditions. However, the circadian period of obese Zucker rats did not exhibit differences relative to lean controls in either of the constant lighting conditions. These results indicate that although the circadian regulation of temperature and activity in obese Zucker female rats is in fact depressed, obese rats do exhibit normal entrainment and pacemaker functions in the circadian timing system. The results suggest a deficit in the process that generates the amplitude of the circadian rhythm.

45 NAL Call No.: QL55.A1L33

Clinical management of spontaneous diabetes mellitus in the BB rat.

Olson, G. A.; Toth, L.; Hinson, A.; Bursi, J. *Lab-Anim* v.19(2): p.31-34. (1990 Mar.)

Includes references.

Descriptors: rats; diabetes-mellitus; laboratory-rearing; drug-therapy; medical-treatment; insulin

46 NAL Call No.: QL55.F43-1993

Combined mapping of DNA markers (SSLP) and biochemical markers in the rat.

Otsen, M.; Bieman, M. d.; Jacob, H. J.; Zutphen, L. F. M. v. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 421-423.*

Poster presentation at the symposium.

Descriptors: rats; microsatellites; genetic-markers; recombination; linkage; gene-mapping

47 NAL Call No.: SF405.5.A23

Comparative effects of forced-air, individual cage ventilation or an absorbent bedding additive on mouse isolator cage microenvironment.

Huerkamp, M. J.; Lehner, N. D. M. *Contem-top-lab-anim-sci* v.33(2): p.58-61. (1994 Mar.)

Includes references.

Descriptors: mice; cages; microenvironments; artificial-ventilation; litter; ammonia; temperature; relative-humidity; carbon-dioxide; methane; hydrogen-sulfide; hydrophilic-polymer-bedding-additives

48 NAL Call No.: 410.9-P94

A comparison of euthanasia methods in rats, using carbon dioxide in prefilled and fixed flow rate filled chambers.

Hewett, T. A.; Kovacs, M. S.; Artwohl, J. E.; Bennett, B. T. *Lab-anim-sci* v.43(6): p.579-582. (1993 Dec.)

Includes references.

Descriptors: rats; euthanasia; carbon-dioxide; animal-welfare; methodology; blood; gases; animal-behavior

Abstract: The two methods (prefilled and fixed flow rate filled chambers) recommended in the 1993 AVMA Euthanasia Panel report for using carbon dioxide to euthanize rats were evaluated in terms of their effect on behavior and selected blood gas values. Responses were videotaped during exposure to greater than or equal to 90% carbon dioxide in a prefilled chamber or a gradually filled chamber, using a fixed flow rate of 20% chamber volume/min. Arterial blood samples were taken to determine partial pressure of oxygen, partial pressure of carbon dioxide, pH, and oxygen saturation prior to entering the chamber and at time points determined by rats' responses to carbon dioxide. Rats showed similar reactions when exposed to carbon dioxide by either method. Significant differences in mean time for each response to occur were seen between euthanasia methods. Maintaining a near atmospheric oxygen chamber concentration by using a 75% CO₂:20% O₂:5% N₂ gas mixture to gradually fill the chamber did not change rats' reactions upon exposure. Significant differences were found between pre-exposure values and values from samples obtained when rats became immobile after entering the prefilled chamber. Partial pressure of carbon dioxide significantly increased, and pH and percent oxygen saturation significantly decreased from pre-exposure values in all samples obtained after rats entered the gradually filled chamber. Partial pressure of oxygen in these rats was greater than or equal to pre-exposure levels in all samples. Rats appeared sedated because of the anesthetic effects of carbon dioxide when immobility was observed. Distress was not observed in the rats when either method of euthanasia.

49 NAL Call No.: QL55.A1L3

Comparison of gavage, water bottle, and a high-moisture diet bolus as dosing methods for quantitative D-xylose administration to B6D2F1 (Mus musculus) mice.

Zimmer, J. P.; Lewis, S. M.; Moyer, J. L. *Lab-Anim* v.27(2): p.164-170. (1993 Apr.)

Includes references.

Descriptors: mice; drug-delivery-systems

Abstract: Gavage, water bottle, and diet incorporation are 3 dosing methods used orally to administer test compounds to rodents. These 3 methods were compared in mice to determine which represented the most quantitative delivery system. For dietary incorporation, a high-moisture bolus form of NIH-31 rodent meal was developed using hydroxypropyl methylcellulose as an autoclave-stable binding agent. A high-moisture bolus was selected to increase the acceptability of the dosed diet and to promote quantitative consumption through reduced wastage. The test compound used was D-xylose, a pentose sugar that may be quantitatively detected, colorimetrically, in urine following oral dosing. Six male and 6 female B6D2F1 mice were placed in metabolism cages and dosed with a known quantity of D-xylose by each of the 3 methods. Urine was collected before and after each method of administration and analysed for total D-xylose; the per cent recovery

was based upon the amount of D-xylose consumed. Quantitative consumption was apparently greatest for water bottle dosing with an average recovery of 56.0% of the original D-xylose dose. High-moisture bolus incorporation ranked second with 56.0% D-xylose recovery, and gavage was third with 41.0% D-xylose recover.

50 NAL Call No.: 410.9-P94

A comparison of rodent caging systems based on microenvironmental parameters.

Corning, B. F.; Lipman, N. S. *Lab-Anim-Sci* v.41(5): p.498-503. (1991 Oct.)

Includes references.

Descriptors: mice; cages; environmental-temperature; carbon-dioxide; relative-humidity; ammonia

Abstract: Four different mouse caging systems were evaluated for microenvironmental temperature, carbon dioxide, relative humidity (RH) and ammonia levels during a 7-day testing period. All caging systems evaluated had polycarbonate bases and consisted of either a molded polyester (MP) filter lid, one of two different polycarbonate filter lids, or no filter lid which served as a control. At 50% macroenvironmental RH (study I), all systems maintained an intracage temperature of 75.5 degrees F +/- 0.5 degrees. Both polycarbonate systems averaged > 2200 ppm of carbon dioxide more than the MP system and the controls. When compared with RH in the control cages, RH levels averaged over 20% and 5 to 8% RH greater in the polycarbonate filter lid systems and the MP system, respectively. There were no appreciable ammonia levels in either the MP or control systems. In the polycarbonate filter lid systems, ammonia levels were detectable on day 4 and were > 200 ppm by day 6. At 20% macroenvironmental RH (study II), there was a proportional 15 to 30% RH decrease from study I levels. Ammonia levels were undetectable in any system until day 7 and averaged only 17 ppm in one of the polycarbonate systems. Minimal differences were observed in studies III, IV and V when pine shavings were used instead of hardwood chips, a CD-1 stock instead of a DBA/2J strain, and different grades of filter inserts in the polycarbonate systems, respectively.

51 NAL Call No.: 410.9-P94

Comparison of the effects of five adjuvants on the antibody response to influenza virus antigen in guinea pigs.

Robuccio, J. A.; Griffith, J. W.; Chroscinski, E. A.; Cross, P. J.; Light, T. E.; Lang, C. M. *Lab-anim-sci* v.45(4): p.420-426. (1995 Aug.)

Includes references.

Descriptors: guinea-pigs; adjuvants; influenzavirus; immunostimulants; viral-hemagglutinins; lesions; intramuscular-injection; antibody-formation; swelling; histopathology; animal-welfare

Abstract: Five adjuvants were tested for their effect on the immune response in guinea pigs to the hemagglutinin antigen of influenza virus strain B/Panama. Vaccines containing 924 micrograms of hemagglutinin antigen/ml were prepared at high and low doses of Freund's complete and incomplete adjuvants, Syntex adjuvant, RIBI's adjuvant, TiterMax adjuvant, and aluminum phosphate adjuvant. Responses to these vaccines were compared with those to a control vaccine containing influenza virus B/Panama hemagglutinin antigen and saline. On day 28, vaccines containing the following adjuvant doses had significantly higher titers than the titer for the control: Freund adjuvants at high and low doses, RIBI at high dose, TiterMax at high and low doses, and aluminum phosphate at high dose. On day 42, vaccines containing the following adjuvant doses had significantly higher titers than that for the control: Freund adjuvants at high and low doses, RIBI at high dose, TiterMax at high dose, and aluminum phosphate at high dose. Freund adjuvants at high and low doses, RIBI adjuvant at high dose, and aluminum phosphate at high dose caused significantly greater swelling at the inoculation site than did the control vaccine. TiterMax adjuvant at high and low doses, and aluminum phosphate at low dose caused minor swelling at the inoculation site, but it was not significantly different from the swelling caused by the control vaccine. Syntex adjuvant at high and low doses, RIRI at low dose, and control (saline/antigen) at high and low doses caused no swelling after inoculation. Overall, the high dose of adjuvants caused greater tissue swelling than did the low dose of adjuvants. Histologically, myositis; TiterMax caused necrotizing pyogranulomatous myositis; and aluminum phosphate induced necrotizing granulomatous myositis. TiterMax at high dose was the only vaccine combination that resulted in significantly higher titer to influenza virus antigen than the titer to the control (saline/antigen) vaccine and did not cause significantly greater swelling in response to inoculation than did the control vaccine.

52 NAL Call No.: QL55.I5

Comparisons of individually housed male mice with those kept in small groups in a food competition situation.

Bartos, L.; Brain, P. F.; Donat, P. *Anim-technol* v.45(2): p.101-110. (1994 Aug.)

Includes references.

Descriptors: mice; laboratory-rearing; group-size; isolation; social-behavior; aggressive-behavior; animal-behavior; animal-competition

53 NAL Call No.: QP141.A1A64

Conditioned preferences for the taste and odor components of flavors: blocking but not overshadowing.

Holder, M. D. *Appetite* v.17(1): p.29-45. (1991 Aug.)

Includes references.

Descriptors: food-preferences; taste; odors; flavor; sucrose; food-deprivation; conditioning; appetite; theory; validity; rats

Abstract: Sprague-Dawley rats were given two water bottles. One bottle contained sucrose and the other did not. Distinctive odors and/or tastes were paired with sucrose or plain water solutions. Preferences for the odor and taste were then measured under iso-caloric conditions when the rats were and were not food deprived. The rats preferred the odor or taste that had previously been paired with sucrose. The strength of this preference increased when the rats were food deprived suggesting that the effect was calorie mediated. The development of a preference to the odor or taste was not affected by the addition of a taste or odor; there was no evidence of overshadowing. Conditioned taste and odor preferences were partially blocked by prior pairing of the odor or taste with sucrose. The absence of overshadowing, but not the presence of blocking, was predicted by a theory of associative learning which treats odors as conditioned stimuli, tastes as unconditioned stimuli and ingestional consequences (e.g. calories or illness) as a new category referred to as feedback.

54 NAL Call No.: QL55.A1L33

Containment of a mouse hepatitis virus outbreak to a single facility at a large multi-site research university.

Potter, M.; Borkowski, G.; Carey, D. *Lab-anim* v.25(1): p.36-39. (1996 Jan.)

Includes references.

Descriptors: mice; murine-hepatitis-virus; disease-control

55 NAL Call No.: 410.9-P94

Convulsions in senescence-accelerated mice (SAM-R/1/Eis).

Yamazaki, K.; Kumazawa, A.; Ito, K.; Kurihara, K.; Nakayama, M.; Wakabayashi, T. *Lab-Anim-Sci* v.42(4): p.378-381. (1992 Aug.)

Includes references.

Descriptors: mice; animal-models; convulsions; aging

Abstract: Senescence-accelerated mice (SAM) are one of the animal models used for studying senescence, which consist of several substrains such as SAM-R/1, R/2, P/1, P/2. SAM-R/1/Eis maintained in Eisai Tsukuba Research Laboratories, Ibaraki, Japan, was originally introduced as a substrain of a normal control SAM-R/1 from Kyoto University, Japan. We have noted signs of convulsions in SAM-R/1/Eis mice during routine animal care, particularly while changing cages. We identified the clinical signs and determined the concentrations of glucose and immunoreactive insulin in plasma of SAM-R/1/Eis mice. There were no differences in the male:female ratios of mice showing prodrome only, grand mal, or no-signs. The ages at which prodrome and grand mal were first noted peaked between 20 and 25 weeks. Concentrations of glucose and immunoreactive insulin in plasma did not indicate the mice were in insulin hypoglycemia, which is one cause of convulsions. AKR strain mice, some of which originated with the SAM strain are known to become convulsive by repeated "throwing" stimulations. Conversely, in SAM-R/1/Eis, throwing stimuli are not needed to cause convulsive signs. Thus it is likely that in SAM-R/1/Eis mice the signs are triggered by repeating mild environmental changes, such as changing cages. The results of this study show that SAM-R/1/Eis is neither a normal control strain, nor an original SAM-R/1 strain. But it is possible that SAM-R/1/Eis is another useful animal model for studying spontaneous convulsion.

56 NAL Call No.: 410.9-P94

Coronavirus-like virions associated with a wasting syndrome in guinea pigs.

Jaax, G. P.; Jaax, N. K.; Petrali, J. P.; Corcoran, K. D.; Vogel, A. P. *Lab-Anim-Sci* v.40(4): p.375-378. (1990 July)

Includes references.

Descriptors: guinea-pigs; coronavirus; feces; weight-losses; diarrhea; viral-diseases

Abstract: An apparent wasting syndrome was observed in newly arriving 3 to 4 week old guinea pigs characterized by anorexia, weight loss, diarrhea, perineal staining and death. Diagnostic efforts to attribute the disease to husbandry, environmental factors or to known guinea pig pathogens were unsuccessful. Clinical signs, enteric histopathological lesions

and diagnostic transmission electron microscopy identification of typical coronavirus-like virions in fecal samples were consistent with enteric coronaviral diseases seen in other species.

57 NAL Call No.: QL55.A1L3

Corticosterone, adrenal and spleen weight in mice after tail bleeding, and its effect on nearby animals.

Tuli, J. S.; Smith, J. A.; Morton, D. B. *Lab-anim* v.29(1): p.90-95. (1995 Jan.)

Includes references.

Descriptors: mice; stress; blood-sampling; tail; corticosterone; adrenal-glands; spleen; weight; exposure

Abstract: Experiments were performed in mice to study if stress was involved in tail bleeding and to investigate any transmittable signal at killing. A second study looked at the time taken to recover from stress elicited by these procedures. Corticosterone levels were significantly higher in mice immediately after the completion of tail bleeding than in control mice ($P<0.05$) suggesting that tail bleeding in mice was stressful. This study did not show any evidence for an odour or sound being released during killing or tail bleeding as there was no significant effect on corticosterone levels in mice present in the same room at the time these procedures were carried out. Corticosterone levels in mice killed on days 1, 3, and 7 after tail bleeding were significantly lower ($P<0.05$) than the average corticosterone level in tail blood on day 1, indicating that mice recovered within 24 h from the stress of tail bleeding.

58 NAL Call No.: aHV4701.A952

The cotton rat in biomedical research.

Prince, G. A. *Animal-Welf-Inf-Cent-newsl* v.5(2): p.3-5. (1994 Summer)

Descriptors: sigmodon; medical-research; animal-experiments; disease-models; animal-husbandry

59 NAL Call No.: SF405.5.C36

Cotton rats in the research environment or "White rats can't jump".

Boyer, L. *Can-Assoc-Lab-Anim-Sci-newsl* v.28(6): p.180-181. (1994 Dec.)

Descriptors: sigmodon-hispidus; laboratory-rearing; animal-husbandry; animal-breeding; cages; enrichment; anesthesia

60 NAL Call No.: 410-B77

Courtship ultrasonic vocalizations and social status in mice.

D'Amato, F. R. *Anim-Behav* v.41(pt.5): p.875-885. (1991 May)

Includes references.

Descriptors: mice; vocalization; mating-behavior; social-status; reproductive-performance; inhibition; urine; biological-competition

Abstract: A series of experiments was conducted to investigate whether the poorer sexual performance of subordinate than dominant male mice, *Mus domesticus*, was linked to lower sexual motivation. Ultrasonic calls uttered by a male in the presence of a female were used as an index of sexual interest. Males were housed in pairs for 5 days and dominant/subordinate roles were assigned. Subordinates, when tested in their home cage immediately after the removal of the dominant male, uttered more ultrasounds than the latter. When the dominant males was tested before the subordinate, there was no difference in the number of ultrasounds uttered and the subordinates' performance was consistently poorer. The fewer calls recored when subordinate males were tested after the dominant partner was not associated with less defence/escape behaviour, nor could it be explained as habituation to female odour, as a consequence of being tested after the dominant partner. Within sexually experienced pairs, the urine of dominant males in interacting with a female for 3 min reduced the number of ultrasounds uttered by the subordinate in the presence of a female. It is suggested that an inhibitory factor in the dominant male's urine functions as an indirect competitive mechanism when direct competition is prevented by removing the dominant subject.

61 NAL Call No.: 410.9-P94

Decontamination of rat embryos and transfer to specific pathogen-free recipients for the production of a breeding colony.

Rouleau, A. M. J.; Kovacs, P. R.; Kunz, H. W.; Armstrong, D. T. *Lab-anim-sci* v.43(6): p.611-615. (1993 Dec.)

Includes references.

Descriptors: rats; germfree-state; germfree-animals; decontamination; embryos; superovulation; embryo-transfer; trypsin

Abstract: When animals are introduced to a specific pathogen-free (SPF) facility, care must be taken to avoid the possibility of disease transmission to the local colony. This study investigated the application of a combination of reproductive biotechnologies to establish a new disease-free colony of two rat strains, DarkAgouti(Da/Pit) and Wistar Furth(WF/Pit), from a stock known to be chronically infected with the following

62 NAL Call No.: QL55.J55

Deodorization of laboratory animal facilities by ozone.

Pan, T. M.; Shimoda, K.; Cai, Y.; Kiuchi, Y.; Nakama, K.; Akimoto, T.; Nagashima, Y.; Kai, M.; Ohira, M.; Saegusa, J. *Exp-anim* v.44(3): p.255-259. (1995 July)

Includes references.

Descriptors: laboratories; odor-abatement; ozone; ammonia; trimethylamine; rats; guinea-pigs

63 NAL Call No.: QD1.A45

Dermal absorption and disposition of formulations of malathion in Sprague-Dawley rats and humans.

Dary, C. C.; Blancato, J. N.; Castles, M.; Reddy, V.; Cannon, M.; Saleh, M. A.; Cash, G. G. *ACS-symp-ser* (542): p.231-263. (1994)

In the series analytic: Biomarkers of human exposure to pesticides / edited by M.A. Saleh, J.N. Blancato, and C.H. Nauman. Paper presented at the 204th National Meeting of the American Chemical Society, August 23-28, 1992, Washington, D.C.

Descriptors: malathion; formulations; toxicity; skin; exposure; absorption; metabolism; excretion; man; rats

Abstract: Dermal absorption of neat malathion, a 50% emulsifiable concentrate (50% EC), and a 1% and 10% aqueous mixture of the 50% EC formulation was examined in human volunteers. The absorption and elimination profiles of [14C]-malathion equivalents in the urine of the human were compared with the rat. Constants of absorption and elimination were calculated. Distribution of [14C]-malathion equivalents in selected tissues were examined in the rat. The 50% EC formulation was absorbed as readily as the neat malathion. The absorption of the organic based formulations was influenced by the increase in the surface area of the site of application. The total cumulative absorption was concentration dependent. The rate of absorption of the neat malathion, the 50% EC formulation, and 10% aqueous mixture was less than the rate of elimination resulting in a depletion of the body burden. The rate of absorption and elimination of the 1% aqueous mixture were coincident. The elimination of malathion was efficient and independent of surface area, concentration, and formulation. The disposition of malathion favored organs of metabolism and elimination, liver and kidney. A substantial portion of the dose remained at the site of application. The results suggest that acute human toxicity could occur from handling the concentrate when a substantial portion of the exposed skin is contaminated. Acute toxicity from contact with surfaces treated with the aqueous mixtures would be unlikely. Repeated exposure, however, could burden organs of metabolism and elimination, skin, liver and kidney.

64 NAL Call No.: QL750.A6

Description and validation of a preference test system to evaluate housing conditions for laboratory mice.

Blom, H. J. M.; Vorstenbosch, C. J. A. H. V. v.; Baumans, V.; Hoogervorst, M. J. C.; Beynen, A. C.; Zutphen, L. F. M. v. *Appl-Anim-Behav-Sci* v.35(1): p.67-82. (1992 Oct.)

Includes references.

Descriptors: mice; animal-housing

65 NAL Call No.: QL750.A6

Development and application of a preference test system to evaluate housing conditions for laboratory rats.

Blom, H. J. M.; Tintelen, G. v.; Baumans, V.; Broek, J. v. d.; Beynen, A. C. *Appl-anim-behav-sci* v.43(4): p.279-290. (1995 July)

Includes references.

Descriptors: rats; cages; height; light-intensity; tests; animal-welfare

66 NAL Call No.: QL55.I5

The development of a pheromone isolation and delivery (PID) system for small mammals.

Schank, J. C.; Tomasino, C. I.; McClintock, M. K. *Anim-technol* v.46(2): p.103-113. (1995 Aug.)

Includes references.

Descriptors: rats; pheromones; isolation; systems; environmental-control; air-flow; animal-housing; litter; isolation-units

67 NAL Call No.: QL55.F43-1993**The development of a powdered-diet food hopper for hamsters.**

Fisher, R. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 442-444.*

Poster presentation at the symposium.

Descriptors: hamsters; feed-intake; liveweight-gain; feed-dispensers

68 NAL Call No.: QH313.C65**Development of an animal genome database and its search system.**

Wada, Y.; Yasue, H. *Comput-appl-biosci* v.12(3): p.231-235. (1996 June)

Includes references.

Descriptors: pigs; cattle; mice; man; genome-analysis; gene-mapping; databases; information-retrieval; information-services; internet; electronic-mail; comparative-gene-mapping

Abstract: An animal genome database has been developed on a Unix workstation and maintained by a relational database management system. This database has focused on the comparative gene mapping between species to assist the mapping of the genes related to phenotypic traits in livestock. The linkage maps, cytogenetic maps, polymerase chain reaction primers of pig, cattle, mouse and human, and their references have been included in the database, and the correspondence among species have been stipulated in the database. In order to search the database effectively, the World Wide Web server (<http://ws4.niai.affrc.go.jp/>) and the electronic mail server system (e-mail: jgbase-mail@niai.affrc.go.jp) have been developed on different Unix workstations. These servers are connected to the Internet.

69 NAL Call No.: QP141.A1A64**Development of tolerance to endogenous opiates activated by 24-h food deprivation.**

Davidson, T. L.; McKenzie, B. R.; Tujo, C. J.; Bish, C. K. *Appetite* v.19(1): p.1-13. (1992 Aug.)

Includes references.

Descriptors: food-deprivation; opioid-peptides; temperature; stimulation; pain; tolerance; rats

Abstract: Four experiments assessed the effects of exposure to 24-h food deprivation on the tail-flick latency of rats exposed to a temperature stimulus. Confirming previous studies, Experiment 1 showed that food deprivation gave rise to analgesia, as indicated by increased tail-flick latencies, that was antagonized by naloxone. Experiment 2 found that analgesia was greatly reduced after five exposures to periods of 24-h food deprivation (alternating with 24-h free access to food), indicating the development of tolerance. Experiments 3 and 3a examined the development of tolerance to the analgesic effects of morphine following repeated morphine injections, saline injections, and exposure to 24-h food deprivation plus saline injections. The combined results of both experiments provided evidence that repeated exposures to either morphine or food deprivation, produced greater tolerance to morphine than did exposures to saline. That food deprivation was cross-tolerant with morphine indicated that tolerance to food deprivation-induced analgesia involved opioid mechanisms. The relevance of opioid tolerance to psychobiological models of feeding and to the development of an animal model of anorexia nervosa was discussed.

70 NAL Call No.: 410.9-P94**Diagnostic exercise: ophthalmitis in nude mice housed in ventilated micro-isolator cages.**

Griffin, H. E.; Boyce, J. T.; Bontempo, J. M. *Lab-anim-sci* v.45(5): p.595-596 (1995 Oct.)

Includes references.

Descriptors: mice; eyelids; pathology; eyes; cellulosic-fibers; hair; mutants; laboratory-rearing; diagnosis; litter

71 NAL Call No.: QP901.A33-v.371**Dietary antigen handling by mother and offspring in a two generation study.**

Telemo, E.; Dahlgren, U.; Hanson, L. A.; Wold, A. *Advances in mucosal immunology / . New York : Plenum Press, c1995.. p. 517-519.*

Paper presented at the 7th International Congress of Mucosal Immunology, August 16-21, 1992, Prague, Czechoslovakia.

Descriptors: diet; antigens; beta-lactoglobulin; ovalbumin; tolerance; immunity; maternal-fetal-exchange; rats

72 NAL Call No.: 389.8-J82

Dietary arginine deficiency alters flux of glutamine and urea cycle intermediates across the portal-drained viscera and liver of rats.

Hartman, W. J.; Prior, R. L. *J-Nutr* v.122(7): p.1472-1482. (1992 July)

Includes references.

Descriptors: diet; nutrient-deficiencies; arginine; glutamine; citrulline; metabolism; liver; rats

Abstract: The effect of an arginine-deficient diet on net flux of amino acids across the portal-drained viscera and across the liver was studied in rats. Blood was obtained after food deprivation and 1 and 2 h after a meal of a 1.0% arginine control diet or an arginine-deficient diet containing 3.4% glutamate. The arginine-deficient diet decreased net portal-drained viscera flux of arginine and increased net portal-drained viscera flux of ornithine and proline. However, net portal-drained viscera flux of citrulline (0.35 +/- 0.05 micromole/min) was not influenced by diet; of this rate, 46% (0.16 micromole/min) bypassed the liver and was available for extrahepatic arginine synthesis. However, rats continued to exhibit signs of arginine deficiency such as decreased blood arginine concentrations (by 28%) and increased orotic acid excretion (90-fold). Arterial blood glutamine concentration was 25% higher in rats fed the arginine-deficient diet. In the fed state, net hepatic flux of glutamine was elevated from 0.15 (control) to 1.39 micromoles/min, indicating that the liver was a major source of the increased blood glutamine concentrations. Increased production of hepatic glutamine and orotic acid may help rats compensate for dietary arginine deficiency, whereas splanchnic output of citrulline was not increased with dietary arginine deficiency even with a substantial dietary supply of glutamate.

73 NAL Call No.: 447.8-AM3**Dietary control of the lactase mRNA distribution along the rat small intestine.**

Duluc, I.; Galluser, M.; Raul, F.; Freund, J. N. *Am-J-Physiol* v.262(6,pt.1): p.G954-G961. (1992 June)

Includes references.

Descriptors: diet; beta-galactosidase; beta-fructofuranosidase; hydrolases; messenger-rna; transcription; enzyme-activity; distribution; suckling; weaning; jejunum; ileum; ontogeny; young-animals; adults; rats; lactase-phlorizin-hydrolase; longitudinal-distribution

Abstract: At weaning, the lactase-phlorizin hydrolase (LPH) mRNA was shown to disappear specifically from the distal part of ileum while remaining abundant in the more proximal segments of the small intestine. The purpose of this study was to analyze the longitudinal distribution of this transcript in rats whose intestinal lumen content was modified before and after weaning. Preweaned animals force-fed with an artificial diet retained a high amount of LPH mRNA in the jejunum, whereas this transcript precociously decreased in the distal ileum. Conversely, prolonged nursing delayed the specific decay of the LPH mRNA in the latter segment. Food deprivation in preweaned animals did not alter the longitudinal distribution of this transcript in that it remained abundant in the distal ileum. In adult rats, rearranging the order of the small intestinal segments with regard to the intraluminal flow of nutrients did not modify the typical distribution of the LPH mRNA. These results suggest that switching over from milk to the adult-type diet at weaning contributes to the modification of the longitudinal distribution of the LPH mRNA that normally occurs at this stage. However, once the adult pattern of expression of this transcript is established, it cannot be significantly altered by changing the position of each intestinal segment as well as its luminal content.

74 NAL Call No.: 389.8-J82**Dietary fish oil does not alter glucose tolerance in conscious rats.**

Behme, M. T.; Dupre, J.; Holub, B. J.; Philbrick, D. J. *J-nutr* v.123(12): p.2085-2089. (1993 Dec.)

Includes references.

Descriptors: fish-oils; glucose-tolerance; supplements; eicosapentaenoic-acid; docosenoic-acids; phospholipids; liver; pancreas; pancreas-islets; blood-plasma; insulin; rats; docosahexaenoic-acid

Abstract: We examined the effect of dietary fish oil (MaxEPA) and sunflower seed oil on glucose tolerance in male Wistar rats. Semipurified diets containing 100 g oil/kg diet were administered for 30 d. The fish oil diet contained 26 g (n-3) fatty acids, 16 g eicosapentaenoic acid and 10.4 g docosahexaenoic acid/kg diet. Phospholipids from liver, pancreas, and pancreatic islets were enriched in eicosapentaenoic and docosahexaenoic acids by the fish oil diet. In unfed pentobarbital-anesthetized rats, both basal plasma insulin concentration and insulin responses to intravenous glucose were significantly lower for fish oil-fed rats although glucose responses were similar; however, incremental excursions in plasma insulin over the basal concentrations did not differ. Intravenous glucose tolerance was also examined in conscious unfed rats under minimal restraint. Responses of plasma glucose and insulin were similar for fish oil- and sunflower oil-fed groups.

Furthermore, in another experiment, intravenous glucose tolerance tests were similar for conscious rats provided with either 100 g fish oil or corn oil/kg nonpurified diet. Thus, glucose-induced insulin secretion is lower in rats fed fish oil than in rats fed sunflower oil, when tests are conducted in pentobarbital-anesthetized animals but not when tests are performed in conscious rats; there was no effect on plasma glucose in either anesthetized or nonanesthetized rats. Therefore, substitution of (n-3) for (n-6) polyunsaturated fatty acids in tissue phospholipids does not alter plasma glucose or insulin in conscious male Wistar rats.

75 NAL Call No.: 389.8-J82

Dietary (n-3) fatty acids affect rat heart, liver and aorta protective enzyme activities and lipid peroxidation.

L'Abbe, M. R.; Trick, K. D.; Beare Rogers, J. L. *J-Nutr* v.121(9): p.1331-1340. (1991 Sept.)

Includes references.

Descriptors: dietary-fat; saturated-fatty-acids; unsaturated-fatty-acids; aorta; heart; liver; enzyme-activity; glutathione-peroxidase; superoxide-dismutase; lipid-peroxidation; rats

Abstract: In a 16-wk study, weanling Wistar rats (32 males and 32 females) were fed a modified AIN-76 diet containing 20% fat with various (n-3) fatty acids. All dietary fats provided the same amount of saturates, monounsaturates, and total essential fatty acids [(n-6) + (n-3)]. The control diet contained lard/corn oil (L/CO). The other diets contained (n-3) fatty acids from linseed oil (LSO), from linseed oil + menhaden oil (LSO+MO) or from menhaden oil (MO). The (n-3) diets reduced total and HDL-cholesterol, particularly in rats fed the MO diet. Platelet thromboxane levels were equally depressed by the LSO and MO diets. Dietary (n-3) fatty acids significantly elevated docosahexaenoic acid in livers and hearts of male and female rats, with females reaching higher levels. This increase was accompanied by reduced arachidonic acid, except for hearts of females in which the major decrease was in linoleic acid. Overall, enzyme activities in the MO-fed group were decreased to the following levels (relative to the activity in the control group): heart Mn superoxide dismutase (SOD), 28%; liver CuZnSOD, 82%; aorta CuZnSOD, 32%. Greater reductions in these enzyme activities were seen in the female rats fed the MO diet compared with male rats. Lipid peroxidation, assessed by urinary, heart and liver thiobarbituric acid reactants, was increased by dietary (n-3) fatty acids (MO > LSO + MO > LSO > L/CO) and was higher in females than in males. These results indicate that enhanced lipid peroxidation occurs with the increased oxidative stress of elevated tissue (n-3) fatty acids accompanied by reduced SOD activity.

76 NAL Call No.: 447.8-AM3

Dietary obesity and weight cycling in rats: a model of stress-induced hypertension.

Contreras, R. J.; King, S.; Rives, L.; Williams, A.; Wattleton, T. *Am-J-Physiol* v.261(4,pt.2): p.R848-R857. (1991 Oct.)

Includes references.

Descriptors: obesity; hypertension; blood-pressure; heart-rate; stress; diet; body-weight; cycling; angiotensin; animal-models; rats

Abstract: The present study was designed to reproduce the mild hypertension seen in dietary obese weight-cycled rats [P. Ernsberger and D. O. Nelson. *Am. J. Physiol.* 254 (Regulatory Integrative Comp. Physiol 23): R47-R55, 1988] and determine whether this mild hypertension was associated with changes in sodium excretion and pressor responsiveness to angiotensin II (ANG II). Male Sprague-Dawley rats were fed pelleted chow (Pellet group) or chow plus sweetened condensed milk (Milk group) or were exposed to four cycles of a 4-day fast alternated with 2 wk of refeeding of pelleted chow and sweetened condensed milk (Cycled group). Blood pressure and heart rate were measured by tail cuff at the onset and last day of each fast and after 3 days of refeeding. During fasting, urine sodium excretion was measured. Mean arterial pressure and heart rate responses to intravenous administration of ANG II (40, 80, and 120 ng/kg), metoprolol (1 mg/kg), and methyl scopolamine (2 mg/kg) were obtained from the femoral artery in awake unrestrained rats. Weight cycling did not lead to mild hypertension or increased bradycardic response to sympathetic blockade with metoprolol. ANG II-elicited pressor responses were similar for Pellet, Milk, and Cycled groups. Sodium excretion did not change with fasting. Mild hypertension developed when obese weight-cycled rats were housed together in groups and not when housed individually. Our preliminary data are consistent with the notion that stress associated with group housing may be a factor in the mild hypertension of obese weight-cycled rats.

77 NAL Call No.: QP141.A1A64

Dietary restriction delays gastric emptying in rats.

Robinson, P. H.; Stephenson, J. S. *Appetite* v.14(3): p.193-201. (1990 June)

Includes references.

Descriptors: food-deprivation; stomach-emptying; body-weight; time-lag; animal-experiments; rats

Abstract: In rats allowed to eat for only 2 h per day, gastric emptying of three different meals [poached egg white, glucose (0.5 kcal/ml) and physiological saline, each labelled with 60 MBq of technetium-99 tin colloid visualized using a gamma camera] was markedly slowed 8 h after the last meal. Mean body weight in rats on the restricted feeding schedule was 80% of the weight of free-feeding controls. Gastric emptying curves for all three meals in controls were best described using log, transformed counts. Other models used were linear and square root. For each of the three meals, the percentage remaining in the stomach at 120 min was estimated using linear regression of gastric contents, transformed if necessary to yield the best curve against time. At 120 min, % gastric contents (mean + SEM) were 19.5 +/- 5.6 (egg), 15.5 +/- 6.27 (glucose) and 27.1 +/- 7.48 (saline) in control rats. After 4 months restriction, the corresponding figures were 75.2 +/- 4.04, 81.5 +/- 4.75 and 70.3 +/- 5.83. After 3 months of free feeding, emptying rates of the three meals were not significantly different from control values. We conclude that dietary restriction causes profound changes in gastric emptying by unknown mechanisms which may be operating in patients with anorexia nervosa.

78 NAL Call No.: 447.8-Am3

Dissociation of paraventricular NPY release and plasma corticosterone levels in rats under food deprivation.

Yoshihara, T.; Honma, S.; Katsuno, Y.; Honma, K. I. *Am-j-physiol* v.271(2,pt.1): p.E239-E245. (1996 Aug.)

Includes references.

Abstract: Extracellular neuropeptide Y (NPY) in the vicinity of the paraventricular nucleus (PVN) as well as NPY concentrations in the PVN were measured in rats under ad libitum feeding and 2-day and 10-day food deprivation. Plasma corticosterone levels were not changed by 2-day food deprivation but were increased by subsequent refeeding. In contrast, the extracellular NPY levels were increased by 2-day food deprivation and were decreased rapidly by refeeding. The NPY concentrations were also increased and increased further by refeeding. On the other hand, plasma corticosterone levels were elevated by 10-day food deprivation and were decreased by subsequent refeeding. The extracellular NPY levels were also increased by food deprivation and decreased gradually after refeeding. However, the postprandial levels were still elevated when plasma corticosterone levels were returned to the basal levels. The NPY concentrations were also increased and increased further by refeeding. The amount of food intake after refeeding was positively correlated with the extracellular NPY levels. It is concluded that extracellular NPY levels in the PVN do not necessarily covariate with plasma corticosterone levels in rats under food deprivation.

79 NAL Call No.: QL55.F43-1993

DNA fingerprinting of inbred and outbred strains of mice and rats as a genetic monitoring tool.

Deeny, A. A.; Russell, R. J.; Johnson, A.; Jones, R. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 186-190.*

Includes references.

Descriptors: mice; rats; dna-fingerprinting; inbred-strains; strain-differences; strains; dna-probes; storage-quality; sample-storage; genetic- contamination

80 NAL Call No.: QL55.F43-1993

Do rats prefer solid or gridded floors.

Manser, C. E.; Morris, T. H.; Broom, D. M. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 462-463.*

Poster presentation at the symposium.

Descriptors: rats; floor-type; cages

81 NAL Call No.: QL55.F43-1993

Does autoclaving of the chow have an immunomodulating effect in NOD mice.

Herberg, L.; Partke, H. J.; Leiter, E. H. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 419-421.*

Poster presentation at the symposium.

Descriptors: mice; diabetes; familial-incidence; feeds; autoclaving; spf-husbandry; sex-differences

82 NAL Call No.: RC628.O294**Does thermoregulatory feeding occur in newborn infants? A novel view of the role of brown adipose tissue thermogenesis in control of food intake.**

Himms Hagen, J. *Obes-res* v.3(4): p.361-369. (1995 July)

Includes references.

Descriptors: food-intake; heat-production; body-temperature; body-temperature-regulation; adipose-tissue; neonates; rats

Abstract: The physiological significance of the extensive deposits of brown adipose tissue (BAT) in newborn human infants has been the subject of much experimentation and discussion. Because of its large thermogenic capacity, its function has usually been viewed as preparing the infant for producing heat in response to cold exposure at birth. Newborn infants are indeed capable of precise thermoregulation for a limited time over a rather limited range of ambient temperatures, from thermoneutrality (32-34 degrees C) down to common "room" temperatures (24-28 degrees C). During such mild "cold-exposure", in response to a decrease in their skin temperature, their sympathetic nervous system activity increases, and they can more than double their resting metabolic rate, principally by thermogenesis in their BAT. This review puts forward an entirely new role for BAT thermogenesis in the cyclic feeding pattern of newborn infants during their first months of life. BAT thermogenesis is proposed to be an integral element in a physiological thermoregulatory feeding control mechanism in which extended periods of very gradual cooling are interspersed with episodes of increased sympathetic nervous system activity, increased heating via BAT thermogenesis, arousal, and feeding. The cry with which the baby attracts its mother's attention is an integral part of the mechanism, as is the nutritive suckling reflex and the behavior of the mother. Initiation of feeding is attributed to a transient dip in blood glucose concentration that is due to stimulation of glucose utilization in the BAT. Termination of feeding is attributed to the high temperature brought about by the stimulated BAT thermogenesis. The duration of the urge to feed, temperature in newborn infants, and meals occur at fairly frequent intervals both day and night in infants that are fed on demand. These physiological mechanisms are consistent with the limited information on phenomena attending spontaneous feeding in the newborn human infant and with what is known about the physiological control of feeding in rats. In rats, thermoregulatory feeding is defined as a feeding episode that occurs during a transient but marked increase in sympathetic nervous system activity that has several consequences. It stimulates BAT thermogenesis and increases body temperature. It produces a transient decline in blood glucose concentration secondary to the increased uptake of glucose by the stimulated BAT; this signals the initiation of the feeding episode. Subsequently the high temperature induced by BAT thermogenesis signals termination of the feeding episode. The size of the meal is determined by the balance between the capacity for BAT thermogenesis (heat production) and ambient temperature (heat loss). BAT thermogenesis is here viewed as an integral part of a physiological feeding control mechanism that links thermal balance with energy balance. The phenomenon is referred to as thermoregulatory feeding to distinguish it from feeding originating from other causes. As applied to human infants, the thermoregulatory feeding hypothesis supports the current practice of "feeding-on-demand", i.e., entirely in accordance with the physiological oscillations in body temperature generated by the baby, determined by its thermal. implications for feeding premature infants housed in incubators, usually fed on schedule rather than on demand, requires investigation.

83 NAL Call No.: 410.9-P94**Duration of protection from reinfection following exposure to sialodacryoadenitis virus in wistar rats.**

Percy, D. H.; Bond, S. J.; Paturzo, F. X.; Bhatt, P. N. *Lab-Anim-Sci* v.40(2): p.144-149. ill. (1990 Mar.)

Includes references.

Descriptors: rats; sialodacryoadenitis-virus; viral-diseases; disease-resistance; immunity; reinfection; disease-transmission

Abstract: Wistar rats [CR1:(WI)BR] were inoculated intranasally with approximately 10(3) median mouse lethal infective doses of sialodacryoadenitis (SDA) virus. Animals were subsequently selected at random, removed to a separate isolation room, and reinfected with SDA virus at 3, 6, 9, 12 or 15 months. Pre- and postinoculation serum samples were collected from all animals during the course of the study and evaluated for antibody titers to SDA virus. All experimental, control and sentinel animals, following inoculation with SDA virus, were necropsied and examined for lesions consistent with SDA. Salivary gland lesions were minimal to absent in rats reinfected with SDA virus for up to 12 to 15 months after the initial exposure and minimal to moderate in the respiratory tract at 12 or 15 months. SDA-associated lesions were extensive in age matched control animals examined at each time period of reinfection with SDA virus. Thus, prior exposure to SDA virus did protect against the development of typical salivary gland lesions for up to 15 months. Recovered animals were evaluated for their ability to transmit the virus following reinfection. Rats reinfected at 6 or 9 months were infectious to their naive cage mates. The results indicate that reinfection with homologous rat coronavirus can occur as early as 6 months after the initial

infection, and such rats can transmit the infection to contact controls.

84 NAL Call No.: QP141.A1A64

Effect of activation of the serotonergic system during prolonged starvation on subsequent caloric intake and macronutrient selection in the Zucker rat.

Duhault, J.; Lacour, F.; Espinal, J.; Rolland, Y. *Appetite* v.20(2): p.135-144. (1993 Apr.)

Includes references.

Descriptors: energy-intake; starvation; serotonin; appetite; food-preferences; macronutrients; rats

Abstract: Starvation or dietary restriction are known to modify post-fasting dietary self-selection. We have examined the effects of activation of the serotonergic system and food deprivation on macronutrient self-selection following a period of starvation. Rats were starved for 4 days and either treated or not with dl-fenfluramine or fluoxetine. Starved untreated animals showed a post-fasting anorexia and an increased preference for carbohydrate intake, even though lipids remained the preferred source of calories. Treatment with fenfluramine or fluoxetine increased post-fasting anorexia, abolished the preference for carbohydrates and decreased lipid intake. Fluoxetine, but not fenfluramine, resulted in decreased protein intake as well. Following a 2-day refeeding period ad libitum, during which the animals were not treated with drugs, the anorectic effect of fenfluramine disappeared but that of fluoxetine remained unchanged. In addition, we noted that at an equimolar dose to dl-fenfluramine (100 micromolar/kg/day) fluoxetine treatment resulted in the death of all the animals in the group by the second day of refeeding; no deaths were observed in any of the other groups. In conclusion, we confirm a post-starvation anorexia and increased carbohydrate intake following long-term fasting. In addition we show that activation of the serotonergic system abolishes the increase in carbohydrate intake and potentiates post-starving anorexia.

85 NAL Call No.: 391.8-F73

Effect of acute administration of fish oil (omega-3 marine triglyceride) on gastric ulceration and secretion induced by various ulcerogenic and necrotizing agents in rats.

Al Harbi, M. M.; Islam, M. W.; Al Shabanah, O. A.; Al Gharably, N. M. *Food-chem-toxicol* v.33(7): p.553-558. (1995 July)

Includes references.

Descriptors: fish-oils; gastric-juices; gastric-ulcer; inhibition

Abstract: The fish oil commercially known as Marine-25 (omega-3 marine triglyceride) is an eicosapentaenoic acid (EPA)-rich oil. It was investigated for its ability to inhibit gastric secretion and to protect the gastric mucosa against the injuries caused by pyloric ligation, non-steroidal anti-inflammatory drugs (NSAIDs--aspirin and indomethacin), reserpine, hypothermic restraint stress and necrotizing agents [0.6 M HCl 0.2 M NaOH or 80% (v/v) aqueous ethanol]. The results showed that the fish oil, at a dose of 5 or 10 ml/kg body weight, provided significant protection in the various experimental models used. It produced a significant inhibition of gastric mucosal damage induced by pyloric ligation, NSAIDs, reserpine or hypothermic restraint ulcers. Fish oil also exerted a significant inhibitory action on gastric mucosal lesions produced by venous necrotizing agents. Our findings show that fish oil rich in eicosapentaenoic acid possesses both antisecretory and antiulcerogenic effects.

86 NAL Call No.: 410.9-P94

Effect of bleeding site on clinical laboratory testing of rats: orbital venous plexus versus posterior vena cava.

Dameron, G. W.; Weingand, K. W.; Duderstadt, J. M.; Odioso, L. W.; Dierkman, T. A.; Schewecke, W.; Baran, K.

Lab-Anim-Sci v.42(3): p.299-301. (1992 June)

Includes references.

Descriptors: rats; blood-sampling; vena-cava; veins; laboratory-tests; blood-chemistry; hematology; blood-coagulation

Abstract: We sought to determine if there were any differences in the results of clinical laboratory tests between blood samples collected from the orbital venous plexus and the posterior vena cava of adult male rats. Thirty healthy adult male Sprague Dawley rats were anesthetized by ether inhalation, and blood samples were collected successively from the orbital venous plexus (OVP) and the posterior vena cava (PVC) for hematologic (n = 10), serum chemistry (n = 10), and coagulation (n = 10) analyses. The prothrombin and partial thromboplastin times of samples from the OVP were prolonged (17% and 288%, respectively) when compared with samples from the PVC. Respective hematologic biases were as follows: red blood cell count (7%), hemoglobin (6%), hematocrit (5%), mean corpuscular volume (-3%), mean corpuscular hemoglobin (-1%), mean corpuscular hemoglobin content (1%), white blood cell count (13%), and platelet count (-7%). Respective serum chemistry biases were as follows: sorbitol dehydrogenase (-7%), glucose (-7%), blood urea nitrogen

(-10%), creatinine (-2%), total protein (4%), albumin (2%), globulin (9%), alkaline phosphatase (5%), lactate dehydrogenase (-6%), aspartate aminotransferase (-5%), alanine aminotransferase (-2%), total bilirubin (0%), direct bilirubin (0%), magnesium (-17%), sodium (4%), potassium (0), chloride (4%), calcium (-2%), phosphorous (-17%), cholesterol (3%), triglycerides (24%), creatinine kinase (-8%), 5'nucleotidase (0%), and total bile acids (4%). For hematologic testing, there were no biologically significant differences between samples collected from the OVP and PVC. The coagulation times and serum Mg and P showed biologically significant differences between samples collected from the OVP and PVC. We recommend that coagulation times not be measured on plasma samples collected from the OVP.

87 NAL Call No.: 389.8-J82

Effect of chronic selenite supplementation on selenium excretion and organ accumulation in rats.

Janghorbani, M.; Rockway, S.; Mooers, C. S.; Roberts, E. M.; Ting, B. T. G.; Sitrin, M. D. *J-Nutr* v.120(3): p.274-279. (1990 Mar.)

Includes references.

Descriptors: diet; supplements; selenium; excretion; tissues; composition; rats

Abstract: We examined the effect of chronic selenite supplementation on whole body and selected organ selenium (Se) accumulation, urine excretion of total Se and trimethylselenonium ion, and Se balance in adult male rats. Animals were housed in metabolic cages and given either deionized water or water containing 4 microgram of Se/mL as selenite for 30 d. Absorption of selenite was nearly complete, with only approximately 10% of ingested Se appearing in feces. There was a rapid rise in urinary Se that reached a plateau within a few days and accounted for 54 +/- 2% of the intake. Excretion of trimethylselenonium ion (TMS_e) in urine increased rapidly, representing 35-40% of urinary Se in the supplemented animals compared with only 2% for the control group. In one experiment, rats were killed at 30 d and total carcass Se was measured using isotope dilution analysis. Supplemented rats had only a modest increase in whole body Se (94 +/- 4 microgram Se vs. 66 +/- 3 in controls). Calculation of Se balance in the supplemented rats showed that approximately 35% of ingested Se could not be accounted for by urine plus fecal losses combined with the portion retained in the carcass. The results from this study demonstrate that under the condition of supplementation at 4 microgram of Se/mL of drinking water, pathways other than urinary and fecal excretion may account for a substantial portion of Se loss.

88 NAL Call No.: 49-J82

Effect of Clenbuterol on growth and body composition during food restriction in rats.

Cardoso, L. A.; Stock, M. J. *J-anim-sci* v.74(9): p.2245-2252. (1996 Sept.)

Includes references.

Descriptors: rats; clenbuterol; restricted-feeding; feed-intake; beta-adrenergic-agonists; liveweight-gain; body-weight; feed-conversion; dressing- percentage; protein-content; water-content; body-composition; organs; weight; muscles; digestive-tract; growth-rate; fat-content

Abstract: Clenbuterol was administered as a dietary admixture (4 mg/kg diet) to three groups of male Wistar rats (n = 8) housed individually in metabolism cages and fed for 15 d at 110, 160, and 235% (ad libitum) of estimated requirement for energy maintenance. Untreated groups at each level of energy intake were also included. There was no effect of clenbuterol on food intake in the ad libitum group, but the drug produced significant increases in body weight, feed efficiency, and carcass weight, dressing and protein content at all three levels of energy intake. This effect of clenbuterol was particularly noticeable in the restricted animals. Clenbuterol caused changes in body composition (increased percentage of water and protein, decreased percentage of fat) in the ad libitum rats but had no effect in the restricted groups. The reduction in the growth of the viscera caused by energy restriction was not affected by clenbuterol, apart from in the 110% restricted group, where the gastrointestinal tract was 26% heavier in the clenbuterol-treated rats. The result, show that the growth anabolic actions of clenbuterol can be sustained and may be even more marked in rats fed restrictively than in those given ad libitum access to feed.

89 NAL Call No.: 59.8-C33

Effect of dietary cereal brans on body weight and blood lipids in a long-term rat experiment.

Mongeau, R.; Brassard, R.; Malcolm, S.; Shah, B. G. *Cereal-Chem* v.68(5): p.448-453. (1991 Sept.-1991 Oct.)

Includes references.

Descriptors: oat-bran; hard-wheat; wheat-bran; maize-bran; experimental-diets; fiber-content; growth-rate; blood-lipids; cholesterol; liveweight-gain; body-weight; sex-differences; high-density-lipoprotein; organs; weight; human-nutrition-research; rats; long-term-experiments; dietary-fiber

90 NAL Call No.: QP141.A1N88**Effect of dietary cereal brans on the metabolism of calcium, phosphorous and magnesium in a long term rat study.**

Shah, B. G.; Malcolm, S.; Belonje, B.; Trick, K. D.; Brassard, R.; Mongeau, R. *Nutr-Res* v.10(9): p.1015-1028. (1990 Sept.) Includes references.

Descriptors: diet; cellulose; maize-bran; oat-bran; wheat-bran; mineral-metabolism; calcium; phosphorus; magnesium; rats

Abstract: The effect of cereal brans on the mineral metabolism of rats was studied in a seven month long experiment. Seven groups (10 each) of male and female Sprague-Dawley weanling rats were fed ad lib for 7 weeks, diets containing cellulose, oat bran, hard red spring wheat bran, soft white wheat bran, corn bran and rodent lab chow at 4% or 14% total dietary fibre. In the seventh week (Phase 1) a mineral balance study was conducted on five randomly selected rats from each group. During week 8 these animals were killed and liver, heart, muscle and femur collected from each animal. The remaining animals were continued on the same diets for 21 more weeks. A second mineral balance study was carried out during week 24 (Phase 2) and the animals were killed during week 29 after colonic function tests during weeks 25-28. The diet, urine, feces and tissues were analysed for calcium, phosphorus, magnesium, phytate (in diet and feces only) and trace elements. Results on macro-mineral elements indicated that the fractional absorption of calcium, phosphorus and magnesium by male and female rats was not significantly different (P less than or equal to 0.01). Absorption was affected by the level of the total mineral in the diet and not by the kind of fibre source. Variation in the digestibility of phytate was probably caused by the phytase activity in the bran rather than its phytate content. Digestibility during week 24 was less than during week 7 in most cases. The diets did not appreciably affect mineral levels in soft tissues and bone except the females in all purified diet groups showed severe nephrocalcinosis in both phases. Kidneys of males fed some diets showed mild calcification in phase 2. The absence of nephrocalcinosis in females fed the rat chow was associated with low levels of urinary phosphorus and also to the fluoride and high magnesium content of the chow.

91 NAL Call No.: QL55.F43-1993**Effect of dietary phosphorus level on mineral excretion: a comparison between ovariectomized cats and rats.**

Pastoor, F. J. H.; Klooster, A. Th. v.; Tintelen, G. v.; Opitz, R.; Mathot, J. N. J. J.; Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 223-227.*

Includes references.

Descriptors: cats; rats; ovariectomized-females; dietary-minerals; phosphorus; excretion; calcium; magnesium; urine; ph; species-differences; mineral-absorption

92 NAL Call No.: 381-AR2**Effect of dietary restriction on the degradation of proteins in senescent mouse liver parenchymal cells in culture.**

Ishigami, A.; Goto, S. *Arch-Biochem-Biophys* v.283(2): p.362-366. (1990 Dec.)

Includes references.

Descriptors: fasting; food-deprivation; protein-degradation; liver-cells; aging; rats

Abstract: We previously reported that the half-life of protein degradation in cells from old mice is about 50% longer than that in cells from young or middle-aged ones. In the present study we investigated the degradation rate of microinjected proteins (horseradish peroxidase (HRP) and ovalbumin (OVA)) and pulse-labeled proteins in hepatocytes from dietary-restricted old mice. Dietary restriction was initiated when mice were 23 months of age and performed in two steps (first 80% and then 60% of the ad libitum intake), the total period being 70 days. Hepatocytes were isolated from mice fed a restricted diet and fed ad libitum. The half-lives of HRP, OVA, and pulse-labelled proteins in the hepatocytes from mice fed a restricted diet were about 40% shorter than those in the cells from mice fed ad libitum. These values were close to those in the cells of young animals. These results are discussed in relation to our previous findings that a similar regimen reduces the percentage of heat-labile enzymes accumulated in tissues of aged animals.

93 NAL Call No.: 448.8-J8293**Effect of food deprivation and altered thyroid status on the hypothalamic-pituitary-thyroid axis in the rat.**

Blake, N. G.; Johnson, M. R.; Eckland, D. J. A.; Foster, O. J. F.; Lightman, S. L. *J-Endocrinol* v.133(2): p.183-188. (1992 May)

Includes references.

Descriptors: food-deprivation; triiodothyronine; feedback; thyrotropin; thyrotropin-releasing-hormone; messenger-rna;

propylthiouracil; hyperthyroidism; hypothalamus; thyroid-gland; anterior-pituitary; interactions; rats; males

Abstract: Propylthiouracil (PTU) was administered to rats for different lengths of time with or without food deprivation on the last 2 days. Within 4 days of PTU treatment peripheral 3,5,3'-tri-iodothyronine (T3) fell to low levels and beta-subunit of thyroid-stimulating hormone (beta-TSH) mRNA increased significantly in the anterior pituitary. Pro-thyrotrophin-releasing hormone (pro-TRH) mRNA in the hypothalamic paraventricular nucleus (PVN) increased significantly in the control group of animals by 8 days and in the food-deprived group by day 12; the increment of pro-TRH mRNA in the food-deprived group on day 12 was significantly less than that in the control group. In a second study, animals were treated with intraperitoneal injections of T3 with or without the food deprivation. After 4 days of T3 treatment, peripheral T3 levels were markedly increased and pro-TRH mRNA in the PVN and beta-TSH mRNA in the anterior pituitary were significantly reduced. Food deprivation had no additional suppressive effect. These studies confirm that the predominant effect of food deprivation on the thyroid axis is at the hypothalamic or suprahypothalamic level and that it can, at least in part, overcome the increase in TRH mRNA due to diminished T3 feedback.

94 NAL Call No.: QP801.H7H65

Effect of food deprivation on the pulsatile LH release in the cycling and ovariectomized female rat.

Cagampang, F. R. A.; Maeda, K. I.; Yokoyama, A.; Ota, K. *Horm-Metab-Res-Horm-Stoffwechselforschung-Horm-Metab* v.22(5): p.269-272. (1990 May)

Includes references.

Descriptors: food-restriction; rats; female-animals; lhrh; ovariectomy; body-weight; blood-glucose

95 NAL Call No.: 447.8-AM3

Effect of food restriction on hyperoxia-induced lung injury in preterm guinea pig.

Langley, S. C.; Kelly, F. J. *Am-J-Physiol* v.263(3,pt.1): p.L357-L362. (1992 Sept.)

Includes references.

Descriptors: undernutrition; food-restriction; hyperoxia; oxygen; glutathione; antioxidants; enzyme-activity; prematurity; mortality; lungs; damage; guinea-pigs; newborn-animals

Abstract: Effect of food restriction on hyperoxia-induced lung injury in preterm guinea pig. *Am. J. Physiol.* 263 (Lung Cell. Mol. Physiol. 7): L357- L362, 1992. Undernutrition may exacerbate hyperoxia-induced lung injury, a finding that may be of significance in the early clinical management of the premature human infant. Addressing this specific problem, we found that 72 h of food restriction in guinea pig pups delivered 3 days preterm increased mortality rates among pups exposed to 95% oxygen (8/18) and yet had no effect on 21% oxygen (air)- exposed pups (0/10). Reduced tolerance of hyperoxic conditions was not, however, associated with increased lung injury, assessed as pulmonary microvascular leakage. Pulmonary antioxidant enzyme activities [Cu,Zn superoxide dismutase (SOD), Mn SOD, glutathione peroxidase, and catalase] were unaltered by starvation or hyperoxia. Lung glutathione concentration was slightly decreased after food restriction, whereas hyperoxic exposure did not change either lung or bronchoalveolar lavage fluid glutathione concentrations or lung antioxidant enzyme activities. Increased susceptibility to the lethal effects of oxygen in the starved preterm guinea pig pup could not be attributed to a deficiency of pulmonary antioxidant defenses.

96 NAL Call No.: TX341.H85

Effect of genetic and dietary obesity on sodium, potassium, calcium and magnesium handling by the rat.

Fernandez Lopez, J. A.; Rafecas, I.; Esteve, M.; Remesar, X.; Alemany, M. *Int-j-food-sci-nutr* v.45(3): p.191-201. (1994 Sept.)

Includes references.

Descriptors: obesity; diet; genetics; mineral-metabolism; sodium; potassium; calcium; magnesium; rats

97 NAL Call No.: QP141.A1N88

Effect of genetic and dietary obesity on sulphur management by the rat.

Fernandez Lopez, J. A.; Rafecas, I.; Esteve, M.; Remesar, X.; Alemany, M. *Nutr-res* v.13(7): p.825-830. (1993 July)

Includes references.

Descriptors: obesity; sulfur; diet; genetic-factors; mineral-metabolism; experimental-diets; mineral-absorption; excretion; urine; feces; rats

Abstract: The sulphur and nitrogen accrual in one month of 30-day old rats, as well as their intake and excretion were studied in three groups of

98 NAL Call No.: 41.8-AM3A

Effect of in-house transport on murine plasma corticosterone concentration and blood lymphocyte populations.

Drozdowicz, C. K.; Bowman, T. A.; Webb, M. L.; Lang, C. M. *Am-J-Vet-Res* v.51(11): p.1841-1846. (1990 Nov.)

Includes references.

Descriptors: mice; transport-of-animals; stress; lymphocytes; corticosterone; blood-plasma; leukocyte-count; thymus-gland; immunosuppression

Abstract: The effect of in-house transport on plasma corticosterone concentration and blood lymphocyte populations of laboratory mice was investigated. Mice were transported within a research facility at 0900 hours in a pattern designed to simulate that commonly used by investigators prior to experimental manipulation. Plasma corticosterone concentration and WBC count were determined at 0.25, 2, 4, 8, 12, and 24 hours after transport. A significant (P less than 0.05) increase in plasma corticosterone concentration was seen in mice immediately after transport. The normal circadian rhythm of plasma corticosterone concentration was altered for the subsequent 24-hour period. Corresponding significant (P less than 0.05) decreases in total WBC numbers, lymphocyte count, and thymus gland weight were observed. The decrease in total blood lymphocyte numbers at 4 hours was reflected in B- and T-lymphocyte populations. The subsequent acute increase in plasma corticosterone concentration was associated with alterations in the cellular components of the immune system. Results of the study indicated that routine in-house transport of laboratory mice should be considered a stressful stimulus.

99 NAL Call No.: SF405.5.A23

Effect of intracage ventilation and automatic watering on outbred mouse reproductive performance and weaning growth.

Huerkamp, M. J.; Dillehay, D. L.; Lehner, N. D. M. *Contem-top-lab-anim-sci* v.33(5): p.58-62. (1994 Sept.)

Includes references.

Descriptors: mice; cages; artificial-ventilation; drinkers; automatic-feed-dispensers; reproductive-performance; pups; growth; survival

100 NAL Call No.: 442.8-L62

Effect of photoperiod on body weight and food intake of obese and lean Zucker rats.

Larkin, L. M.; Moore, B. J.; Stern, J. S.; Horwitz, B. A. *Life-Sci* v.49(10): p.735-745. (1991)

Includes references.

Descriptors: obesity; leanness; photoperiod; body-weight; food-intake; brown-fat; depot-fat; carcass-composition; insulin; glucose; corticosterone; blood-chemistry; rats

Abstract: Although the rat is usually not considered to be sensitive to photoperiod, under some experimental conditions photoperiod responses are unmasked. In addition, we have observed photoperiod-induced changes in body weight gain in lean and obese Zucker rats. In this experiment, body mass, food intake, body composition, brown adipose tissue (BAT) thermogenic state, and blood concentrations of corticosterone, insulin, and glucose were evaluated under one of two lighting conditions: a short (10 h light: 14 h dark) or a long (14 h light: 10 h dark) photoperiod. Plasma corticosterone and glucose concentrations measured under fasting conditions were unaffected by photoperiod in either genotype. The amount of BAT mitochondrial protein isolated was less in long photoperiod rats. BAT mitochondrial GDP binding was unaffected by photoperiod in the lean rats, but tended to be lower in long photoperiod obese rats than in short photoperiod obese rats. Although, photoperiod had no effect on daily food intake of rats exposed to the short versus long photoperiod, body mass was heaviest in obese rats raised in long photoperiod. Plasma insulin was increased in both lean and obese rats in long photoperiod. In addition, fat storage appeared to shift to internal depots in the lean rats exposed to long photoperiod. Our data demonstrate that photoperiod does have an effect on male Zucker rats with respect to body weight and fat distribution, with the obese rats being more sensitive to changes in photoperiod than the lean rats.

101 NAL Call No.: SF405.5.A23

Effect of population size on humidity and ammonia levels in individually ventilated microisolation rodent caging.

Chol, G. C.; McQuinn, J. S.; Jennings, B. L.; Hassett, D. J.; Michaels, S. E. *Contem-top-lab-anim-sci* v.33(6): p.77-81. (1994 Nov.)

Includes references.

Descriptors: mice; cages; population-density; relative-humidity; ammonia; microenvironments; ventilation; ventilated-microisolation-cages; static-microisolation-cages

102 NAL Call No.: QL55.F43-1993

The effect of prophylactic FCA treatment on diabetes incidence in a NOD mouse colony.

Dagnaes Hansen, F.; Hansen, P. S.; Buschard, K. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 417-418.*

Poster presentation at the symposium.

Descriptors: mice; congenital-metabolic-anomalies; diabetes; chemoprophylaxis; adjuvants; survival; familial-incidence; delayed-onset; freund's-complete-adjuvant

103 NAL Call No.: RS160.J6

Effect of Salvia haematodes on sexual behaviour of male rats.

Islam, M. W.; Tariq, M.; Ageel, A. M.; Al Said, M. S.; Al Yhya, A. M. *J-Ethno-Pharmacol* v.33(1/2): p.67-72. (1991 May-1991 June)

Includes references.

Descriptors: rats; salvia-pratensis; plant-extracts; roots; sex; stimulants; sexual-behavior; traditional-medicines; males; saudi-arabia; aphrodisiacs

Abstract: The effect of an ethanolic extract of Salvia haematodes roots was studied on the sexual behaviour of male rats. In the initial experiments, male sexual responses were assessed by recording penile erection, licking and grooming of genitals and copulatory movement in absence of females. In the second set, copulatory behaviour was observed by caging males with a receptive female brought into estrus with s.c. injection of estradiol benzoate and progesterone. The frequencies of mounting and intromission and latency of the ejaculation were recorded. The results show that the extract (500 mg/kg, orally) produced a significant increase in episodes of penile erection. The drug was found to enhance the orientation of males towards the female by increased anogenital investigatory behaviour and enhanced licking and grooming of the genitals. The extract also increased the ejaculation latency. These findings support the folk use of this plant as aphrodisiac and for the treatment of premature ejaculation.

104 NAL Call No.: QP141.A1J54

Effect of selenium deficiency on tissue taurine concentration and urinary taurine excretion in the rat.

Piao, J. H.; Hill, K. E.; Hunt, R. W. Jr.; Burk, R. F. *J-Nutr-Biochem. [Stoneham, Mass.] : Butterworths Aug 1990. v. 1 (8) p. 427-432.*

Includes references.

Descriptors: diet; mineral-deficiencies; selenium; tissues; taurine; urine; excretion; kidneys; glutathione; cysteine; rats

Abstract: The purpose of this study was to determine the effect of selenium deficiency on tissue taurine levels and urinary taurine excretion. Weanling male Sprague-Dawley rats were fed selenium-deficient or selenium-adequate diets for 20 weeks. As selenium deficiency developed, urinary taurine excretion increased in selenium-deficient rats compared to controls. At 12 weeks, the selenium-deficient rats excreted 1.7-fold more taurine than control rats. At the same time plasma glutathione peroxidase was 1.2% of control and plasma glutathione was 226% of control. At 20 weeks, renal taurine was decreased but renal glutathione was increased in selenium-deficient rats compared to controls. Feeding the experimental diet for 6 weeks without methionine supplementation caused a fall in urinary taurine excretion. However, there was no difference between selenium-deficient and control rats. These results indicate that selenium deficiency affects renal handling of taurine in the rat when dietary sulfur amino acids are not restricted.

105 NAL Call No.: QL55.F43-1993

The effect of social environment on the production of specific immunoglobulins against an immunogen (human IgG) in mice.

Abraham, L.; O'Brien, D.; Svendsen, L.; Stodulski, G.; Hau, J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 165-170.*

Includes references.

Descriptors: mice; antibody-formation; stress-response; isolation; animal-welfare; stress-factors; fighting; body-weight; blood-serum; corticosterone

106 NAL Call No.: 410.9-P94

The effectiveness of a microisolator cage system and sentinel mice for controlling and detecting MHV and Sendai virus infections.

Dillehay, D. L.; Lehner, N. D. M.; Huerkamp, M. J. *Lab-Anim-Sci* v.40(4): p.367-370. (1990 July)

Includes references.

Descriptors: mice; murine-paramyxovirus; viral-hepatitis; cages; isolation; sentinel-animals; litter; disease-prevention; detection; mouse-hepatitis-virus; soiled-litter

Abstract: Experiments were conducted to determine (a) whether BALB/c mice housed on soiled bedding can be used as sentinels for the detection of Sendai virus and MHV from infected mice housed in microisolators, and (b) whether the microisolator caging system protects mice against Sendai virus and MHV infections. Sentinel mice were housed in microisolator cages, exposed continuously to soiled bedding and bled at 21 and 42 days for serology. All sentinel mice were seropositive for MHV by 42 days; however, sentinel mice exposed to soiled bedding were seronegative for Sendai virus at 21 and 42 days. These results suggest that sentinels housed on soiled bedding may not detect all infectious murine viruses. This study also showed that the microisolator caging system provided an effective barrier against MHV infection at the cage level and suggests that the microisolators should protect mice against other infectious agents.

107 NAL Call No.: 410.9-P94

The effects of a mass air displacement unit on the microenvironmental parameters within isolator cages.

Corning, B. F.; Lipman, N. S. *Lab-Anim-Sci* v.42(1): p.91-93. (1992 Feb.)

Includes references.

Descriptors: mice; cages; air-quality; air-flow; microenvironments; gases

108 NAL Call No.: 41.8-R312

Effects of acute and chronic restraint on the adrenal gland weight and serum corticosterone concentration of mice and their faecal output of oocysts after infection with *Eimeria apionodes*.

Tuli, J. S.; Smith, J. A.; Morton, D. B. *Res-vet-sci* v.59(1): p.82-83. (1995 July)

Includes references.

Descriptors: mice; restraint-of-animals; stress; adrenal-glands; weight; corticosterone; blood-serum; feces; oocysts; eimeria; susceptibility; immunity

Abstract: Experiments were designed to investigate the potential stress of procedures commonly used for restraining mice and to discover whether habituation of the adrenocortical response occurred when chronic restraint was used. The study also examined the effect of chronic restraint on the faecal output of oocysts by mice trickle infected with *Eimeria apionodes*. The results showed that restraining mice for one hour was stressful and that restraining them repeatedly for one hour daily for seven or 21 days did not lead to habituation of the adrenocortical response. Restraint for one hour daily for seven days did not cause the recurrence of a clinical infection in mice which were chronically infected with *E. apionodes*. Restraining mice for one hour daily for seven days before and for 14 days during the infection also had no effect on the prepatency, patency or intensity of an *E. apionodes* infection.

109 NAL Call No.: QL55.A1L33

Effects of ambient lighting on the eyes of rats.

Kupp, R. P. Jr.; Pinto, C. A.; Rubin, L. F.; Griffin, H. E. *Lab-Anim* v.18(5): p.32-35, 37. ill. (1989 July-1989 Aug.)

Includes references.

Descriptors: rats; eyes-animal; natural-light; facilities; lighting; retinas; degeneration

110 NAL Call No.: 447.8-Am3

Effects of blockade of fatty acid oxidation on whole body and tissue-specific glucose metabolism in rats.

Jenkins, A. B.; Storlein, L. H.; Cooney, G. J.; Denyer, G. S.; Caterson, I. D.; Kraegen, E. W. *Am-j-physiol* v.265(4,pt.1): p.E592-E600. (1993 Oct.)

Includes references.

Descriptors: hyperinsulinemia; food-deprivation; carbohydrate-metabolism; glucose; fatty-acids; oxidation; lipid-

metabolism; pyruvate- dehydrogenase-lipoamide; carnitine-palmitoyltransferase; enzyme-inhibitors; skeletal-muscle; liver; heart; adipose-tissue; methyl-palmoxirate

Abstract: We examined the effect of the long-chain fatty acid oxidation blocker methyl palmoxirate (methyl 2-tetradecyloxirancarboxylate, McN- 3716) on glucose metabolism in conscious rats. Fasted animals [5 h with or without hyperinsulinemia (100 mU/1) and 24 h] received methyl palmoxirate (30 or 100 mg/kg body wt po) or vehicle 30 min before a euglycemic glucose clamp. Whole body and tissue-specific glucose metabolism were calculated from 2-deoxy-[3h]-glucose kinetics and accumulation. Oxidative metabolism was assessed by respiratory gas exchange in 24-h fasted animals. Pyruvate dehydrogenase complex activation was determined in selected tissues. Methyl palmoxirate suppressed whole body lipid oxidation by 40-50% in 24-h fasted animals, whereas carbohydrate oxidation was stimulated 8- to 10-fold. Whole body glucose utilization was not significantly affected by methyl palmoxirate under any conditions; hepatic glucose output was suppressed only in the predominantly gluconeogenic 24-h fasted animals. Methyl palmoxirate stimulated glucose uptake in heart in 24-h fasted animals [15 +/- 5 vs. 220 +/- 28 (SE) micromolar.100 g-1.min-1], with smaller effects in 5-h fasted animals with or without hyperinsulinemia. Methyl palmoxirate induced significant activation of pyruvate dehydrogenase in heart in the basal state, but not during hyperinsulinemia. In skeletal muscles, methyl palmoxirate suppressed glucose utilization in the basal state but had no effect during hyperinsulinemia. skeletal muscle are consistent with the operation of a mechanism similar to the Pasteur effect. The lack of effect of methyl palmoxirate on whole body glucose utilization was consistent with a sum of opposing effects in tissues behaving like heart and like skeletal muscles.

111 NAL Call No.: 410-B77

The effects of cage cleaning on aggression within groups of male laboratory mice.

Gray, S.; Hurst, J. L. *Anim-behav* v.49(pt.3): p.821-826. (1995 Mar.)

Includes references.

Descriptors: mice; aggressive-behavior; cages; cleaning; odors; male-animals

Abstract: Cage cleaning is an unavoidable but frequent source of disturbance for mice maintained in the laboratory. A series of tests was conducted to assess how physical disturbance, the removal of odour cues and exposure to the odours of strangers experienced during cage cleaning affects aggression within established groups of male CFLP mice, *Mus musculus*. Handling mice decreased the latency to attack and increased the frequency and duration of aggression within groups. Transferring mice into completely clean cages reduced aggression compared to those replaced in home cages that had not been cleaned. Exposure to the odours of strangers while males were held temporarily in a handling bin had no significant effect on aggression when the males were transferred to clean cages or returned to their home cages. Aggression was greatest when mice were replaced in home cages that had not been cleaned but that had a clean sawdust substrate, and decreased with increasing removal of home cage odours on the cage base and grill. Common cage-cleaning practices in which only the substrate and parts of the cage are cleaned, and other procedures that involve daytime handling and replacing mice in their home cage may thus promote aggression within male groups. Transferring mice into completely clean cages is recommended when aggression within caged groups of males is a concern.

112 NAL Call No.: QL55.F43-1993

Effects of cage height and environmental enrichment on rats' behaviour.

Hirsjarvi, P. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 343-344.*

Poster presentation at the symposium.

Descriptors: rats; cages; floor-area; height; animal-behavior; toys

113 NAL Call No.: 410.9-P94

Effects of carbon dioxide-induced anesthesia on cholinergic parameters in rat brain.

Berger Sweeney, J.; Berger, U. V.; Sharma, M.; Paul, C. A. *Lab-anim-sci* v.44(4): p.369-371. (1994 Aug.)

Includes references.

Descriptors: rats; acetylcholinesterase; choline-acetyltransferase; enzyme-activity; anesthesia; carbon-dioxide; decapitation; hippocampus; cerebral- cortex; cerebellum; euthanasia; animal-welfare

Abstract: We report that acetylcholinesterase (AChE) and choline acetyltransferase (ChAT) activities in rat brain were virtually identical whether the rat was anesthetized with carbon dioxide (CO₂) before decapitation or decapitated without

prior sedation. The AChE and ChAT activities were measured in three brain regions; the hippocampus, cerebral cortex, and cerebellum. Enzyme activities varied significantly by brain region, with the highest values in the hippocampus and the lowest values in the cerebellum. Enzyme activities, however, did not vary with the method of euthanasia, either CO₂-induced anesthesia prior to decapitation or decapitation without anesthesia. These data suggest that CO₂-induced anesthesia prior to decapitation does not alter activities of these cholinergic markers in rat hippocampus, cerebral cortex, and cerebellum. This method of euthanasia eliminates the need to capture a conscious animal, which reduces stress to the animal and the experimenter.

114 NAL Call No.: QP1.C6

Effects of diabetes and food deprivation on shivering activity during progressive hypothermia in the rat.

Kilgour, R. D.; Williams, P. A. *Comp-biochem-physiol-Part-A,-Physiol* v.114A(2): p.159-162. (1996 June)

Includes references.

Descriptors: experimental-diabetes; food-consumption; hypothermia; heat-production; oxygen-consumption; skeletal-muscle; electromyography; body-temperature; rats

Abstract: Diabetes mellitus and food deprivation are two conditions known to significantly reduce the ability to generate body heat during periods of acute cold stress. The purpose of this study was to determine if shivering is attenuated in the urethane-anesthetized (1.5 g/kg; i.p.), streptozotocin-induced diabetic (STZ; n = 10) and food-deprived (12-hour nocturnal fast) rat (FD; n = 11) as colonic temperature declined from baseline (36 degrees C) to 28 degrees C. Shivering was assessed using the mean rectified electromyographic (EMG) signal obtained from indwelling bipolar electrodes placed in the gluteus superficialis muscle. Although the mean rectified EMG progressively increased (P less than or equal to 0.05) between colonic temperature of 33 degrees C to 28 degrees C and achieved peak activity (7.89 +/- 1.80 microV) at 29 degrees C in non-diabetic rats, shivering activity was virtually absent in the STZ group throughout cooling (e.g. peak EMG = 0.49 +/- 0.09 microV). The lack of shivering activity in STZ could partially explain the shorter time to reach 28 degrees C (STZ, 48.5 +/- 1.5 vs CON, 136.5 +/- 23.0 min; P less than or equal to 0.05) and the divergent trends in oxygen consumption between STZ and non-diabetic rats. In the FD group, the mean peak rectified EMG activity (3.09 +/- 1.35 microV) was significantly lower (P less than or equal to 0.05) than the fed group. The peak oxygen consumption, from baseline (FD, +2.11 +/- 0.36 vs. CON, +4.51 +/- 0.50 ml O₂/min) and the time taken to reach 28 degrees C (FD, 73.4 +/- 4.2 vs CON, 136.5 +/- 23.0 min) were statistically different (p less than or equal to 0.05) between groups. The results indicate that: 1) shivering thermogenesis is severely depressed and hypothermia. rats experienced a faster decline in colonic temperature than the fed group due, in part, to the relatively greater decline in shivering activity and oxygen consumption.

115 NAL Call No.: QP501.B474

Effects of dietary palm oil on serum lipid peroxidation, antithrombin III, plasma cyclic AMP, and platelet aggregation.

Pereira, T. A.; Shahi, G. S.; Das, N. P. *Biochem-Med-Metab-Biol* v.45(3): p.326-332. (1991 June)

Includes references.

Descriptors: palm-oils; dietary-fat; lipid-peroxidation; blood-proteins; blood-coagulation; clotting; anticoagulants; platelets; c-amp; thrombosis; atheroma; atherosclerosis; rats

Abstract: Intravascular thrombus formation in association with lipid depositions in the arterial wall is thought to be involved in the process of atheroma formation. We have previously shown the beneficial effect of palm oil on the serum lipid profile (2) resulting in a lowering of serum triacylglycerol and an elevation of the HDL/LDL ratio. The present study investigates the effect of dietary palm oil on the biochemical parameters associated with clotting and platelet aggregation in young rats (70 g body wt) fed a palm oil diet over a period of 10 weeks. Palm oil-fed rats showed significantly lower levels of fibrinogen and serum lipid peroxide and elevated AtIII levels resulting in a prolongation of clotting time. Reduced platelet aggregation and ATP release associated with a prolongation of bleeding time were also found. These findings, together with our earlier findings on the effect of palm oil on the serum lipid profile, suggest that dietary palm oil may be antithrombotic as well as beneficial in preventing the deposition of lipids on the vessel wall and may, therefore, be protective against the development of atherosclerosis.

116 NAL Call No.: 389.8-J82

Effects of dietary selenium and fish oil (MaxEPA) on arachidonic acid metabolism and hemostatic function in rats.

Song, J.; Wander, R. C. *J-Nutr* v.121(3): p.284-292. (1991 Mar.)

Includes references.

Descriptors: diet; selenium; fish-oils; arachidonic-acid; metabolism; food-intake; growth-rate; blood-chemistry; rats

Abstract: This study investigated whether hemostatic function can be modified by both the consumption of fish oil and the level of dietary selenium. Male Sprague-Dawley rats were fed for 8 wk semipurified diets containing 7% corn oil (by wt) or 5.5% fish oil (MaxEPA) plus 1.5% corn oil with or without selenium supplementation. Consumption of the four diets caused no difference in weight gain, food intake or plasma malondialdehyde content. The selenium-supplemented rats had significantly higher levels of selenium and glutathione peroxidase activity in plasma. Fish oil feeding decreased ADP-induced platelet aggregation and increased bleeding time. The level of dietary selenium and type of oil interacted to influence the production of 6-keto-prostaglandin F1 alpha: more was produced when corn oil was fed in the selenium-deficient diets. These data suggest that the effect of dietary selenium on hemostatic function and the production of eicosanoids is minor.

117 NAL Call No.: 447.8-Am3

Effects of food deprivation and restriction, and metabolic blockers on food hoarding in Siberian hamsters.

Bartness, T. J.; Clein, M. R. *Am-j-physiol* v.266(4,pt.2): p.R1111-R1117. (1994 Apr.)

Includes references.

Descriptors: food-deprivation; food-restriction; food-intake; energy-intake; energy-balance; metabolic-inhibitors; body-fat; hamsters; energetics

Abstract: Syrian hamsters do not increase their food intake following several metabolic challenges, including food deprivation and blockade of metabolic fuel utilization, in contrast to the response of other small rodents to these challenges. Perhaps hamsters respond to such challenges differently, for example by altering hoarding. In the present experiments, we have begun to question the role of food hoarding in the total energy balance of Siberian hamsters. Therefore, we developed a simulated burrow system, where food was available outside the burrow for consumption and/or hoarding during a 15-h period surrounding the 8-h dark portion of the photocycle. Food hoarding, but not food intake, increased dramatically after 32- and 56-h fasts and was greater following the longer fast. Food-restricted weight-reduced hamsters (80% of ad libitum-fed controls) were refed and given the opportunity to hoard. Initially, when body weights were low, food hoarding was maximal and then decreased gradually to control levels as body weights reached those of the ad libitum-fed controls. Food intake was not affected. Neither hoarding nor food intake was affected by treatment with long-acting protamine zinc insulin, given to enhance the storage of metabolic fuels, at any dose tested. Finally, neither food intake nor hoarding was affected by treatment with the glucose utilization blocker 2-deoxy-D-glucose, the fatty acid utilization blocker methyl palmoxirate, or a combination of the two treatments, all at doses that stimulate food intake in laboratory rats. Collectively, these results show that Siberian hamsters respond to food deprivation and restriction by increasing food hoarding but not food intake; however, they do not increase their long-term energy stores (fat) than to short-term fluctuations in metabolic fuel availability. Finally, it should be noted that food intake and food hoarding were dissociated from one another, suggesting different underlying neural/ hormonal bases for the behaviors.

118 NAL Call No.: RC620.A1J6

Effects of high sugar diets on renal fluid, electrolyte and mineral handling in rats: relationship to blood pressure.

Preuss, H. G.; Memon, S.; Dadgar, A.; Gongwei, J. *J-Am-Coll-Nutr* v.13(1): p.73-82. (1994 Feb.)

Includes references.

Descriptors: diets; hypertension; sucrose; renal-function; prostaglandins; angiotensin; hormone-antagonists; glomerular-filtration; food-intake; sodium; renal-function-tests; urine-analysis; electrolytes; excretion; retention; minerals; water; rats

Abstract: Objective: We examined whether sugar-induced systolic blood pressure (SBP) elevations in rats may develop, in part, through a mechanism common to salt-induced hypertension, i.e., renal retention of water and salt. Design: Spontaneously hypertensive rats (SHR) ate four diets: two high (> 50% of calories) and two low (< 12% of calories) in sugar (sucrose). SBP, various urinary parameters, and the renal angiotensin and prostaglandin systems were assessed. Results: SHR consuming diets high in sugar showed significantly decreased urinary volume and excretion of electrolytes, which coincided with increasing SBP. When low sugar diets replaced high sugar diets, SBP and urinary parameters rapidly returned to baseline. SHR received captopril while consuming high sugar diets, and both SBP and urinary parameters assumed baseline values, comparable to ones seen in SHR consuming low sugar diets. A direct angiotensin II receptor antagonist (Dupont 753) did not influence SBP. However, we found decreased PGE2 excretion in SHR consuming excess sugar. Conclusions: Salt and water retention occur early during sugar-induced hypertension due to reduced renal excretion, consistent with some part in the pathogenesis. The effects of high sugar diets on SBP were not due to angiotensin II

inhibition, however, decreased availability of vasodilatory prostaglandins may play a role in the renal events and sugar-induced hypertension in SHR.

119 NAL Call No.: QL750.A6

Effects of housing on social preference and behaviour in male golden hamsters (*Mesocricetus auratus*).

Arnold, C. E.; Estep, D. Q. *Appl-Anim-Behav-Sci* v.27(3): p.253-261. (1990 Sept.)

Includes references.

Descriptors: golden-hamsters; social-behavior; groups; body-weight; fighting; wounds

120 NAL Call No.: QP141.A1N88

Effects of human element on efficiency of food utility in mice.

Lin, B. B.; Lai, C. C.; Chang, K. K. *Nutr-res* v.16(9): p.1555-1562. (1996 Sept.)

Includes references.

Descriptors: animal-husbandry; nutrition-physiology; skilled-labor; comparisons; animal-behavior; mortality; food-intake; animal-experiments; weight-gain; body-weight; skillful-investigators; unskillful-investigators

Abstract: To investigate the effects of human element on efficiency of food utility (EFU) in mice, we arranged a forty-two-day experimental schedule by using 210 mice for five senior skillful investigators and another five junior unskillful investigators to administer deionized water, per os, twice a day, in addition to ad libitum of deionized water and normal feed, to various groups of mice (ten mice per treatment, twenty mice for each person). Another group of mice without human disturbance was control group. Various parameters, such as the initial body weights of animals, daily food intake, daily body weight gain, body weight gain per 100 grams diet, mortality, and observation on behavioral/neurologic/autonomic signs of mice according to Irwin test, were recorded. Without human disturbance, animals had highest EFU. There was statistical significance ($P < 0.05$) of the testing results between the 100 mice treated by senior skillful investigators and another 100 mice treated by another junior unskillful investigators to show that the former 100 mice provide more acceptable results than that of the latter 100 mice. These results suggest that selecting and grouping investigators could be as important as selecting the experimental animals; and also suggest that senior skillful investigator is indispensable for experimental animal studies.

121 NAL Call No.: 410.9-P94

Effects of indwelling arterial catheters or physical restraint on food consumption and growth patterns of rats: advantage of noninvasive blood pressure measurement techniques.

O'Neill, P. J.; Kaufman, L. N. *Lab-Anim-Sci* v.40(6): p.641-643. (1990 Nov.)

Includes references.

Descriptors: rats; blood-pressure; measurement; catheters; restraint-of-animals; feed-intake; liveweight-gain; catheterization; non-invasive-techniques

122 NAL Call No.: QL55.A1L3

The effects of intracage ventilation on microenvironmental conditions in filter-top cages.

Lipman, N. S.; Corning, B. F.; Coiro, M. A. Sr. *Lab-Anim* v.26(3): p.206-210. (1992 July)

Includes references.

Descriptors: mice; cages; ventilation; microenvironments; carbon-dioxide; ammonia; relative-humidity

Abstract: Filter-top cages, while effective in reducing cross contamination by particulate material including microbes, can also cause accumulation of the waste gases carbon dioxide and ammonia as well as increased intracage relative humidity. A prototype system which provided each cage with 23 air changes per hour through a nozzle inserted in the filter lid was evaluated. The ventilated cageing system was effective in reducing intracage carbon dioxide, ammonia and relative humidity levels. Mean weekly carbon dioxide levels were 2900 ppm lower, ammonia levels 240 ppm lower and intracage relative humidity levels 8% lower in the ventilated cages than in unventilated controls.

123 NAL Call No.: QP141.A1A64

Effects of stressful noise on eating and non-eating behavior in rats.

Krebs, H.; Macht, M.; Weyers, P.; Weijers, H. G.; Janke, W. *Appetite* v.26(2): p.193-202. (1996 Apr.)

Includes references.

Descriptors: eating-patterns; noise; appetite; food-intake; mental-stress; behavior-patterns; rats

Abstract: Eating and other behaviors were measured in 36 food-deprived rats on 15 consecutive days during 20 min test sessions. During training sessions 1 to 5 all animals were habituated to the test boxes with white noise of 55 dB intensity. For sessions 6 to 10 noise intensity was increased to 95 dB for the experimental rats and to 60 dB for the control rats. The food intake of experimental rats was lower for stress session 1. The duration of eating behavior was lower, and durations of exploring, grooming and resting behaviors were higher for all stress sessions for rats exposed to 95 dB white noise. Speed of eating behavior was higher for all stress sessions in the experimental group. Defecation rate of the experimental rats was higher for all stress sessions. On post-stress sessions 11 to 15 animals were again tested under the stimulus conditions of the training period (55 dB). No significant effects were observed for this period. The results are discussed with respect to models of "stress-induced" eating and behavioral ecology.

124 NAL Call No.: QL55.F43-1993

Effects of strong experimental stimuli versus rearing conditions on open-field behaviour rats.

Hirsjarvi, P. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 77-80.*

Includes references.

Descriptors: rats; stress-factors; stress-response; fearfulness; animal-welfare; laboratory-rearing; gentling

125 NAL Call No.: 448.8-M56

Effects of the beta 2-adrenoceptor agonist, clenbuterol, on muscle atrophy due to food deprivation in the rat.

Choo, J. J.; Horan, M. A.; Little, R. A.; Rothwell, N. J. *Metab-Clin-Exp. Duluth, Minn. : W.B. Saunders Co. June 1990. v. 39 (6) p. 647-650.*

Includes references.

Descriptors: food-restriction; rats; receptors; muscles; atrophy; body-weight; protein-metabolism; fasting

126 NAL Call No.: DISS--F1994442

Effects of the cage design on intermale aggression and animals welfare in male laboratory mice. Vergleich zwischen den Auswirkungen strukturierter, bzw. standardisierter Haltungssysteme auf Aggressivität, psychosoziale Befindlichkeiten und endokrine Merkmale männlicher Labormause.

Voss, T. Hannover : [s.n.], 1994. 120 p. : ill., Thesis (doctoral)--Tierärztliche Hochschule Hannover, 1994.

127 NAL Call No.: 410.9-P94

The efficacy and safety of chlorpyrifos (Dursban) for control of *Myobia musculi* infestation in mice.

Pence, B. C.; Demick, D. S.; Richard, B. C.; Buddingh, F. *Lab-Anim-Sci* v.41(2): p.139-142. (1991 Apr.)

Includes references.

Descriptors: mice; myobia-musculi; mite-control; granules; chlorpyrifos; infestation; toxicity; controlled-release

Abstract: Mite infestation in laboratory mice is a common, but troublesome problem in animal facilities. Recommended treatment regimens are frequently ineffective because of the short period of exposure to the control agent. In an effort to develop a time-release approach, we have investigated the use of Dursban granules applied in animal bedding. Initial toxicity studies indicated that this pesticide can be added to shoebox cage litter at levels three times that used for outdoor application (6 g per 27 by 48 cm shoebox cage) without producing clinical signs of toxicity. Metabolism studies demonstrated that although individual mice showed decreased brain acetylcholinesterase activity following treatment, liver cytosolic glutathione-S-transferase, liver microsomal aminopyrine N-demethylase, or aryl hydrocarbon hydroxylase were not induced after 1 week of exposure. Parasitological studies indicated elimination of mites and itching in an experimental infestation, as well as reduction of itching in severely symptomatic, naturally infested mice, following treatment with the granules. These studies demonstrate the nontoxic efficacy of Dursban in the control of *Myobia musculi*.

128 NAL Call No.: 410.9-P94

The efficacy of a dirty bedding sentinel system for detecting Sendai virus infection in mice: a comparison of clinical signs and seroconversion.

Artwohl, J. E.; Cera, L. M.; Wright, M. F.; Medina, L. V.; Kim, L. J. *Lab-anim-sci* v.44(1): p.73-75. (1994 Feb.)

Includes references.

Descriptors: mice; murine-paramyxovirus; sentinel-animals; litter; symptoms; immune-response; strain-differences

129 NAL Call No.: 410.9-P94**Efficacy of a temperature-sensitive Sendai virus vaccine in hamsters.**

Tagaya, M.; Mori, I.; Miyadai, T.; Kimura, Y.; Ito, H.; Nakakuki, K. *Lab-anim-sci* v.45(3): p.233-238. (1995 June)

Includes references.

Descriptors: hamsters; murine-paramyxovirus; live-vaccines; histopathology; antibody-formation; noses; lungs; trachea; newborn-animals; vaccination; animal-welfare; syrian-hamsters

Abstract: A temperature-sensitive HVJ-pB strain of parainfluenza type 1 (Sendai) virus was obtained from a persistently virus-infected cell culture. Intranasal inoculation of Syrian hamsters with the HVJ-pB temperature-sensitive mutant resulted in an abortive infection but induced a specific antibody response against Sendai virus without appreciable lesions in the respiratory tract. Prior exposure to the temperature-sensitive mutant protected hamsters from subsequent challenge with virulent wild-type virus. The efficacy of protection became apparent at 5 days after vaccination and lasted for at least 720 days. For practical use of the HVJ-pB vaccine, a single intranasal administration to newborn babies aged over 15 days is recommended.

130 NAL Call No.: QL55.A1L3**Efficiency of air filter sets for the prevention of airborne infections in laboratory animal houses.**

Mrozek, M.; Zillmann, U.; Nicklas, W.; Kraft, V.; Meyer, B.; Sickel, E.; Lehr, B.; Wetzels, A. *Lab-anim* v.28(4): p.347-354. (1994 Oct.)

Includes references.

Descriptors: mice; animal-housing; air-filters; efficiency; airborne-infection; parvovirus; bacteria; disease-prevention; experimental-infection; gnotobiotic-animals; microbial-flora; barrier-husbandry; flexible-film-isolators; spf-houses; minute-virus-of-mice

Abstract: Air filter sets (classes EU6 and EU9, or EU6 and S)2 were tested for their efficiency in protecting laboratory animals against potential airborne infections. Flexible-film isolators were used as a smaller scale model. In the first experiment, lasting 7 months, it was tested whether minute virus of mice (MVM) was able to penetrate the airfilters between one isolator containing experimentally infected mice and another with MVM negative mice. In the second experiment we tested whether microorganisms in the incoming air were able to penetrate air filter sets. To assess this gnotobiotic mice in an isolator were monitored for 9 months for changes of their microbial flora. In both experiments a combination of EU6 and EU9 air filters proved to be sufficient to maintain the microbiological status of the animals. The same combination of medium efficiency filters (EU6 and EU9) is used on the air supply to 4 SPF-barrier units in which infections with MVM occurred repeatedly soon after the initial stocking. After a thorough disinfection no reinfection has been detected to date. This demonstrates that the relatively low efficiency of the air filters was not the cause of the repeated infection. The procedure for disinfection is described.

131 NAL Call No.: QL55.I5**An efficient method for the intensive production of F1 (CBA/Ca X C57BL/6) hybrid mice.**

Parnham, D. W.; Smith, L. C. *Anim-Tech-J-Inst-Anim-Tech* v.41(1): p.43-47. (1990 Apr.)

Descriptors: mice; progeny-production; crosses; reproductive-performance

Abstract: In response to a request for a regular supply of 25 four-week-old F1 (CBA/Ca X C57BL/6) female mice per week, a production system has been developed, involving the use of one standard 56-cage rack. The system has proved to be reliable, economic and easily managed. By careful selection of females, both mean litter size at birth and percentage survival to weaning showed a marked increase on that expected from either of the inbred lines.

132 NAL Call No.: QL55.A1L3**Endocrine stress response in rats subjected to singular orbital puncture while under diethyl-ether anaesthesia.**

Herck, H. v.; Baumans, V.; Boer, S. F. d.; Gugten, J. v. d.; Woerkom, A. B. v.; Beynen, A. C. *Lab-Anim* v.25(4): p.325-329. (1991 Oct.)

Includes references.

Descriptors: rats; anesthesia; ethyl-ether; stress-response; corticosterone; epinephrine; norepinephrine; blood-plasma; laboratory-methods

Abstract: In an attempt to assess possible discomfort in rats subjected to orbital puncture while under diethyl-ether

anaesthesia, their endocrine stress response was determined. Concentrations of corticosterone, adrenaline and noradrenaline were measured in plasma obtained via a jugular catheter from rats subjected to diethyl-ether anaesthesia with or without orbital puncture. No statistically significant differences were found between the punctured and non-punctured rats as to peak levels of plasma corticosterone and adrenaline as well as for the times required by the increased concentrations to return to baseline values. The rate by which the plasma noradrenaline level returned to baseline values was somewhat decreased by orbital puncture. Diethyl-ether anaesthesia alone produced a marked endocrine response when compared with handling and novelty stress associated with the induction of anaesthesia. It is concluded that diethyl-ether anaesthesia causes pronounced increases in the plasma levels of the selected stress hormones and that orbital puncture does not amplify this response. It is suggested that diethyl-ether anaesthesia masks any effects of orbital puncture.

133 NAL Call No.: 340.8-In8

Enhanced thermogenesis in rats by *Panax ginseng*, multivitamins and minerals.

Kumar, R.; Grover, S. K.; Divekar, H. M.; Gupta, A. K.; Shyam, R.; Srivastava, K. K. *Int-j-biometeorol* v.39(4): p.187-191. (1996)

Includes references.

Descriptors: panax-pseudoginseng

Abstract: Substances which enhance endurance for physical and mental work and increase non-specific resistance to stress during a prolonged stay in physiologically adverse habitats are called 'adaptogens'. *Panax ginseng* is well known for its anti-stress and adaptogenic properties. In the present study, adaptogenic activity by the intake of a herbo-vitamin-mineral preparation (HVMP) containing *P. ginseng* and multivitamin- mineral preparation (MVMP) was evaluated using the cold-hypoxia-restrained (C-H-R) animal model. The aim was to determine whether the cold tolerance and recovery from acute hypothermia mediated by *P. ginseng* was modified by simultaneous intake of additional vitamins and minerals. Results suggest that the adaptogenic effect of HVMP was more or less the sum total of its two components *P. ginseng* and MVMP. In HVMP, *P. ginseng* was found to be effective for developing resistance to cooling and MVMP helped in stimulating faster recovery from acute hypothermia.

134 NAL Call No.: QL55.I5

An enriched commune housing system for laboratory rats--a preliminary view.

Batchelor, G. R. *Anim-technol* v.44(3): p.201-214. (1993 Dec.)

Includes references.

Descriptors: rats; cages; enrichment; animal-welfare; animal-behavior

Abstract: Most current methods of housing laboratory rats allow very little enrichment to be accommodated (Figure 1). In addition, a floor space of 1600 cm² and a height of 20 cm surely does not permit normal social behaviour to occur (Figure 2). The view put forward here, therefore, is that current housing systems for rats are ethologically, physiologically and psychologically damaging, inappropriate and restrictive and should gradually be replaced. An enriched commune housing system with a view to commercial application, has been designed and constructed, albeit in a fairly crude form. A grant obtained from the RSPCA will enable video recording of social and individual behaviors to be analysed, including infra-red techniques during the hours of darkness. In addition, it is hoped that some form of activity index may be constructed to demonstrate the strong exploratory instincts that laboratory rats possess but are currently frustrated in their attempts to show. This work is in its infancy and the subject of this presentation is a preliminary, objective assessment of some of the background to some behavioural aspects of laboratory animal welfare, as well as focusing on the rat commune housing system itself.

135 NAL Call No.: QL55.F43-1993

Enteropathogenic catalase-negative cocci.

Rozengurt, N.; Sanchez, S. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 402-403.*

Poster presentation at the symposium.

Descriptors: mice; staphylococcus; diarrhea; outbreaks; animal-welfare; mortality; runting; staphylococcus-xylosus

136 NAL Call No.: QL55.I5

Environmental enrichment for laboratory mice (*Mus musculus*).

Ward, G. E.; DeMille, D. *Anim-Tech-J-Inst-Anim-Tech* v.42(3): p.149-156. (1991 Dec.)

Includes references.

Descriptors: mice; environment; enrichment; cages; bottles; animal-behavior

Abstract: The mouse, (*Mus musculus*), is commonly distributed throughout all continents of the world and must be considered as one of the most successfully adapted animal species on earth. Thorburn, (1921) described the natural habits of this animal species and commented upon its preferred occupation of dwelling houses "even before they were completed". This same author described the mouse as a good climber and also its gnawing abilities used to enter cupboards and store rooms in order to nest and rear its young. In addition and more recently, other authors have considered that laboratory mouse populations are tightly organised into territorially restricted social units. DeFries and Mclearn, 1972, Lidicker, 1976), with evidence that mice adopt unambiguously territorial behaviour in large enclosures which may be very stable, (Crowcroft, 1955). There is also evidence of aggressive behaviour toward migrant animals through these territories, (Reimer and Petras, 1967). It is within this framework that we must consider the standard laboratory mouse which, whilst being genetically manipulated during many generations to produce an animal model markedly different to its ancestors, nevertheless still retains most if not all of the characteristics of its wild forbears, such as curiosity, adaptability, intelligence and male aggression. With all of these inherent characteristics, it must be considered as doubtful whether the current bland and unenriched laboratory animal cage environment is either sufficient or able to fulfil the legitimate requirements of this species.

137 NAL Call No.: 410.9-P94

Environmental stability and transmission of rat virus.

Yang, F. C.; Paturzo, F. X.; Jacoby, R. O. *Lab-anim-sci* v.45(2): p.140-144. (1995 Apr.)

Includes references.

Descriptors: rats; laboratory-animals; parvovirus; disease-transmission; cages; infectivity; age-differences; airborne-infection

Abstract: The environmental stability and transmission of a field isolate of rat virus was tested under conditions resembling those that may be encountered during the housing of laboratory rats. The rat virus kept in physiologic salt solutions at room temperature remained infective for at least 5 weeks. Similar virus preparations remained infective after drying on a plastic surface for 3 to 5 weeks, depending on initial virus concentration. Varying the protein concentration in the medium had no significant effect on stability. Bedding from cages housing infected litters induced seroconversions in sentinel rats for at least 5 weeks after storage of rat virus at room temperature. Infection was transmitted between rats housed in open cages in a Trexler isolator but not between rats housed in microisolator cages connected by tunnels partitioned by wire screens with mesh size of 1.67 mm. The results indicate that rat virus can remain infective after prolonged exposure to an ambient environment and suggest that infection is more readily transmitted by animal-to-animal contact or by fomites than by aerosolization of exhaled virus.

138 NAL Call No.: QL55.F43-1993

Enzymatic amplification of *Mycoplasma pulmonis* RNA as a diagnostic tool for the identification of infected laboratory rats.

Logt, J. T. M. v. d.; Kuppeveld, F. J. M. v.; Kissing, J.; Melchers, W. J. G. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 393-394.*

Poster presentation at the symposium.

Descriptors: rats; polymerase-chain-reaction; in-vitro-culture; laboratory-diagnosis; mycoplasma-pulmonis; accuracy; strain-differences; sensitivity

139 NAL Call No.: 410.9-P94

Enzyme-linked immunosorbent assay for detection of antibody to lymphocytic choriomeningitis virus in mouse sera, with recombinant nucleoprotein as antigen.

Homberger, F. R.; Romano, T. P.; Seiler, P.; Hansen, G. M.; Smith, A. L. *Lab-anim-sci* v.45(5): p.493-496. (1995 Oct.)

Includes references.

Descriptors: mice; lymphocytic-choriomeningitis-virus; elisa; blood-serum; immunofluorescence; antibody-formation; antibody-testing; accuracy

Abstract: An enzyme-linked immunosorbent assay (ELISA) was developed for the detection of antibody lymphocytic choriomeningitis virus (LCMV) in mouse sera. This assay is based on recombinant LCMV nucleo-protein generated in a baculovirus system. Sera from experimentally and naturally infected as well as non-infected mice were tested, and the results were compared with those obtained from an established immunofluorescence assay (IFA) that uses infected cells as antigen. An excellent correlation was found; the ELISA specificity and sensitivity were calculated to be 100 and 95% respectively. Unlike the IFA, this ELISA does not require the handling of infective virus. It eliminates the need to work with a zoonotic agent in the laboratory while allowing effective screening of laboratory mouse populations for LCMV antibody.

140 NAL Call No.: QD501.M63

Enzymes of carbohydrate metabolism in young and adult rats fed diets differing in fat and carbohydrate.

Brooks, S. P. J.; Lampi, B. J. *Mol-cell-biochem* v.159(1): p.55-63. (1996 June)

Includes references.

Descriptors: dietary-fat; dietary-carbohydrate; lipogenesis; glycolysis; gluconeogenesis; glycogen; glycogen-phosphorylase; pyruvate-kinase; glucose-6-phosphate-dehydrogenase; glycerol-3-phosphate-dehydrogenase; malic-enzyme; atp-citrate-lyase; fatty-acid-synthase; hexokinase; pyruvate-dehydrogenase-lipoamide; enzyme-activity; regulation; diet; starvation; muscles; liver; rats

Abstract: Glycogen content as well as glycolytic, gluconeogenic and fatty acid synthesis enzyme activities were monitored in young and adult male rats fed diets differing in fat content: 11% (low), 22% (medium) and 42% (high) of total energy from fat. The results showed significant differences in the responses of young and adult rats to changes in dietary fat and carbohydrate. In young animals, increasing dietary fat decreased total liver glycogen phosphorylase (GP), pyruvate kinase (PK), glycerol 3-phosphate dehydrogenase, glucose 6-phosphate dehydrogenase, malic enzyme (ME), ATP-citrate lyase (ATP-CL) and fatty acid synthase (FAS). Increasing dietary fat also affected enzyme levels in other tissues: hexokinase (HK) and pyruvate dehydrogenase (PDH) activities decreased whereas skeletal muscle PK activity increased. The pattern of enzyme changes was similar in livers of fed adults with the exception that liver GP was not affected by dietary manipulations. Overnight food deprivation decreased liver glucokinase (GK), ME, ATP-CL, and FAS activities and increased liver phosphoenolpyruvate carboxykinase (PEPCK) and phosphofructokinase in both young and adult animals. In young animals, food deprivation also: (i) reduced liver GK and PK, (ii) increased kidney PEPCK, (iii) decreased muscle PEPCK and (iv) decreased kidney PDH. Food-deprived adults had increased skeletal muscle PEPCK and kidney glycogen synthetase as well as decreased kidney PEPCK muscle GP activity. These differences suggest that young animals are somewhat more responsive to changes in dietary manipulations. They also show that overnight food restriction causes a more profound metabolic re-organization in younger than in.

141 NAL Call No.: 410.9-P94

Eradication of pinworms (*Syphacia obvelata*) from a large mouse breeding colony by combination oral anthelmintic therapy.

Lipman, N. S.; Dalton, S. D.; Stuart, A. R.; Arruda, K. *Lab-anim-sci* v.44(5): p.517-520. (1994 Oct.)

Includes references.

Descriptors: mice; gnotobiotic-animals; syphacia-obvelata; nematode-infections; piperazine; ivermectin; drug-combinations; spf-husbandry; oral- administration; drug-therapy; specific-pathogen-free-animals; piperazine-sulfate

142 NAL Call No.: QL55.F43-1993

Euthanasia methods used for laboratory animals in The Netherlands.

Baumans, V.; Bartels, H. L.; Bertens, A. P. M. G.; Herck, H. v.; Hoenderken, R.; Schlingmann, F. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 219-223.*

Includes references.

Descriptors: laboratory-animals; euthanasia; species-differences; consciousness; animal-welfare; injection; anesthesia; laboratory-methods; rats; mice; evaluation; netherlands

143 NAL Call No.: 410.9-P94

Evaluation of countermeasures for reduction of mouse airborne allergens.

Sakaguchi, M.; Inouye, S.; Miyazawa, H.; Kamimura, H.; Yamazaki, S. *Lab-Anim-Sci* v.40(6): p.613-615. (1990 Nov.)

Includes references.

Descriptors: allergens; mice; sex-differences; air-filters; litter; maize-cobs; prealbumin; albumins; air; occupational-hazards

Abstract: Three kinds of countermeasures for reduction of mouse airborne allergens were evaluated with use of an air sampler and immunochemical methods. Mouse cages and the sampler were placed inside a flexible-film isolator, and concentrations of mouse major allergens in the air were measured. The levels of the airborne allergens, prealbumin and albumin, generated by 10 males, were 3,050 and 492 pg/m³, respectively. Those by 10 females were lower, 317 and 270 pg/m³, respectively. When mouse cages were covered with a filter cap, the airborne allergens inside the isolator were decreased by 90%. When corncob was used as bedding in place of wood shavings, the airborne allergens were decreased by 57 and 77%, respectively. Therefore, for reduction of mouse airborne allergens, we recommend using female mice, covering the cages with filter caps, and using corncob bedding.

144 NAL Call No.: DISS--F1994578

Evaluation of housing conditions for laboratory mice and rats : the use of preference tests for studying choice behaviour = evaluatie van huisvestingsomstandigheden voor proefdieren.

Blom, H. J. M. [Utrecht? : s.n., 1994?] 138 p. : ill., Summary also in Norwegian.

Descriptors: Rats-as-laboratory-animals-Housing; Mice-as-laboratory-animals-Housing

145 NAL Call No.: QL55.A1L3

Evaluation of isolator caging systems for protection of mice against challenge with mouse hepatitis virus.

Lipman, N. S.; Corning, B. F.; Saifuddin, M. *Lab-Anim* v.27(2): p.134-140. (1993 Apr.)

Includes references.

Descriptors: mice; cages; viral-hepatitis

Abstract: Two isolator caging systems were evaluated against challenge with MHV-Y, an enterotropic strain of mouse hepatitis virus. The systems were similar in that they both used an identical shoebox cage equipped with a polycarbonate filter top incorporating a Reemay filter. They differed in that one system supplied HEPA-filtered air through a grommet in the filter lid so that the cage was pressurized slightly. A rack holding 60 cages (30 front and back) was utilized. Thirty cages without filter tops housed one mouse each that had been infected orally with 19000 ID₅₀ of MHV-Y and an uninfected cagemate. The remaining 30 cages, each housing 2 uninfected mice were divided into 3 groups of 10 cages. Group I cages (controls) had no Alter top; Group II cages were equipped with filter tops; and Group III were equipped with filter tops and intracage HEPA-filtered air. The cages housing uninfected mice were interspersed between, above, below and behind cages housing infected mice. The uninfected mice were maintained in contact with the MHV-Y infected mice for 8 weeks. Transmission of MHV-Y was determined serologically by indirect ELISA. All mice housed within the Group I cages (control) seroconverted to MHV, while only 4 mice (2 cages) seroconverted in Group II, and no mice seroconverted in Group III.

146 NAL Call No.: RM214.N8

Excess dietary methionine decreases indices of copper status in the rat.

Strain, J. J.; Lynch, S. M. *Ann-Nutr-Metab. Basel : S. Karger. Mar/Apr 1990. v. 34 (2) p. 93-97.*

Includes references.

Descriptors: diet; nutrient-excesses; methionine; nutritional-state; copper; rats

Abstract: Two groups (n = 5) of male weanling Wistar rats were housed individually and fed copper (Cu)-deficient (0.5 mg Cu/kg) diets either with or without methionine supplementation (18 g/kg) for 49 days. Plasma caeruloplasmin (EC 1.16.3.1) and erythrocyte superoxide dismutase (EC 1.15.1.1, CuSOD) activities were measured in blood. Tissue Cu levels and the activities of cytochrome c oxidase (EC 1.9.3.1, CCO) and CuSOD were measured in the heart and liver. Hepatic activities of the sulfhydryl-sensitive enzymes, creatine kinase (EC 2.7.3.2), fumarase (EC 4.2.1.2) glutathione S-transferase (EC 2.5.1.18) and lipoamide dehydrogenase (EC 1.6.4.3) were also measured. Apart from cardiac CCO activity all of the measured indices of Cu status were found to be significantly (p < 0.05) decreased in the methionine supplemented rats. Although fumarase activity was significantly (p < 0.05) decreased in the methionine-supplemented animals compared with controls, the activities of the other sulfhydryl-sensitive enzymes were not significantly decreased. These results suggest that some of the toxic effects of excess dietary methionine may be mediated through interference with copper metabolism rather than through the previously postulated inhibition of sulfhydryl-sensitive enzymes by metabolites of methionine.

147 NAL Call No.: 447.8-AM3

Exercise-induced sympathetic FFA mobilization in VMH-lesioned rats is normalized by fasting.

Balkan, B.; Dijk, G. v.; Strubbe, J. H.; Bruggink, J. E.; Steffens, A. B. *Am-J-Physiol* v.262(6,pt.2): p.R981-R985. (1992 June)

Includes references.

Descriptors: obesity; food-deprivation; lipid-metabolism; fatty-acids; glucose; insulin; hypothalamic-lesions; exercise; sympathetic-nervous-system; ventromedial-hypothalamic-lesions; free-fatty-acid-metabolism

Abstract: This study investigates whether reduced sympathetic responses during physical exercise in ventromedial hypothalamus (VMH)-lesioned obese rats are the direct result of damage to hypothalamic circuits or a secondary effect of the altered metabolism in obesity. Obese, VMH-lesioned rats and lean controls were deprived of food for 48 h and submitted to 15 min of swimming. Food-deprived lean and obese rats displayed increased free fatty acid mobilization and utilization, whereas blood glucose concentrations were decreased. Basal plasma insulin levels were reduced by fasting in both groups, when compared with the ad libitum situation, but remained higher in the obese animals. Fasting augmented the norepinephrine response of the obese rats, resulting in equal profiles in lean and obese animals. These results indicate that VMH-lesioned animals are able to increase the sympathetic activation of adipose tissue during exercise to overcome an energy deficiency. Therefore, the function of the VMH in the regulation of the sympathetic nervous system controlling metabolism can be taken over by redundant mechanisms. The reduced sympathetic activity in ad libitum fed VMH-lesioned animals is therefore likely to be the result of the altered metabolism.

148 NAL Call No.: 410.9-P94**Failure of a soiled bedding sentinel system to detect cilia-associated respiratory bacillus infection in rats.**

Cundiff, D. D.; Riley, L. K.; Franklin, C. L.; Hook, R. R. Jr.; Besch Williford, C. *Lab-anim-sci* v.45(2): p.219-221. (1995 Apr.)

Includes references.

Descriptors: rats; sentinel-animals; bacillus; bacterial-diseases; animal-welfare; litter; disease-transmission

149 NAL Call No.: 410.9-P94**Familial dysmyelination in a Long Evans rat mutant.**

Delaney, K. H.; Kwiecien, J. M.; Wegiel, J.; Wisniewski, H. M.; Percy, D. H.; Fletch, A. L. *Lab-anim-sci* v.45(5): p.547-553. (1995 Oct.)

Includes references.

Descriptors: rats; congenital-tremor; myelin; myelination; mutants; spinal-cord; pedigree; histopathology; recessive-lethals; cells; familial- incidence; oligodendrocytes

Abstract: Tremors were observed in 15 Long Evans rats beginning at 10 to 12 days of age. These were followed by progressively worsening ataxia, hind limb paresis, episodes of immobility, and seizures by 5 to 14 weeks. Gross lesions were not observed at necropsy in rats euthanized and perfused at 4 to 16 weeks of age. Neurohistologic examination revealed dysmyelination in the central nervous system. Astrogliosis in the white matter with marked increase of expression of the glial fibrillary acid protein marker was accompanied by diffuse microgliosis. Scattered glial cells, interpreted to be oligodendrocytes, contained minute periodic acid-Schiff-positive cytoplasmic granules. Large mineralized periodic acid-Schiff-positive and laminated structures were observed in the cerebellar white matter, midbrain, and thalamus of rats over 6 weeks old. Neuronal degeneration and loss was evident in the cortex, hippocampus, and midbrain. Large axonal spheroids were found the ventral and lateral funiculi of the spinal cord. An ultrastructural study of four affected rats revealed almost complete absence of myelinated axons and normal sheaths, and degeneration and necrosis of oligodendrocytes. The Long Evans shaker rat represents a novel myelin mutant with a remarkable survival period and appears to have an autosomal recessive mode of inheritance.

150 NAL Call No.: SF459.M5H48--1992**Fancy mice.**

Henwood, C. Neptune City, NJ : T.F.H. Publications, c1992. 93 p. : col. ill., "KW-224"--Spine.

Descriptors: Mice-as-pets

151 NAL Call No.: QP141.A1A64**Fat appetite in rats: the response of infant and adult rats to nutritive and non-nutritive oil emulsions.**

Ackroff, K.; Vigorito, M.; Sclafani, A. *Appetite* v.15(3): p.171-188. (1990 Dec.)

Includes references.

Descriptors: appetite; dietary-fat; maize-oil; mineral-oils; stimuli; age-differences; food-preferences; food-deprivation; nutritive-value; food-intake; palatability; animal-experiments; rats

Abstract: Fat appetite was studied in rats using corn oil and mineral oil emulsions. In Experiment 1 ingestive responses to intraoral infusions were measured in rat pups 6-15 days of age. By 12-15 days of age pups responded more to oil emulsions (10% and 30%) than they did to water or emulsifier solution. The corn and mineral oil emulsions were almost as effective as milk but less effective than sucrose (0.3 M) in stimulating ingestion. Experiments 2 and 3 examined the acceptance and preference for oil emulsions in adult rats. The corn oil and mineral oil emulsions were equally acceptable on non-deprived rats, as measured by 3-min and 30-min one-bottle tests. Food deprivation increased the one-bottle intake of both emulsions. In two-bottle tests, rats displayed a slight corn oil preference when non-deprived, but developed a strong preference when food deprived. Taken together, the results suggest that rats have an unlearned attraction to the orosensory qualities of emulsified oils and they learn to prefer corn oil based on its postingestive nutritive effects.

152 NAL Call No.: QP1.P4

Feeding conditions and estrous cycle of female rats under the activity-stress procedure from aspects of anorexia nervosa.

Watanabe, K.; Hara, C.; Ogawa, N. *Physiol-Behav* v.51(4): p.827-832. (1992 Apr.)

Includes references.

Descriptors: anorexia-nervosa; food-restriction; feeding-behavior; activity; stress; food-intake; body-weight; estrous-cycle; mortality; gastric-ulcer; histopathology; animal-models; female-animals; rats

Abstract: The present study investigated the application of female rats with activity stress as an animal model for anorexia nervosa. Young female rats were singly housed in activity-wheel cages with food-restricted schedule (2, 3, or 4 h of food availability per day) for 3 weeks. Estrous cycle, body weight, food intake, and wheel revolution were recorded daily. Gastric pathology was also observed using the endoscopic technique. Rats that were subjected to either a 3- or 4-h feeding schedule exhibited the cessation of estrous cycle, loss of body weight, and suppression of food intake. These animals also showed a remarkable increase in running activity. However, they had no gastric lesions throughout the experimental period. On the contrary, the 2-h feeding schedule elicited severe gastric lesions and high mortality. The results suggest that behavioral and physiological changes of the young female rats with 3 or 4 h feeding share some symptoms of anorexia nervosa, although their anorexia is not self starvation.

153 NAL Call No.: QL55.F43-1993

Fetal malformations and maternal alphafetoprotein levels in curly tail (ct) mice.

Hau, J.; Jensen, H. E. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 370-372.*

Poster presentation at the symposium.

Descriptors: mice; genetic-disorders; fetal-development; blood-serum; alpha-fetoprotein

154 NAL Call No.: QL55.I5

The floor pen for laboratory animals--a mixed blessing.

Davys, J. S. *Anim-technol* v.45(2): p.95-100. (1994 Aug.)

Includes references.

Descriptors: rabbits; guinea-pigs; floor-pens; animal-welfare; laboratory-rearing

155 NAL Call No.: QL55.F43-1993

Folates and development.

Raynaud, F.; Horvath, C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 435-436.*

Poster presentation at the symposium.

Descriptors: rats; pregnancy; folic-acid; folate-antagonists; intraperitoneal-injection; congenital-abnormalities; tissues; embryos; pyrimethamine

156 NAL Call No.: 447.8-AM3**Food deprivation- and palatability-induced microstructural changes in ingestive behavior.**

Davis, J. D.; Perez, M. C. *Am-J-Physiol* v.264(1,pt.2): p.R97-R103. (1993 Jan.)

Includes references.

Descriptors: food-deprivation; palatability; sucrose; ingestion; feeding-behavior; rats; licking-behavior

Abstract: The effects of 17 h food deprivation and stimulation by five concentrations (0.05-0.8 M) of sucrose solutions on the licking behavior of rats were investigated. Food deprivation increased the intake of the three lowest concentrations (0.05, 0.1, and 0.2 M) but had no effect on the volume ingested of the two highest concentrations (0.4 and 0.8 M). Food deprivation had no significant effect on the duration of the meals of any of the sucrose solutions; rather it affected the rate of ingestion. In those cases where food deprivation did affect volume intake, it did so by increasing the initial rate of ingestion. Although food deprivation had no effect on the volume ingested of the two strongest concentrations of sucrose, it nevertheless affected the ingestive behavior by increasing the duration of the sustained periods of bursts of licking and decreasing their number. Deprivation also, significantly decreased the rate of licking within these sustained bouts of licking. The results indicate that food deprivation can affect the ingestive behavior of rats in ways that are not revealed by measuring volumetric intake alone. The data also support the view that food deprivation increases the palatability of the test solutions.

157 NAL Call No.: QP141.A1A64**Food deprivation reduces rats' oil preference.**

Ramirez, I. *Appetite* v.21(1): p.53-67. (1993 Aug.)

Includes references.

Descriptors: oils; food-preferences; food-deprivation; appetite; rats

Abstract: Rats normally prefer dilute oil suspensions over vehicle, but this preference can be abolished by exposing them to dilute oil suspensions during a period of food deprivation. In the first series of experiments, rats were given a choice of 0.5-0.9% triolein vs. vehicle for 4 consecutive days each week for 3 weeks. Food was available ad libitum on days 1, 2 and 4; no food was available on day 3. Preference for oil suspension dropped sharply after, but not during, each occasion that food was withheld. Similar experiments using starch, Polycose, or sucrose did not show comparable deprivation-induced changes in preference. The second series of experiments included separate control and experimental groups. The experimental group was food deprived for 1 day when test fluids were available. The control group was food deprived the day after the test fluids were available. Food was returned and the test fluids were removed for a few days. Fluid preference was then retested with food available ad libitum. After this cycle of two preference tests was repeated 1-2 times, the experimental group showed substantially lower oil preference than did the control group. Similar results were obtained with 0.5% triolein, 0.5% soybean oil, and 5% soybean oil. A similar experiment in which a vanillin-citral flavor was used instead of oil did not show such an effect. However, preference for the vanillin-citral flavor was decreased in rats exposed to a mixture of this flavor and oil while they were food deprived. It is proposed that rats readily learn to associate oil flavor, but not other flavors, with the aversive effects of food deprivation.

158 NAL Call No.: 80-Ac82**Gastroprotective effects in the rat of a new flavonoid derivative.**

Speroni, E.; Ferri, S. *Acta-hortic* (332): p.249-252. (1993 Aug.)

Paper presented at the First World Congress on Medicinal and Aromatic Plants for Human Welfare (WOCMAP): pharmacology, phytotherapy, human welfare, regional aspects on July 19-25, 1992, Maastricht, Netherlands.

Descriptors: rats; flavonoids; derivatives; prostaglandins; stomach-mucosa; disease-prevention

159 NAL Call No.: SF407.R38G46**Genetic monitoring of inbred strains of rats : a manual on colony management, basic monitoring techniques, and genetic variants of the laboratory rat.**

Hedrich, H. J.; Adams, M. M.; International Council for Laboratory Animal Science. Stuttgart ; New York : Gustav Fischer Verlag, 1990. xii, 539 p. : ill., Includes bibliographical references and index.

Descriptors: Rats-as-laboratory-animals; Rats-Genetics; Rats-Breeding; Inbreeding

160 NAL Call No.: QL55.F43-1993**Genetic monitoring of mouse closed colonies.**

Katoh, H.; Wakana, S.; Ebukuro, M.; Nomura, T. *Welfare and science proceedings of the Fifth Symposium of the Federation*

of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 437-438.

Poster presentation at the symposium.

Descriptors: mice; gene-frequency; genetic-polymorphism; genetic-drift; strain-differences

161 NAL Call No.: QL55.F43-1993

Germ-free mice and infectious disease.

Bleby, J.; Miranda, N.; Rozengurt, N. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 469-471.*

Poster presentation at the symposium.

Descriptors: mice; spf-husbandry; escherichia-coli; pathogenesis; histopathology; parainfluenza-1-virus

162 NAL Call No.: 447.8-AM3

Glucocorticoids activate the ATP-ubiquitin-dependent proteolytic system in skeletal muscle during fasting.

Wing, S. S.; Goldberg, A. L. *Am-J-Physiol* v.264(4,pt.1): p.E668-E676. (1993 Apr.)

Includes references.

Descriptors: food-deprivation; proteolysis; skeletal-muscle; glucocorticoids; atp; ubiquitin; biochemical-pathways; rats

Abstract: Glucocorticoids are essential for the increase in protein breakdown in skeletal muscle normally seen during fasting. To determine which proteolytic pathway(s) are activated upon fasting, leg muscles from fed and fasted normal rats were incubated under conditions that block or activate different proteolytic systems. After food deprivation (1 day), the nonlysosomal ATP-dependent process increased by 250%, as shown in experiments involving depletion of muscle ATP. Also, the maximal capacity of the lysosomal process increased 60-100%, but no changes occurred in the Ca²⁺-dependent or the residual energy-independent proteolytic processes. In muscles from fasted normal and adrenalectomized (ADX) rats, the protein breakdown sensitive to inhibitors of the lysosomal or Ca²⁺-dependent pathways did not differ. However, the ATP-dependent process was 30% slower in muscles from fasted ADX rats. Administering dexamethasone to these animals or incubating their muscles with dexamethasone reversed this defect. During fasting, when the ATP-dependent process rises, muscles show a two- to threefold increase in levels of ubiquitin (Ub) mRNA. However, muscles of ADX animals failed to show this response. Injecting dexamethasone into the fasted ADX animals increased muscle Ub mRNA within 6 h. Thus glucocorticoids activate the ATP-Ub-dependent proteolytic pathway in fasting apparently by enhancing the expression of components of this system such as Ub.

163 NAL Call No.: 410.9-P94

Granulomatous inflammation of the oropharyngeal cavity as a possible cause for unexpected high mortality in a Fischer 344 rat carcinogenicity study.

Germann, P. G.; Ockert, D. *Lab-anim-sci* v.44(4): p.338-343. (1994 Aug.)

Includes references.

Descriptors: rats; mortality; mouth; pharynx; trachea; inflammation; histopathology; strain-differences; force-feeding; ph; solvents; glands- animal; granuloma; cannulae; sprague-dawley-rats; sero-mucinous-glands; gavage-tubes

Abstract: An unexpected, high, test-substance-unrelated mortality has been found predominantly in female Fischer 344 rats of a 2-year gavage carcinogenicity study, which is still in the active phase. Most of the dead animals (53%) had an impacted food or bedding bolus in the oropharyngeal cavity. Histologic evaluation of this area revealed a calcified, granulomatous inflammation of the sero-mucinous glands (60%), frequently accompanied by papillary projections (50%) into the lumen. Additionally, decentral islet formation of the tracheal cartilage was evident in all animals examined. We assume that the partial blockage of the oropharyngeal lumina was the cause of death, because other possible factors were ruled out. To detect a possible strain-related predisposition, Fischer 344 and Sprague Dawley rats that had been used for technician gavage training were studied. Granulomas and papillary projections, as well as the decentral islet formation in the tracheal cartilage, however, were found in gavaged Fischer 344 but not Sprague Dawley rats. We consider the high mortality to be related to three factors: a predisposition of the Fischer 344 rat strain, an unphysiological pH of the solvent (pH 10), and chronic irritation due to an inflexible, metallic gavage tube.

164 NAL Call No.: SF601.V523

Guinea pigs.

Quesenberry, K. E. *Vet-clin-North-Am,-Small-anim-pract. Philadelphia : W. B. Saunders Co., 1979-. Jan 1994. v. 24 (1) p. 67-87.*

In the series analytic: Exotic pet medicine, II / edited by Katherine E. Quesenberry and Elizabeth V. Hillyer.

Descriptors: guinea-pigs; veterinary-medicine; animal-diseases; anesthesia; animal-husbandry; animal-anatomy; animal-physiology

165. NAL Call No.: **Slide-no.434**

Guinea pigs : care and management. Guinea pigs : care and management.

Ermeling, B. L., Fish, R. E. & University of Washington. Health Sciences Center for Educational Resources. Seattle, WA : Produced and distributed by the Health Sciences Center for Educational Resources, University of Washington, 1992. 62 slides : col. + 1 sound cassette (25 min.) + 1 guide..

Developed for the American College of Laboratory Animal Medicine.

Descriptors: Guinea-pigs/ Laboratory-animals

Abstract: Covers environment, nutrition, housing, breeding, sanitation, identification, and disease recognition and prevention.

166. NAL Call No.: **Slide-no.433**

Guinea pigs : noninfectious diseases. Guinea pigs : noninfectious diseases.

Terril, L. A., Clemons, D. J., Wagner, J. E. & University of Washington. Health Sciences Center for Educational Resources. Seattle, WA : Produced and distributed by the Health Sciences Center for Educational Resources, University of Washington, 1992. 47 slides : col. + 1 sound cassette (26 min.) + 1 guide..

Developed for the American College of Laboratory Animal Medicine.

Descriptors: Guinea-pigs-Diseases/ Laboratory-animals-Diseases

Abstract: Covers recognition, significance, cause, diagnosis, treatment and control of common nutritional, metabolic, management-related, neoplastic, and other noninfectious diseases.

167 NAL Call No.: **SF459.G9B4413-1991**

Guinea pigs : proper care and understanding : expert advice for appropriate maintenance. Meerschweinen. English.

Behrend, K. New York : Barron's, c1991. 63 p. : ill. (some col.), Translation of: Meerschweinen.

Descriptors: Guinea-pigs-as-pets

168 NAL Call No.: **SF407.M5H35-1991**

Handbook on genetically standardized JAX mice. 4th ed. Genetically standardized JAX mice.

Green, M. C.; Witham, B. A.; Jackson Laboratory (Bar Harbor, Me. Bar Harbor, ME : Jackson Laboratory, 1991. 96 p. : ill., Includes bibliographical references and index. Inbred strains and F1 hybrids -- Recombinant inbred (RI) strains -- Histocompatibility and other cellular antigens -- Genetic polymorphisms and mutations -- Chromosome aberrations -- Transgenic mice -- Mouse DNA resource -- Cryopreservation -- General references for information on mice -- General husbandry -- Inquiries and requests for mice.

Descriptors: Mice-as-laboratory-animals; Inbreeding; Mice,-Inbred-Strains-handbooks

169 NAL Call No.: **389.8-Z33**

Handling during suckling alters rat behavior but does not reverse the deleterious effects of undernutrition on naltrexone-induced inhibition of exploratory activity.

Rocha, J. B. T.; Fernando de Mello, C. *Int-j-vitam-nutr-res* v.64(2): p.152-156. (1994)

Includes references.

Descriptors: undernutrition; stimulation; animal-behavior; handling; naltrexone; exploration; dosage-effects; responses; body-weight; posture; sucklings; rats

Abstract: The effects of undernutrition during suckling, early environmental stimulation and naltrexone administration on the locomotor activity test were investigated in adult rats. Young rats were undernourished from delivery until weaning (23 days) by feeding their dams a diet containing 7% casein diet. Mothers of well-nourished rats were fed a 25% casein diet. After weaning, both groups of rats received standard lab chow. From day 2 to day 8 after delivery the animals were stimulated by being placed individually in plastic containers for 4 minutes. From day 12 to 19 the litters were removed from their home cages and placed for 10 min in plastic cages. Exploratory behavior was assessed using a biocompartmentalized open field. The number of crossings from one compartment to the other and the number of rearings were recorded.

Undernourished animals crossed less frequently than control animals and presented a higher latency to the first crossing response. Early handling increased the total number of rearing responses regardless of nutritional treatment. Naltrexone administration caused a dose-dependent reduction in the number of rearing responses only in the well-nourished group.

170 NAL Call No.: 410.9-P94

Health effects of water restriction to motivate lever-pressing in rats.

Hughes, J. E.; Amyx, H.; Howard, J. L.; Nanry, K. P.; Pollard, G. T. *Lab-anim-sci* v.44(2): p.135-140. (1994 Apr.)

Includes references.

Descriptors: rats; conditioning; water-deprivation; animal-health; safety

Abstract: The objectives were to determine the degree of water restriction necessary and sufficient to motivate operant behavior in rat and the physiologic and general health effects of chronic daily water restriction. Ovariectomized Long-Evans rats were deprived of water for 21, 14, or 7 h per day and allowed to press a lever to earn a drop of water. The 21-h group acquired the response, but the 14-h and 7-h groups did not. Once the response was acquired, all three restriction levels supported leverpressing, but the lower levels supported lower rates. After 3 months on the restriction schedules, there were no differences from similarly restricted nonbehavioral subjects or ad-libitum controls in growth rate (except for early transient weight loss), appearance of organs and tissues at gross necropsy, hematologic examination, or clinical chemical analysis. The results demonstrate the necessity and safety of the 21-h restriction schedule for behavioral work.

171 NAL Call No.: 389.8-J82

High casein-lactalbumin diet accelerates blood coagulation in rats.

Chan, K. C.; Lou, P. P.; Hargrove, J. L. *J-nutr* v.123(6): p.1010-1016. (1993 June)

Includes references.

Descriptors: diet; casein; lactalbumin; blood-coagulation-factors; experimental-diets; protein-intake; dietary-protein; rats

Abstract: This study investigates the influence of a high protein intake on normal hemostasis, fluid balance and organ growth. Adult rats were fed semipurified diets that contained either 18 or 56 g/100 g casein-lactalbumin for 2 wk, and the following functions were measured: food and water intake, weight gain, blood pressure, bleeding and clotting time, ADP-stimulated platelet aggregation, thrombin time, prothrombin time and partial thromboplastin time. Although food intake was depressed by the high protein diet, weight gain was not affected by the regimen. Water consumption, 24-h urine excretion and kidney weight were significantly greater in rats fed the high protein diet than in controls. High protein intake resulted in shorter barbiturate-induced sleeping time. Bleeding time and clotting time were significantly lower in rats fed the high protein diet for 7 d. However, heart rate, mean arterial pressure, plasma protein and osmolarity, platelet aggregation, prothrombin time, partial thromboplastin time and thrombin time did not differ significantly. Because a high protein intake caused rapid coagulation of blood in rats without affecting the activity of clotting factors, we suggest that this diet sensitized rats to factors that initiate clotting in vivo.

172 NAL Call No.: HV4701.A62

Historical control data for development and reproductive toxicity studies using the Crl:CD BR Rat.

Lang, P. ed. *Collection of papers, Animal Welfare Information Center US. Sept 1993. [1] 28 p.*

Includes references.

Descriptors: rats; strains; controls-experimental; abnormalities; incidence; reproduction; skeleton; litters; fetus; statistical-data

173 NAL Call No.: QL55.H8

A home for a mouse.

Lawlor, M. *Hum-innov-altern. Washington Grove, MD : Psychologists for the Ethical Treatment of Animals, c1991-. 1994. v. 8 p. 569-573.*

Includes references.

Descriptors: mice; cages; animal-behavior; animal-welfare; senses; social-behavior

174 NAL Call No.: 410-B77

Housing and welfare in laboratory rats: time-budgeting and pathophysiology in single-sex groups.

Hurst, J. L.; Barnard, C. J.; Hare, R.; Wheeldon, E. B.; West, C. D. *Anim-behav* v.52(pt.2): p.335-360. (1996 Aug.)

Includes references.

Descriptors: rats; animal-housing; floor-space; social-dominance; animal-welfare; loose-housing; agonistic-behavior; animal-behavior; blood-serum; corticosterone; testosterone; igg; kidneys; adrenal-glands; thymus-gland; testes; social-classes; aggressive-behavior; sex-differences; body-weight; physiopathology; sleep

Abstract: Alderley Park (Wistar-derived) rats, *Rattus norvegicus*, were maintained in single-sex groups of eight for 9 weeks under open-room conditions. Both sexes could be categorized into more or less discrete social classes based on the directionality of aggression within dyads. The difference in the number of aggressive acts initiated and received (agonistic score) provided a measure of social pressure for each rat. Males and females differed in the relationship between social class and social pressure and thus in the behavioural and pathophysiological effects of social pressure. Differences in the relationship both between and within sexes can be interpreted in terms of the degree of frustration of different social strategies. The effect of social pressure on behaviour was most obvious in time spent sleeping, exploring and attempts to escape: dominant individuals slept more and low status individuals, especially females, spent more time moving around the enclosure and stretching up the walls. Individual and sex differences in social strategy and time budgeting were reflected in levels of hormone and antibody concentrations during the period of grouping, and in changes in organ histology suggestive of early pathology. Corticosterone (but not testosterone) concentrations correlated significantly with aggressive behaviour, but with aggression subsequent to, rather than preceding or concurrent with, blood samples. Individual differences in aggression initiated and received during introductions did not reflect those recorded in established groups of either sex. The results are discussed in the light of other studies of relationships between social strategy and pathophysiology in rats and the selection pressures likely to be.

175 NAL Call No.: QL55.F43-1993

Housing of mice in an enriched environment.

Scharmann, W. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 335-337.*

Poster presentation at the symposium.

Descriptors: mice; cages; fearfulness; nesting; animal-welfare

176 NAL Call No.: QL55.I5

Housing, production and life-maintenance of the Non-Obese Diabetic (NOD) mouse.

Mansfield, K. J.; Beales, P. E.; Williams, A. J. K.; Lampeter, E. F.; Pozzilli, P. *Anim-Tech-J-Inst-Anim-Tech* v.43(1): p.29-37. (1992 Apr.)

Includes references.

Descriptors: mice; laboratory-rearing; strains

Abstract: In this paper we outline the history, maintenance, production and characteristics of a colony of Non-Obese Diabetic (NOD) mice which has been established at The Medical College of St. Bartholomew's Hospital, London. This strain of mice spontaneously develops a form of insulin dependent diabetes which closely resembles that found in humans. The problems of maintaining a colony in which this disease occurs are discussed.

177 NAL Call No.: SF459.R3H6

How to choose a cage for your pet rats.

Universities Federation for Animal Welfare. Hamilton Close [England] : Universities Federation for Animal Welfare, [1990] [4] p., Cover title.

Descriptors: Rats-as-pets; Rats-Housing

178 NAL Call No.: SF453.8.H6

How to choose or design a hutch for your pet rabbits or guinea pigs.

Universities Federation for Animal Welfare. South Mimms, Potters Bar, Herts, Eng : The Federation, 1990. 1 v. (unpaged) : ill., Cover title.

Descriptors: Rabbits-Housing; Guinea-pigs-Housing; Rabbit-hutches

179 NAL Call No.: HV4761.A5

Humane care of laboratory rats.

Ducommun, D. *AWI-q* v.42(4): p.14. (1993 Fall)

Descriptors: rats; animal-welfare; animal-husbandry

180 NAL Call No.: 410.9-P94

Husbandry factors and the prevalence of age-related amyloidosis in mice.

Lipman, R. D.; Gaillard, E. T.; Harrison, D. E.; Bronson, R. T. *Lab-anim-sci* v.43(5): p.439-444. (1993 Oct.)

Includes references.

Descriptors: mice; amyloidosis

Abstract: A retrospective study of the prevalence of amyloidosis in mice from several facilities was done. Amyloid deposition is an age-related lesion. The influence of common laboratory factors on the occurrence of this lesion was analyzed. This study documented genotypic difference in susceptibility to amyloidosis and showed that caging and pathogen status both impact on the number of cases of amyloidosis seen in a population. The lowest percentage of affected mice was seen when the animals were individually caged in a specific pathogen-free facility where conditions of stress were minimized.

181 NAL Call No.: QL55.I5

Husbandry procedures and health problems associated with a long-term mouse study.

Robbins, L.; Ellender, M. *Anim-technol* v.44(3): p.247-255. (1993 Dec.)

Includes references.

Descriptors: mice; animal-husbandry; long-term-experiments; plutonium; americium; uranium; radionuclides; toxicity; sarcoma; leukemia; osteosarcoma

Abstract: In most breeding colonies mice are usually sacrificed at approximately 8 months of age. In the majority of experimental studies on the biokinetics of radionuclides, mice are killed before they are 18 months of age. For this toxicity study comparing the effects of incorporated radionuclides it was important that the CBA/H strain mice were kept for their full lifespan of approximately three years. Treatment, age and strain related problems are reported here.

182 NAL Call No.: QP251.A1T5

Hyaluronic acid as a substitute for proteins in the deep-freezing of embryos from mice and sheep: an in vitro investigation.

Joly, T.; Nibart, M.; Thibier, M. *Theriogenology* v.37(2): p.473-480. (1992 Feb.)

Includes references.

Descriptors: sheep; mice; morula; embryo-transfer; frozen-storage; bovine-serum-albumin; hyaluronic-acid; in-vitro; embryo-culture; disease- prevention; embryo-mortality; blastocyst

Abstract: The aim of the present study was to investigate the ability of frozen-thawed mouse and sheep embryos to develop in vitro after introducing hyaluronic acid (HA) into the freezing medium as a substitute for biological proteins. A total of 443 mouse embryos and 120 sheep embryos were divided into equal numbers to be frozen in one of two freezing media containing either 4 mg/ml BSA (control) or 1 mg/ml HA (treated). Overall, 80% of the mouse embryos developed after thawing, with no significant difference ($P > 0.05$) between the two freezing media. Similarly, 75% of the frozen-thawed sheep embryos developed in culture after thawing, with no differences ($P > 0.05$) between the two groups. It was concluded that although the handling of embryos is more difficult with the HA compound than with BSA, the HA compound may be safely substituted for BSA for international movement of embryos, if these preliminary results are confirmed in vivo.

183 NAL Call No.: 410.9-P94

Hyperkeratosis is athymic nude mice caused by a coryneform bacterium: microbiology, transmission, clinical signs, and pathology.

Clifford, C. B.; Walton, B. J.; Reed, T. H.; Coyle, M. B.; White, W. J.; Amyx, H. L. *Lab-anim-sci* v.45(2): p.131-139. (1995 Apr.)

Includes references.

Descriptors: mice; hyperkeratosis; histopathology; corynebacterium; microbial-contamination; mechanical-transmission; fatty-acids; drug-resistance; skin; susceptibility; strain-differences; carrier-state; cages; immune-competence

Abstract: The purpose of this study was to characterize a spontaneous disease condition causing hyperkeratosis in nude mice and to explore the etiologic role of a particular species of coryneform bacteria in this disease, colloquially known as "scaly

skin disease." The study was divided into two parts. In the first phase, a series of inoculation experiments was conducted with a field isolate of the coryneform species used to study the clinical and histopathologic development of the disease syndrome. Athymic nude mice (4 to 5 weeks old) were inoculated on the skin of the back with a suspension of a pure culture of the coryneform bacterium that had been isolated from a field case. The culture was applied with a sterile cotton swab in concentrations varying from 6.1×10^4 /ml to 5.0×10^7 /ml. All inoculated mice became persistently infected throughout the 33 days of the experiment. Clinically evident hyperkeratosis in inoculated animals developed more frequently in mice housed in a microisolator cage than in a semi-rigid isolator and more frequently in mice inoculated with higher numbers of organisms. In all animals in which hyperkeratosis developed, it was first noted on day 7 after inoculation. The second series of experiments was designed to determine the success of various housing methods in excluding the infection, mechanisms of transmission, susceptibility of other stocks and strains of mice to the organism, and whether the other strains might serve as a source of the organism. Results of the study in various strains indicated that both immunocompetent and immunodeficient mice, whether glabrous or hirsute, could be infected with the organism, but only glabrous animals developed hyperkeratosis. buccal cultures were effective in demonstrating the organism. Histologically, lesions were similar in spontaneous cases, in the inoculation studies, and in the transmission experiments. Histopathologic changes were characterized by marked acanthosis, moderate hyperkeratosis, and a scant mononuclear cell infiltrate. Gram staining demonstrated numerous gram-positive bacteria in the stratum corneum and occasionally in hair follicles. The acanthosis persisted after hyperkeratosis was no longer grossly evident. The bacteria were often arranged in palisading or irregularly branching angular arrays similar to those of *Corynebacterium* spp. Analysis of the organism disclosed a biochemical and fatty acid profile consistent with the genus *Corynebacterium* but distinct from other *Corynebacterium* spp. The descriptive term hyperkeratosis-associated coryneform (HAC) suggested for the organism. Present studies confirm HAC as a cause of bacterial hyperkeratosis in nude mice and suggest that fomites and asymptomatic carriers, including immunocompetent hirsute mice, may serve as a source of HAC infection in the laboratory animal environment.

184 NAL Call No.: 447.8-Am3

Hypothalamic NPY and prepro-NPY mRNA in Djungarian hamsters: effects of food deprivation and photoperiod.

Mercer, J. G.; Lawrence, C. B.; Beck, B.; Burlet, A.; Atkinson, T.; Barrett, P. *Am-j-physiol* v.269(5,pt.2): p.R1099-R1106. (1995 Nov.)

Includes references.

Descriptors: food-deprivation; photoperiod; neuropeptides; corticoliberin; messenger-rna; gene-expression; hypothalamus; hamsters; neuropeptide-y; hypothalamic-arcuate-nucleus; hypothalamic-paraventricular-nucleus

Abstract: Two catabolic states leading to loss of body weight were compared in the Djungarian hamster (*Phodopus sungorus campbelli*). Hypothalamic neuropeptide Y (NPY) and gene expression for NPY and corticotropin-releasing factor (CRF) were examined after withdrawal of food for 48 h or exposure to short photoperiod for 10 or 20 wk. Food deprivation was accompanied by increases in both NPY and prepro-NPY mRNA in the hypothalamic arcuate nucleus (ARC). Increases in gene expression were limited compared with published data from the rat and were inversely related to predeprivation body weight. Exposure to short photoperiod for 20 wk reduced body weight by 39%, but the activity of the NPY-ergic system was not affected; peptide concentration and gene expression were similar in short photoperiod hamsters and long photoperiod controls. The hypothalamic NPY-ergic system of the Djungarian hamster is sensitive to weight loss due to imposed manipulations of energy balance, but the catabolism observed in short photoperiod gives rise to a body weight that is appropriate to the season encoded by the photoperiod. CRF gene expression was not affected by food deprivation or short photoperiod.

185 NAL Call No.: QD415.A1I5

Immobilization stress-induced antioxidant defense changes in rat plasma: effect of treatment with reduced glutathione.

Liu, J.; Wang, X.; Mori, A. *Int-j-biochem* v.26(4): p.511-517. (1994 Apr.)

Includes references.

Descriptors: glutathione; antioxidants; ascorbic-acid; superoxide-dismutase; iron-binding-capacity; blood-plasma; stomach; hemorrhage; stress; rats

Abstract: We examined immobilization stress-induced antioxidant defense changes in rat plasma and observed the antioxidant effect of reduced glutathione (GSH) administration on these changes. Immobilization stress induced severe bleeding in the stomach and a significant increase in plasma levels of thiobarbituric acid reacts substances (TBARS).

Immobilization stress induced a significant decrease in plasma iron-binding, iron-oxidizing protections and radical scavenging activity. Plasma levels of ascorbic acid, ascorbyl radical and superoxide dismutase activity remained unchanged following immobilization stress. Treatment with GSH showed a significant protective effect on stomach bleeding, on the increase in plasma TBARS, and on the decrease of iron-binding, iron-oxidizing protection and radical scavenging activity in plasma. These results suggest that immobilization stress induces generation of reactive oxygen species and decreases the endogenous antioxidant defenses, which can be attenuated by extracellular administration of antioxidant GSH.

186 NAL Call No.: QL55.A1L3

Immunogenicity testing of diphtheria and tetanus vaccines by using isogenic mice with possible implications for potency testing.

Hendriksen, C. F. M.; Slob, W.; Gun, J. W. v. d.; Westendorp, J. H. L.; Bieman, M. d.; Hesp, A.; Zutphen, L. F. M. *Lab-anim* v.28(2): p.121-129. (1994 Apr.)

Includes references.

Descriptors: vaccines; testing; mice; inbred-strains; hybrids; crossbreds; animal-welfare; immune-response; animal-reduction

Abstract: The antitoxin response of isogenic mice (inbred strains and F1 hybrids), immunized with diphtheria and tetanus reference vaccines, was compared with the response of animals from an NIH outbred stock. The variance in antitoxin response was smaller within the groups of isogenic mice than within the group of mice from the outbred strain. The case for estimating the potency of diphtheria and tetanus vaccines by using isogenic mice is discussed. It is concluded that the general introduction of one common inbred strain or F1 hybrid selected on the basis of sensitivity would increase the comparability of data between laboratories and would enable an estimated reduction in the use of animals of about 35% or an improvement in the precision of the estimate of potency.

187 NAL Call No.: Z7994.L3A5

Improved housing of mice, rats and guinea-pigs: a contribution to the refinement of animal experiments.

Scharmann, W. *ATLA, -Altern-lab-anim* v.19(1): p.108-114. (1991 Feb.)

Paper presented at the fifth meeting of the Italian Group for the Application of Tissue Cultures in Toxicology, May 31-June 1, 1990, Milan, Italy.

Descriptors: laboratory-animals; cages; animal-welfare

Abstract: The keeping of experimental animals requires housing systems appropriate to the needs and behaviour of each species, as demanded by various supranational and national guidelines. It is questionable whether conventional housing systems for rodents such as mice, rats and guinea-pigs meet this demand. It is suggested that the housing of laboratory rodents should be improved by the use of larger and more appropriate cage types, as well as by reducing the monotony of conventional housing systems.

188 NAL Call No.: QL55.H8

Improving the housing and care of laboratory pigeons and rats.

Schmorrow, D. D.; Ulrich, R. E. *Hum-Innovations-Alternatives. Washington Grove, MD : Psychologists for the Ethical Treatment of Animals. 1991. v. 5 p. 299-305.*

Includes references.

Descriptors: pigeons; rats; cages; space-requirements; animal-husbandry; animal-health; animal-welfare

189 NAL Call No.: QL55.A1L3

The in vitro enzyme-inducing and cytotoxic properties of South African laboratory animal contact bedding and nesting materials.

Potgieter, F. J.; Torronen, R.; Wilke, P. I. *Lab-anim* v.29(2): p.163-171. (1995 Apr.)

Includes references.

Descriptors: litter; cytotoxicity; cytotoxic-compounds; cell-cultures; vermiculite; maize-cobs; wood-shavings; paper; sawdust; screening; cytochrome-p-450

Abstract: Enzyme-inducing and cytotoxic effects of South African bedding materials were investigated using a mouse hepatoma cell line, Hepa-1, cell culture system. This cell culture system is a convenient and sensitive method for the screening of bedding materials for the presence of compounds that could be potentially harmful to animals and thus the

experimental outcome. Cells were exposed to acetone extracts of the different materials or their components. Corn cobs displayed very little or no CYP1A1-inducing or cytotoxic effects, whilst vermiculite and unbleached pulp from pine and eucalyptus showed greater induction and cytotoxic properties. The latter properties were lower than those produced by the different recycled paper extracts. Pine shavings (*Pinus elliottii*) and the different wood components making up industrial sawdust expressed the highest cytotoxic and CYP1A1-inducing properties.

190 NAL Call No.: 410.9-P94

In vivo studies with an "orphan" parvovirus of mice.

Smith, A. L.; Jacoby, R. O.; Johnson, E. A.; Paturzo, F.; Bhatt, P. N. *Lab-Anim-Sci* v.43(2): p.175-182. (1993 Apr.)

Paper presented at a conference entitled "The Scid Mouse in Biomedical and Agricultural Research," August 5-7, 1992, Guelph, Canada.

Descriptors: mice; parvovirus

Abstract: A virus antigenically related to, but distinct from, minute virus of mice was assessed for infectivity in neonatal and weanling random-bred mice and was equally infectious for both age groups. The virus, designated a mouse 'orphan' parvovirus (OPV), was also localized in tissues of experimentally infected random-bred, inbred, and immunodeficient mice by in situ hybridization. Hybridization signal was seen in exocrine and endocrine pancreas, abdominal lymph nodes, mesentery, intestine, and sporadically in other tissues of Sencar, C3H, and DBA mice inoculated as infants. In adult BALB/c severe combined immunodeficient (scid) mice, signal was seen in lung, liver, spleen, lymph nodes, and intestine but not in pancreas. Transmission of OPV by Sencar mice inoculated as infants was intermittent, whereas transmission by Sencar mice inoculated as weanlings was consistent during the first 2 weeks both by direct contact and by exposure to soiled bedding. The longest duration of transmission was 6 weeks among mice inoculated as infants. The results implicate a role for urinary, fecal, and perhaps respiratory excretion of virus, depending on host genotype and route of virus exposure. They also suggest that evaluation of pancreatic and immune function during acute infection is warranted.

191 NAL Call No.: 389.8-J82

Inbred strains of rats have differential sensitivity to dietary phosphorus-induced nephrocalcinosis.

Ritskes Hoitinga, J.; Mathot, J. N. J. J.; Zutphen, L. F. M. v.; Beynen, A. C. *J-Nutr* v.122(8): p.1682-1692. (1992 Aug.)

Includes references.

Descriptors: diet; phosphorus; nephrocalcinosis; calcium; parathyrin; inbred-strains; rats

Abstract: The degree of nephrocalcinosis after increasing the dietary phosphorus concentration from 0.2 to 0.5 g/100 g was measured in weanling female rats of 10 inbred strains. Based on kidney calcium concentrations and histological kidney calcification scores, there were considerable strain differences in nephrocalcinogenesis; 86% of the strain variability in nephrocalcinosis was attributable to genetic factors. Two strains with the most extreme nephrocalcinogenic responses were retested and the strain difference was found to be reproducible. Mean plasma phosphorus concentrations after phosphorus feeding were lower in the sensitive strain than in the insensitive strain. The high phosphorus diet produced greater urinary phosphorus concentrations, with the increase being greater in the sensitive strain. The strain difference in the response of urinary phosphorus concentrations after raising dietary phosphorus level may determine the strain difference in phosphorus-induced nephrocalcinosis. After consuming the high phosphorus diet, RP rats housed in groups in solid-floored cages had significantly higher degrees of nephrocalcinosis than their counterparts housed individually in metabolism cages with wire-mesh bases.

192 NAL Call No.: aHV4701.A952

Increasing welfare of laboratory rats with the help of spatially enhanced cages.

Anzaldo, A. J.; Harrison, P. C.; Maghirang, R. G.; Gonyou, H. W. *Animal-Welf-Inf-Cent-news1* v.5(3): p.1-2, 5. (1994 Fall)

Includes references.

Descriptors: rats; animal-welfare; cages; design; space-requirements

193 NAL Call No.: QL55.A1L3

Indirect systolic and mean blood pressure determination by a new tail cuff method in spontaneously hypertensive rats.

Ikeda, K.; Nara, Y.; Yamori, Y. *Lab-Anim* v.25(1): p.26-29. (1991 Jan.)

Includes references.

Descriptors: rats; blood-pressure; measurement; tail; photoelectric-detection

Abstract: A new tail cuff method for determining systolic and mean blood pressure in rats was developed based on photoelectric detection of tail arterial blood flow and pulsatile volume oscillation. Indirect systolic and mean blood pressure measured by this method correlated well with direct systolic and mean blood pressures recorded by a transducer and polygraph after carotid artery cannulation in stroke-resistant spontaneously hypertensive rats (SHR), stroke-prone SHR and normotensive Wistar Kyoto rats. Blood pressures were sharply, and transiently raised for about 1 min when rats were picked up by an investigator to be placed in a hot box or immobilized in a restrainer for measuring blood pressure. Therefore, blood pressures should be measured at least 1 min after the rats are put in a restrainer. This new tail cuff method for measuring blood pressure provides reliable mean blood pressure readings in conscious rats.

194 NAL Call No.: QD501.M63

Individual amino acid balances in young lean and obese Zucker rats fed a cafeteria diet.

Rafecas, I.; Esteve, M.; Fernandez Lopez, J. A.; Remesar, X.; Alemany, M. *Mol-Cell-Biochem* v.121(1): p.45-58. (1993 Apr.)

Includes references.

Descriptors: dietary-protein; amino-acids; nutrient-balance; diet; food-composition; energy-content; nitrogen-balance; obesity; rats

Abstract: The amino acid composition of the diet ingested by reference and cafeteria diet-fed lean and obese Zucker rats has been analyzed from day 30 to 60 after birth. Their body protein amino acid composition was measured, as well as the urinary and faecal losses incurred during the period studied. The protein actually selected by the rats fed the cafeteria diet had essentially the same amino acid composition as the reference diet. The mean protein amino acid composition of the rat showed only small changes with breed, age or diet. Cafeteria-fed rats had a higher dietary protein digestion/absorption efficiency than reference diet-fed rats. Obese rats wasted a high proportion of dietary amino acids when given the reference diet, but not on the cafeteria diet. In all cases, the amino acids lost as such in the urine were a minimal portion of available amino acids. In addition to breed, the rates of protein accretion are deeply influenced by diet, but even more by the age--or size--of the animals: cafeteria-fed rats grew faster, to higher body protein settings, but later protein accrual decreased considerably; this is probably due to a limitation in the 'blueprint for growth' which restricts net protein deposition when a certain body size is attained. Obese rats, however, kept accruing protein with high rates throughout. Diet composition--and not protein availability or quality--induced deep changes in amino acid metabolism. Since the differences in the absolute levels of dietary protein or carbohydrate energy ingested by rats fed the reference or cafeteria diets were small, it can be assumed that high (lipid) energy elicits the changes observed in amino acid metabolism by the cafeteria diet. The effects induced in the fate of the nitrogen ingested were more related to the fractional protein energy proportion than to its absolute values. Cafeteria-fed rats tended to absorb more amino acids and preserve them more efficiently; these effects were shown even under conditions of genetic obesity. There were deep differences in handling of dietary amino acids by dietary or genetically obese rats. The former manage to extract and accrue larger proportions of their dietary amino acids than the latter. The effects of both 'models' of amino acid management were largely additive, suggesting that the mechanisms underlying the development of obesity did not run in parallel to those affecting the control of amino acid utilization. Obesity may be developed in both cases despite a completely different strategy of amino acid assimilation, accrual and utilization.

195 NAL Call No.: QP1.P4

Induction of obesity by group housing in female Syrian hamsters.

Meisel, R. L.; Hays, T. C.; Del Paine, S. N.; Luttrell, V. R. *Physiol-Behav* v.47(5): p.815-817. (1990 May)

Includes references.

Descriptors: hamsters; ovariectomized-females; obesity; group-effect; animal-housing; body-weight; body-fat; adrenals; stress-factors; social-stress

196 NAL Call No.: 410.9-P94

Infection of SDAV-immune rats with SDAV and rat coronavirus.

Weir, E. C.; Jacoby, R. O.; Paturzo, F. X.; Johnson, E. A. *Lab-Anim-Sci* v.40(4): p.363-366. (1990 July)

Includes references.

Descriptors: rats; sialodacryoadenitis-virus; coronavirus; immunity; reinfection; disease-transmission; disease-course

Abstract: Infection of rats with sialodacryoadenitis virus (SDAV) or rat coronavirus (RCV) is acute and self-limiting, and elimination and control of either virus is based on the assumption that recovered rats are immune to reinfection. To test this hypothesis, we examined whether SDAV-immune rats could be infected with RCV or reinfected with SDAV. Sprague

Dawley (SD) rats were inoculated intranasally with SDAV or with culture medium alone and serial SDAV antibody titers were obtained. Eleven months after inoculation, when antibody titers had stabilized, SDAV-immune and nonimmune rats were challenged with SDAV or RCV, and euthanized 3 or 6 days later. SDAV-immune rats challenged with SDAV or RCV manifested acute rhinitis associated with virus antigen by 3 days after inoculation, but no lesions or antigen were subsequently found in the lower respiratory tract, salivary glands or lacrimal glands. There was also a marked anamnestic increase in antibody titer by 6 days after challenge. SDAV-immune rats challenged with SDAV or RCV also transmitted infection to nonimmune cage mates. This study indicates that 11 months after primary, infection with SDAV, rats can be infected with SDAV or RCV, but that the severity of disease is significantly reduced.

197 NAL Call No.: QL55.F43-1993

Infectious myocarditis in rats.

Rozengurt, N.; Sanchez, S. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 258-261.*

Includes references.

Descriptors: rats; myocarditis; outbreaks; histopathology; serology; symptoms

198 NAL Call No.: QL55.F43-1993

Influence of a resistant starch diet on microbiological and physiological parameters in rats.

Quehl, A.; Stoof, G.; Anger, H.; Proll, J.; Richter, M.; Luder, W. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 472-474.*

Poster presentation at the symposium.

Descriptors: rats; potato-starch; fiber; bacterial-count; defecation; ileum; cecum; colon; weight; blood-serum; cholesterol; phospholipids

199 NAL Call No.: QL55.F43-1993

Influence of age and metabolic state of mothers on the life expectancy of non-diabetic offspring in diabetes-prone BB/OK rats.

Kloting, I.; Vogt, L. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 265-269.*

Includes references.

Descriptors: rats; diabetes; familial-incidence; lifespan; glucosuria; maternal-effects; sex-differences; causes-of-death; neoplasms; age-differences

200 NAL Call No.: QL55.I5

Influence of body weight on dominance and aggression in groups of male Swiss strain mice.

Bartos, L.; Brain, P. F. *Anim-technol* v.45(3): p.161-168. (1994 Dec.)

Includes references.

Descriptors: mice; body-weight; social-dominance; aggressive-behavior

Abstract: The influence of body weight on the formation of dominance hierarchies in social groups of three (Triads) or two (Couples) male mice was assessed. Individually housed mice were included for comparison. Four ten minute observations were carried out in a neutral cage. A plastic tube with a pellet of food attached firmly to the inner surface was connected to one of the shorter walls of this cage. Each of the videotaped observations was preceded by 24 hr of food deprivation. Each mouse was weighed at the start of the experiment and then before each observation session. Initial observations suggested that body weight was not a principal factor influencing dominance relationships among social mice in this experiment. However, when only mice that maintained their social status for at least the last 3 observations were considered, high body weight appeared an important determinant of social dominance. The trend in successive trials fitted the expected difference with dominant mice being heavier than subordinates. The subordinated males in such groups had more superficial wounds than counterparts in Couples, suggesting a higher level of social stress. The males in both social groups increasing their rank did not show a significant gain in body weight but those that fell in the hierarchy lost weight. The body weight of isolated mice differed from all social mice regardless of their social status. Isolates were heavier than the social mice at the start of

the experiment but their weight sharply decreased during the initial week of the experiment and by three weeks it was still lower than in social mice.

201 NAL Call No.: QL55.A1L3

The influence of buprenorphine or bupivacaine on the post-operative effects of laparotomy and bile-duct ligation in rats.

Liles, J. H.; Flecknell, P. A. *Lab-anim* v.27(4): p.374-380. (1993 Oct.)

Includes references.

Descriptors: rats; analgesics; postoperative-care

Abstract: The post-operative effects of laparotomy and common bile-duct ligation were investigated in rats. Bile-duct ligation caused a significant reduction in food and water consumption, body weight and locomotor activity in the immediate post-operative period. Animals which underwent laparotomy in which bile-duct ligation was not carried out (sham operated groups) had significantly less depression of food and water consumption and body weight than groups which underwent bile-duct ligation. The detrimental effects on food and water consumption and body weight could be significantly reduced by the administration of buprenorphine (0.05 mg/kg, s/c), but not by infiltration of the surgical wound with the long-acting local anaesthetic agent, bupivacaine. The reduction of the depressant effects of surgery on food and water consumption by the opioid analgesic buprenorphine suggests that some of these changes may be related to the presence of post-operative pain.

202 NAL Call No.: 389.8-B773

The influence of dietary fibre on body composition, visceral organ weight, digestibility and energy balance in rats housed in different thermal environments.

Zhao, X.; Jorgensen, H.; Eggum, B. O. *Br-j-nutr. Cambridge [England] : Cambridge University Press ; Chicago, Ill. : Agent for U.S.A., The University of Chicago Press, 1947-. May 1995. v. 73 (5) p. 687-699.*

Includes references.

Descriptors: fiber; body-composition; organs; weight; digestibility; energy-balance; environmental-temperature; nutrient-intake; diet; experimental- diets; nutrient-balance; body-weight; body-protein; weight-gain; body-fat; protein-digestibility; energy-digestibility; metabolizable-energy; heat- production; energy-metabolism; energy-consumption; energy-intake; rats

Abstract: The present study was undertaken to provide detailed information on the effect of dietary fibre (DF) level on body composition, visceral organ weight, nutrient digestibility and on energy and protein metabolism of rats housed in cold (16 degrees), warm (24 degrees) or hot (32 degrees) thermal environments. High- or low-fibre diets (257 v. 56 g DF/kg dry matter (DM)) were studied in a 6-week balance experiment (initial body weight about 100 g). Heat production was measured using open-air circuit respiration chambers. Pea fibre and pectin were used to adjust the DF level in the high-fibre diet. The ranking order of daily gain of rats kept in different environments was: 24 degrees > 16 degrees > 32 degrees, while the ranking order for carcass protein was: 16 degrees > 24 degrees > 32 degrees. Rats on the high-DF diet had a lower daily gain than those on the low DF diet, and more protein in DM of empty body weight (EBW) and less fat. The relative weights (g/kg EBW) of liver, heart and kidney decreased when increasing the environmental temperature. The relative weight of the heart was highest in rats on the high DF level, while liver and kidney weights were unaffected by DF. Per kg EBW, the stomach, small intestine, caecum and colon and the length of colon were significantly greater in rats consuming the high-fibre diet compared with those on the low-fibre diet. Rats kept at low temperature had a significantly heavier gastrointestinal (GI) tract than those kept at the highest temperature. Digestibility of protein, DM and energy was lowest for rats fed on the high-fibre diet. Heat production (HP) of fed rats as well as fasting HP decreased significantly as environmental temperature increased. HP. temperatures. The proportion of energy retained as protein was slightly higher in rats fed on the high-fibre than on the low-fibre diet. Based on the results of the present study the authors measured a net energy value of 5.4 kJ/g DF fermented; approximately 50% of the DF came from peas. Possible implications of the present findings are discussed.

203 NAL Call No.: TX341.P53

Influence of dietary soybean trypsin inhibitors and DL-ethionine on sulfur amino acid adequacy of diets for young rats.

Peace, R. W.; Sarwar, G.; Botting, H. G.; Touchburn, S. P. *Plant-Food-Hum-Nutr* v.42(4): p.337-349. (1992 Oct.)

Includes references.

Descriptors: diet; trypsin-inhibitors; ethionine; sulfur-amino-acids; nutritional-adequacy; rats

204 NAL Call No.: 389.8-B773**The influence of different amounts of n-3 polyunsaturated fatty acids on bleeding time and in vivo vascular reactivity.**

Mark, G.; Sanders, T. A. B. *Br-j-nutr. Cambridge [England] : Cambridge University Press ; Chicago, Ill. : Agent for U.S.A., The University of Chicago Press, 1947-. Jan 1994. v. 71 (1) p. 43-52.*

Includes references.

Descriptors: polyenoic-fatty-acids; nutrient-intake; hemostasis; fish-oils; blood-pressure; platelets; erythrocytes; docosenoic-acids; blood-coagulation; vascular-system; rats

Abstract: Mesenteric bleeding time, mesenteric vascular reactivity, platelet and erythrocyte lipid fatty acid composition were measured at 2-3 weeks, 5-6 weeks and 11-22 weeks in normotensive Wistar rats, fed on high (6.5% energy) or moderate (1.6% energy) intakes of eicosapentaenoic acid (20:5n-3; EPA) as fish oil, compared with controls fed on a diet devoid of EPA. All diets contained the same level of linoleic acid (4% energy): the moderate- and high-EPA diets also contained 1.1 and 4.4% of the energy as docosahexaenoic acid 22:6n-3) respectively. Moderate, but not high, intakes of EPA increased mesenteric bleeding time. Similar reductions in erythrocyte and platelet arachidonic acid (20 mg/kg). occurred in animals fed on either high or low amounts of EPA, but the proportion of EPA increased dose-dependently. At high intakes of EPA the proportion of oleic acid in platelets and erythrocytes was decreased. Blood pressure platelet counts, mesenteric vessel diameter and mesenteric vascular reactivity to vasopressin were unaffected by treatment. High intakes of fish oil led to a slight fall in packed cell volume. In a second experiment bleeding time and mesenteric vascular reactivity to noradrenaline were increased 2-4 weeks after receiving a moderate intake of EPA and these effects persisted 5-21 d after switching to a control diet. A similar increase in vascular reactivity to noradrenaline was observed in animals given indomethacin (6 mg/kg) but not in those given aspirin (20 mg/kg).

205 NAL Call No.: QP141.A1J68**Influence of exercise on linear growth.**

Torun, B.; Viteri, F. E. *Eur-j-clin-nutr* v.48(suppl.1): p.S186-S190. (1994 Feb.)

Paper presented at an I.D.E.C.G. workshop on Causes and Mechanisms of Linear Growth Retardation, January 15-18, 1993, London.

Descriptors: growth-rate; exercise; nutrient-intake; bone-formation; protein-energy-malnutrition; rats; children

Abstract: The effects of exercise on linear growth were investigated in malnourished rats and in preschool children recovering from protein-energy malnutrition (PEM). Physical activity was either restricted or forced upon weanling rats that were pair-fed with 73 or 49% of the food eaten ad libitum by rats of the same age. Physically active animals grew more in length and weight than their inactive counterparts. In a subsequent study, 20 children, 24-48 months old, under treatment for severe PEM, were assigned to either an Active group (stimulated, but not forced, to participate in games and activities that involved walking uphill, climbing a ramp, running, tumbling and climbing stairs) or a Control group (with the ad libitum pattern of physical activity and rest commonly observed in child-care and nutrition rehabilitation centers). Dietary intake was controlled and almost identical in both groups (2.5 +/- 0.07 g protein and 117 +/- 7 kcal/kg/day). Mean energy expenditure during daytime, assessed by heart rate monitoring and its relationship with oxygen consumption, were 2.0 and 1.7 times basal metabolic rate in the Active and Control groups, respectively (P < 0.01). In 6 weeks, both groups gained an average of 1.98 kg. However, the Active group grew more in length (22 +/- 8 vs 14 +/- 6 mm, P < 0.05) and lean body mass (final creatinine-height index: 0.97 +/- 0.12 vs 0.89 +/- 0.09, P < 0.05). The inactivity that accompanies severe malnutrition may contribute to stunting, whereas mild-to-moderate exercise combined with a good diet enhances linear growth. This may be mediated by endocrine growth factors, whose synthesis is prompted by exercise.

206 NAL Call No.: QP141.A1N88**Influence of nitrogen balance and intestinal glucose absorption on growth of rats recovery from early undernutrition.**

Gutierrez, J. M.; Alvarez, D.; Diaz, F.; Fernandez, S.; Menendez Patterson, A. *Nutr-Res* v.11(12): p.1427-1437. (1991 Dec.)

Includes references.

Descriptors: young-animals; malnutrition; compensatory-growth; nitrogen-balance; intestinal-absorption; glucose; rats

Abstract: The present work analyses the role of food and water intake, nitrogen balance, "in vivo" D-glucose intestinal absorption and plasma insulin level in body weight gain by early malnourished male rats after two or four months of rehabilitation with normal diet. Malnutrition was applied "in utero" and during the lactation period by reducing normal diet. At 3 and 5 months of age, the animals remained in metabolic cages during ten days, were then anaesthetized, and the plasma

insulin level and "in vivo" D-glucose intestinal absorption were measured. Comparison of the ratio of weight gained to the amount of food consumed demonstrates a greater food efficiency in the malnourished animals at 3 months of age, which is explained by the increased nitrogen balance measured by 100 g of body weight. The evolution of body weight gain in the control and malnourished animals was similar at 5 months of age. If we compare the results at 3 and 5 months of age, the data suggests that early malnutrition can act by retarding age-associated physiological changes such as intestinal and pancreatic processes.

207 NAL Call No.: 410-B77

The influence of nutrition and postpartum mating on weaning and subsequent play behaviour of hooded rats.

Smith, E. F. S. *Anim-Behav* v.41(pt.3): p.513-524. (1991 Mar.)

Includes references.

Descriptors: rats; play; animal-behavior; animal-nutrition; pregnancy; weaning; restricted-feeding; unrestricted-feeding

Abstract: Female hooded rats, *Rattus norvegicus*, that were mildly food restricted or pregnant during lactation weaned their offspring earlier than ad libitum fed control mothers. Early weaning was inferred by lower rates of milk transfer, an earlier reduction in care-giving activities and increased unwillingness to suckle pups. However, food-restricted and pregnant mothers differed in how they weaned their offspring. Most notably, pregnant dams became highly aggressive to their pups around this time. After weaning was completed, levels of play in both groups of early weaned pups were higher than those of control pups. Thus the discovery of a relationship between early weaning and increased play, previously reported in domestic cats, *Felis catus*, generalizes to a second altricial species. Since details of the increased play response varied between the litters of food-restricted and pregnant mothers, the former engaging in more social play and locomotor play, and the latter only in more locomotor play, this difference was attributed to the nature of the weaning process that rat pups experienced earlier.

208 NAL Call No.: QL785.A725

Inhibition of exploratory behavior in the rat by handling.

Ambrogi Lorenzini, C.; Bucherelli, C.; Giachetti, A.; Tassoni, G. *Anim-Learn-Behav* v.18(2): p.191-198. (1990 May)

Includes references.

Descriptors: rats; handling; animal-behavior; inhibition; exploration

Abstract: The effect of tail-handling on exploratory behavior of the rat, measured as step-through latency in a well-lighted, two-box apparatus, was investigated. Male adult Wistar rats, aged 60 days, were employed in all three experiments. Experiment 1, in which the subjects were handled at different times after entering the goal chamber (0, 10, 30, 60, 300, and 600 sec), showed that immediate handling, relative to detention in the goal chamber (delay of handling) had an inhibitory effect on exploration. Experiment 2 showed that groups handled immediately after entering the goal chamber but then detained there for different durations all showed the same progressive inhibition of exploration. Experiment 3 showed that the inhibition of exploration (very long step-through latencies) due to tail-handling immediately after entering the goal chamber could be significantly decreased by further trials in which handling was delayed for a sufficient duration (30 sec or more). Handling is discussed as a stimulus that is aversive enough to elicit conditioned passive-avoidance responses (inhibition of exploratory behavior), although it is subject to rapid extinction.

209 NAL Call No.: QL55.A1L3

Inter-colony variation in fluid balance and its relationship to vasopressin secretion in male Sprague-Dawley rats.

Wells, T.; Windle, R. J.; Peysner, K.; Forsling, M. L. *Lab-anim* v.27(1): p.40-46. (1993 Jan.)

Includes references.

Descriptors: rats; strain-differences

Abstract: Salt and water balance and vasopressin secretion were measured in three colonies of Sprague-Dawley rats. Although sodium and water retention were similar between the groups, there were marked differences in both the rate and diurnal pattern of intake and excretion. Animals housed under semi-barrier conditions showed a lower basal plasma vasopressin concentration but were more sensitive to physiological stimuli. However, since pathogenic status and environmental conditions cannot entirely explain these results, genetic variation is likely to be a contributory factor.

210 NAL Call No.: 447.8-AM3

The interactive effects of dietary sodium chloride and calcium on cardiovascular stress responses.

Scrogin, K. E.; Hatton, D. C.; McCarron, D. A. *Am-J-Physiol* v.261(4,pt.2): p.R945-R949. (1991 Oct.)

Includes references.

Descriptors: calcium; sodium-chloride; dietary-minerals; blood-pressure; hypertension; stress; norepinephrine; epinephrine; rats; sympathoadrenal-activity

Abstract: Blood pressure increases associated with salt loading in the spontaneously hypertensive rat (SHR) are attenuated with increased dietary calcium. To assess the cardiovascular effects of these nutrients during stress, blood pressure and sympathoadrenal responses to stress were compared in salt-sensitive SHRs fed diets containing normal (0.73%) or high (8.0%) NaCl combined with either low (0.2%) or high (2.0%) calcium. NaCl-loaded rats showed increased blood pressure and exaggerated plasma epinephrine changes during restraint stress. Elevated blood pressure responses to exogenous NE were also observed with high salt intake. Supplementary calcium reduced blood pressure and attenuated the hypertensive effect of NaCl during restraint stress. Animals fed the high calcium diets had lower plasma epinephrine levels while vascular reactivity was not affected. The results indicate that increased sympathoadrenal activity and vascular reactivity contribute to elevated blood pressure and exaggerated pressor responses produced by NaCl loading in the salt-sensitive SHR. However, the hypotensive effects of dietary calcium appear to be related to sympathoadrenal activity but not vascular reactivity.

211 NAL Call No.: 447.8-Am3

Interactive effects of food deprivation and exercise on reproductive function in female hamsters.

Powers, J. B.; Jetton, A. E.; Wade, G. N. *Am-j-physiol* v.267(1,pt.2): p.R185-R190. (1994 July)

Includes references.

Descriptors: food-deprivation; exercise; ovulation; estrous-cycle; lordosis; reproductive-behavior; hamsters; females; estrous-behavior

Abstract: Two experiments evaluated the combined effects of food deprivation and runningwheel access on estrous cycles and estrous behavior of female hamsters. In experiment 1, food deprivation on days 1 and 2 of the estrous cycle disrupted the next expected ovulation, and this effect was more, rather than less, robust in females allowed to exercise in running wheels while they were deprived. In experiment 2, a similar protocol was used except the females were ovariectomized and received sequential injections of estradiol benzoate (EB; 5 micrograms) and progesterone (P; 200 micrograms) separated by 48 h to induce lordosis, which was tested 4-5 h after P. Food deprivation concomitant with hormonal treatment diminished lordosis durations, but this effect was significant only among the females that were permitted to run in activity wheels. Previous findings demonstrated that access to running wheels attenuated the inhibitory effects of short photoperiod exposure on hamster estrous cycles. In contrast, the present results indicate that this same manipulation exaggerates rather than diminishes the inhibitory effects of food deprivation on estrous cycles and hormone-induced behavioral estrus.

212 NAL Call No.: 410.9-P94

Interference by bedding materials in animal test system involving ascorbic acid depletion.

Dunham, W. B.; Young, M.; Tsao, C. S. *Lab-anim-sci* v.44(3): p.283-285. (1994 June)

Includes references.

Descriptors: guinea-pigs; ascorbic-acid; litter; wood-chips; paper; animal-experiments

213 NAL Call No.: QP351.B45

Interoceptive sensory signals produced by 24-hr food deprivation, pharmacological glucoprivation, and lipoprivation.

Benoit, S. C.; Davidson, T. L. *Behav-neurosci* v.110(1): p.168-180. (1996 Feb.)

Includes references.

Descriptors: food-deprivation; 2-deoxy-d-glucose; metabolic-inhibitors; lipid-metabolism; glucose; energy-metabolism; senses; feeding-behavior; rats; na-2-mercaptoacetate; glucose-metabolism; sensory-cues

214 NAL Call No.: 389.8-J82

Intestinal amino acid transport in mice is modulated by diabetes and diet.

Casirola, D. M.; Vinnakota, R. R.; Ferraris, R. P. *J-nutr* v.124(6): p.842-852. (1994 June)

Includes references.

Descriptors: amino-acids; nutrient-transport; nutrient-uptake; diet; diabetes; dietary-protein; regulation; enzyme-activity; intestinal-absorption; mice

Abstract: Diet is the cornerstone of diabetes management, but nutritional interventions in diabetes are still being developed; hence, it is important to understand the effects of diet on nutrient metabolism. Dietary sugars stimulate intestinal sugar absorption in diabetic mice, but the effect of dietary protein on amino acid absorption in diabetes is unknown. We fed streptozotocin-diabetic (>60 d diabetic) and nondiabetic mice high protein (70% casein) or low protein (15% casein) diets designed to elicit adaptation in amino acid uptake by the small intestine. A high protein diet significantly enhanced uptake per milligram of small intestine of the nonessential amino acids proline and aspartate in both diabetic and nondiabetic mice. Uptake per milligram of small intestine of the essential amino acids leucine and lysine and of the nonessential amino acid alanine which shares transporters with essential amino acids was independent of dietary protein. There was no effect of diabetes on uptake per milligram of any amino acid studied. Because weight per centimeter was greater in diabetic mice, uptake per centimeter of all amino acids tended to be greater in diabetics. Specific activity of alkaline phosphatase in the proximal and distal jejunum was independent of diabetes but varied with dietary protein. Changes in levels of dietary protein induce reversible adaptation of the intestinal uptake rate of nonessential but not of essential amino acids, an adaptive pattern typical of nondiabetics and apparently maintained in diabetics as well.

215 NAL Call No.: QL55.A1L3

Intestinal parasites of conventionally maintained BALB/c mice and *Mastomys coucha* and the effects of a concomitant schistosome infection.

Higgins Opitz, S. B.; Dettman, C. D.; Dingle, C. E.; Anderson, C. B.; Becker, P. J. *Lab-anim* v.24(3): p.246-252. (1990 July)
Includes references.

Descriptors: mice; praomys; schistosoma-mansonii; nematoda; protozoa

Abstract: A longitudinal study was carried out to identify the spectrum of intestinal parasites present in conventionally maintained BALB/c mice and *Mastomys coucha* and to determine the effects of concomitant schistosome infections on their parasite status. Six parasites were observed during the course of the study, namely the nematodes *Aspicularis tetraptera* and *Syphacia obvelata*, *Entamoeba muris* and the flagellates *Trichomonas muris*, *Spironucleus muris* and *Chilomastix* spp. Although the 2 rodents shared common facilities, the overall prevalences of *S. obvelata*, *T. muris* and *S. muris* were significantly higher in *M. coucha* than BALB/c mice. BALB/c mice with concomitant schistosome infection had increased prevalences of *E. muris*, *T. muris* and *S. muris*. In *M. coucha*, in contrast, there were no significant increases in parasite prevalences. Infection intensities of *T. muris* and *S. muris* were significantly greater in *M. coucha* than BALB/c mice. Concomitant schistosome infection resulted in increased intensities of *T. muris* infection in BALB/c mice only. The influence of immune status in determining the susceptibilities of rodents to environmentally transmitted parasites is discussed.

216 NAL Call No.: RC628.A1O2

The involvement of the sympathetic nervous system in meal-induced thermogenesis in mice.

Griggio, M. A.; Richard, D.; Leblanc, J. *Int-J-Obesity* v.15(11): p.711-715. (1991 Nov.)

Includes references.

Descriptors: food-intake; adipose-tissue; sympathetic-nervous-system; heat-production; heart; feeding-frequency; mice; brown-adipose-tissue

Abstract: The acute effect of food intake on the activity of the sympathetic nervous system (SNS) in both heart and brown adipose tissue (BAT) was investigated in mice. Upon delivery to the laboratory mice were housed singly and divided into two groups. Half the mice were accustomed to eat their daily food ration in two meals whereas the other half were given continuous access to food. SNS activity in both heart and BAT was estimated by measuring the accumulation of dopamine (DA) after having blocked the transformation of dopamine into noradrenaline (NA) with 1-cyclohexyl-2-mercaptoimidazole (CHMI). CHMI inhibits the enzyme dopamine beta-hydroxylase. On the day SNS activity was assessed, continuously fed (CF) or meal-fed (MF) mice were injected with either saline or CHMI one hour before being killed. In order to assess the anticipatory effects of being fed, a group of mice already accustomed to the meal-feeding schedule were not allowed to eat after the injections. Additional CF and MF mice were killed without being injected in order to determine the basal levels of both DA and NA. The results show that the accumulation of DA in both heart and BAT was higher in MF than CF mice regardless of whether MF mice were or were not fed after the injection of CHMI. It therefore appears that the intake of food may increase SNS activity in various tissues in mice, and that such a response may be largely of cephalic origin.

217 NAL Call No.: QL55.F43-1993

Iron metabolism in a rat model with marginal vitamin A deficiency as compared with iron deficiency.

Roodenburg, A. J. C.; West, C. E.; Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 448-450.*

Poster presentation at the symposium.

Descriptors: rats; mineral-metabolism; iron; vitamin-a-deficiency; mineral-deficiencies; retinol; iron-deficiency-anemia; nutritional-anemia

218 NAL Call No.: 410.9-P94

Isolation-induced renal functional changes in rats from four breeders.

Vadiei, K.; Berens, K. L.; Luke, D. R. *Lab-Anim-Sci* v.40(1): p.56-59. (1990 Jan.)

Includes references.

Descriptors: rats; strains; strain-differences; renal-function; isolation

Abstract: The investigation of drug-induced nephrotoxicity depends on the adequate estimation of renal function at baseline and upon completion of the study. Typically, this procedure requires housing of the animal in an individual wire-bottom metabolic cage to facilitate complete urine collection. The present study compared the effects of 4 consecutive days of isolation on Sprague-Dawley rats from four breeders: Harlan Sprague-Dawley, Charles River Laboratories, BioLab and TIMCO Breeders. Following 4 days of isolation, weight loss was not significantly different between groups. However, urine flow rate declined significantly ($p < 0.0005$) in TIMCO and Charles River breeder rat groups during the study period compared to baseline values and other groups. Serum creatinine levels were 63% greater ($p < 0.01$) with a 40% decline in creatinine clearance ($p < 0.0001$) after 4 days of isolation in TIMCO rats. Although a 59% decrease in baseline creatinine clearance was found in Charles River rats after 96 hours of isolation ($p < 0.0005$), the mean baseline value was 38% greater than other rat groups ($p = 0.04$). Fractional reabsorption of sodium was 4.4% less ($p < 0.001$) in TIMCO rats compared to baseline. Fractional excretion of potassium was highly variable in all rat groups. We conclude that animal isolation was associated with a significant change in renal function in TIMCO rats which was not observed in others. Caution is required to consider the source of the rat, and also duration of isolation, in studies requiring the passive assessment of renal function.

219 NAL Call No.: QL55.A1L3

Isolation of Acinetobacter calcoaceticus from the gastrointestinal tracts of SCID mice.

Ohsugi, T.; Shimoda, K.; Maejima, K.; Kagiya, N.; Takagi, H.; Nomura, T. *Lab-anim* v.27(3): p.226-228. (1993 July)

Corrects AGRICOLA accession no. 20354821 in which subject category codes and tag 910 were inadvertently left off.

Descriptors: mice; acinetobacter-calcoaceticus

Abstract: Abstract: Acinetobacter calcoaceticus colonization was observed in the gastrointestinal tracts of C.-B17-scid/scid (SCID) mice, while it was not observed C.B17-scid/ + and C.B17- +/- mice with normal immunity housed under the same conditions. A. calcoaceticus and other viable enteric bacteria were not isolated from any organs other than gastrointestinal tract in SCID mice. The mice colonized with this organism were apparently healthy and no significant visceral lesion was observed.

220 NAL Call No.: 410.9-P94

Ivermectin eradication of pinworms from rats kept in ventilated cages.

Huerkamp, M. J. *Lab-Anim-Sci* v.43(1): p.86-90. (1993 Feb.)

Includes references.

Descriptors: rats; ivermectin; syphacia; syphacia-muris

Abstract: Studies using rats that were naturally infested with Syphacia muris and kept in forced-air, individually ventilated cages showed that ivermectin given orally at a dose of 2 mg/kg for three treatments at 7- or 9-day intervals was eradicated. Paired ivermectin treatments given at 7- or 9-day intervals were ineffective in eliminating parasitism. Pinworm eggs persisted on the perianal region of rats for up to 17 days and eggs were also present in soiled contact bedding within cages and on surfaces within the animal room. Anal tapes as a diagnostic test had 88% sensitivity in detecting pinworms.

221 NAL Call No.: HV4761.A5

Judge rules against exclusion of lab mice, rats and birds from humane treatment.

Anim-Welfare-Inst-Q v.41(1): p.10. (1992 Winter)

Descriptors: laboratory-animals; animal-welfare

222 NAL Call No.: 472-N42**The laboratory rat's guide to Europe.**

MacKenzie, D. *New-Sci* v.134(1821): p.29-31. (1992 May)

Descriptors: animal-experiments; regulations; animal-welfare; european-communities; animal-testing-alternatives; europe; european-centre-for-the-validation-of-alternative-methods-cevma

223 NAL Call No.: S601.A34**Land use patterns and types of common vole (*Microtus arvalis*) population kinetics.**

Delattre, P.; Giraudoux, P.; Baudry, J.; Musard, P.; Toussaint, M.; Truchetet, D.; Stahl, P.; Poule, M. L.; Artois, M.; Damange, J. P. *Agric-Ecosyst-Environ* v.39(3/4): p.153-169. (1992 Apr.)

Includes references.

Descriptors: microtus-arvalis; population-ecology; population-density; population-dynamics; seasonal-abundance; cyclic-fluctuations; seasonal-fluctuations; mustela-nivalis; predator-prey-relationships; predation; land-types; land-use; land-management; grasslands; farmland; vertebrate-pests; biological-control; france; population-fluctuations; pluriannual

224 NAL Call No.: QP1.P4**Lasting effects of early chronic caffeine feeding on rats' behavior and brain in later life.**

Nakamoto, T.; Roy, G.; Gottschalk, S. B.; Yazdani, M.; Rossowska, M. *Physiol-Behav* v.49(4): p.721-727. (1991 Apr.)

Includes references.

Descriptors: caffeine; pregnancy; lactation; growth; activity; animal-behavior; maternal-effects; newborn-animals; brain; rats; locomotive-activity

Abstract: Pregnant dams were fed a 20% protein diet with caffeine (2 mg/100 g b.wt.), starting on day 9 of gestation. At birth, each dam with 8 assigned pups was fed this diet until weaning, day 22. On day 22, female rats were caged and fed this diet until day 93. Starting on day 93, the caffeine-supplemented diet was replaced with a caffeine-free, 20% protein diet until day 388. Starting on day 31, each animal was placed in a photoactivity cage, and locomotive activity was measured until day 375. On day 388, the animals were killed, and their brains were removed and divided into 7 regions. The weight, DNA, protein and zinc contents, and alkaline phosphatase activity of each region were determined. Locomotive activity of the caffeine-fed group was higher than in the noncaffeine control group. Accumulative activity scores showed 3 subgroups (high, medium, and low) in both groups at day 93. The medium activity subgroup in the caffeine group was greater than the controls from day 72 to day 93. These differences reappeared 5 weeks after cessation of caffeine supplementation and continued until day 375. The differences in activity were minimum in the high and low subgroups. Chronic caffeine intake in early life permanently affected the medium activity subgroup. Furthermore, various regions of the brain were biochemically altered in spite of the feeding of a noncaffeine diet for almost 300 days after caffeine.

225 NAL Call No.: 447.8-Am3**Lateral hypothalamic NMDA receptors and glutamate as physiological mediators of eating and weight control.**

Stanley, B. G.; Willett, V. L. I.; Donias, H. W.; Dee, M. G. II.; Duva, M. A. *Am-j-physiol* v.270(2,pt.2): p.R443-R449. (1996 Feb.)

Includes references.

Descriptors: eating; food-intake; feeding-behavior; suppression; glutamic-acid; aspartic-acid; receptors; antagonists; agonists; nocturnal-activity; food-deprivation; body-weight; liveweight-gain; hypothalamus; rats; n-methyl-d-aspartate-receptors; d---2-amino-5-phosphonopentanoic-acid; kainic-acid; d,l-alpha-amino-3-hydroxy-5-methylisoxazole

Abstract: To determine whether endogenous lateral hypothalamic (LH) glutamate and its N-methyl-D-aspartate (NMDA) receptors might participate in the stimulation of natural eating, LH injection of the NMDA antagonist D-(-)-2-amino-5-phosphonopentanoic acid (D-AP5) was tested in adult male rats for suppressive actions on feeding elicited by 1) NMDA, kainic acid, or D,L-alpha-amino-3-hydroxy-5-methylisoxazole (AMPA) injected into the LH; 2) food deprivation; and 3) the onset of the nocturnal period. D-AP5 (10-100 nmol) reduced by 72-90% the approximately 10-g eating response elicited by NMDA (10 nmol) without affecting the quantitatively similar eating responses elicited by kainic acid (1.0 nmol) or AMPA (1.0 nmol). This treatment also suppressed deprivation-induced eating by as much as 61% and nocturnal eating by as much as 40%. To determine its long-term effects, D-AP5 (50 nmol) was injected bilaterally into the LH twice a day for 8 consecutive days. This treatment caused up to 65% reductions in daily food intake and body weight loss of up to 13 g/day. These findings, showing behaviorally selective suppressions of eating and body weight by D-AP5, argue that endogenous LH glutamate acts to regulate natural eating and body weight and that NMDA receptors participate in these functions.

226 NAL Call No.: QL876.B5**Life-long moderate caloric restriction prolongs reproductive life span in rats without interrupting estrous cyclicity: effects on the gonadotropin-releasing hormone/luteinizing hormone axis.**

McShane, T. M.; Wise, P. M. *Biol-reprod* v.54(1): p.70-75. (1996 Jan.)

Includes references.

Descriptors: rats; food-restriction; calorie-restricted-diets; estrous-cycle; persistence; lh; hormone-secretion; aging; longevity; prolonged-cyclicity; reproductive-longevity

Abstract: Restricting food intake to 60% that of ad libitum-fed rats results in an extended life span, reduced incidence of age-related diseases, and delayed reproductive senescence. We used this animal model to further elucidate the mechanisms whereby reproductive senescence is delayed. Female Sprague-Dawley rats (7 wk old) were calorically restricted (CR; n = 70) to 60% of the ad libitum (AL) intake measured in control rats (n = 70). Rats were individually housed under a 14L:10D cycle and fed daily within 1.5 h of lights-off. Body weights were monitored every 2 wk, and vaginal lavage was performed until rats were ovariectomized (OVX). Two weeks after OVX, when rats were 4, 12, or 18 mo of age, blood samples were taken via jugular cannulae every 6 min for 3 h, and the plasma was assayed for rat LH. The resulting profiles were examined through use of Cluster analysis for mean LH concentrations, LH pulse amplitude, and interval between LH pulses. CR rats grew at a slower rate, and then maintained body weights at approximately 76% that of AL controls between 4 and 17.5 mo of age. The onset of persistent estrus was delayed by 4 mo in CR rats. Average cycle length was longer ($p < 0.01$) by less than 0.5 days in CR compared with AL rats between 3.5 and 5.5 mo of age but not different between 6.5 and 11.5 mo. Mean levels of LH in OVX rats decreased with age ($p < 0.01$), increased with caloric restriction ($p < 0.05$), and decreased with declining cycling status of the animal prior to OVX (regular [reg] vs. irregular [ir] vs. persistent estrus [pe]; $p < 0.05$). The increased mean LH due to caloric restriction was attributed to an increase in mean pulse amplitude and not to a decrease in time interval between LH pulses. hypothalamus and/or pituitary to enhance LH secretion and do not require a delay in puberty or a period of acyclicity.

227 NAL Call No.: QL55.F43-1993**Logistics of maintaining rats on a NASA space shuttle.**

Goodwin, T.; Powers, M. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 227-231.*

Includes references.

Descriptors: rats; space-flight; cages; environmental-temperature; zero-gravity; duration; humidity

228 NAL Call No.: 389.8-J82**Low protein diets increase neuropeptide Y gene expression in the basomedial hypothalamus of rats.**

White, B. D.; He, B.; Dean, R. G.; Martin, R. J. *J-nutr* v.124(8): p.1152-1160. (1994 Aug.)

Includes references.

Descriptors: dietary-protein; diet; neuropeptides; gene-expression; hypothalamus; cerebral-ventricles; experimental-diets; dietary-fat; dietary- carbohydrate; energy-intake; nutrient-intake; fiber; rna; insulin; corticosterone; food-intake; blood-sugar; blood-serum; body-weight; body- composition; rats

Abstract: Food deprivation elevates both neuropeptide Y (NPY) gene expression in the basomedial hypothalamus and NPY levels in the paraventricular nucleus (PVN). To gain a better understanding of the dietary control of NPY, we systematically examined the effects of macronutrient restriction on the gene expression of NPY in the basomedial hypothalamus and NPY content in the PVN. Rats were fed one of eight different diets for 12 d. The control group was fed a modified AIN-76 diet. One group was fed the modified AIN-76 diet but was restricted in energy by 50%. Six isocaloric (to the control diet) test diets were prepared, each with an individual macronutrient reduced by 50%. Neuropeptide Y gene expression was elevated in protein-restricted animals as well as in energy-restricted animals. Carbohydrate or fat restriction seemed to have no effect on NPY gene expression. Though the NPY content in the PVN was not different between any groups, two findings were consistent with greater NPY release in protein-restricted animals. Animals fed a low protein diet were hyperphagic and had a greater amount of body fat. This study suggests that low levels of dietary protein may have a role in the regulation of NPY gene expression.

229 NAL Call No.: 448.3-Ap5**Massive fungal contamination in animal care facilities traced to bedding supply.**

Mayeux, P.; Dupepe, L.; Dunn, K.; Balsamo, J.; Domer, J. *Appl-environ-microbiol* v.61(6): p.2297-2301. (1995 June)

Includes references.

Descriptors: aspergillus-fumigatus; fungi; microbial-contamination; litter; animal-housing; mice; laboratory-mammals; laboratory-rearing; food- contamination; feeds; fungal-spores; air-spora; beta-chip; sani-chip; cob-litter

Abstract: During the course of immunologic studies involving the gastrointestinal colonization of mice with *Candida albicans*, it became apparent that the animals were being exposed to large numbers of *Aspergillus fumigatus* spores which interfered with the *C. albicans* colonization. To determine the source of the *A. fumigatus* exposure and the extent of fungal contamination of the medical school vivarium and four satellite facilities, fungal analyses of feed, bedding, and air were undertaken. Initial samples from the air were collected with 3-h settle plates; air sampling following cleanup was done with an Andersen air sampler. The source of contamination in the mouse rooms was determined to be Beta Chip bedding, which came from the manufacturer highly contaminated. Beta Chip bedding (1 g) obtained from the manufacturer just prior to testing contained 10(4) CFU of *A. fumigatus*, 20 CFU of a zygomycete, and 10 CFU of a *Penicillium* sp. Coarse-grade Beta Chip had approximately one-half those levels of contamination. Pure Cob bedding was highly contaminated also, but with a *Fusarium* sp. and a *Cladosporium* sp. Untreated and heat-treated Sani-Chip as well as all other heat-treated preparations obtained from the manufacturer contained no detectable spores. Rodent chow direct from the manufacturer had no *A. fumigatus*, although it did contain 150 CFU of fungus per g, including 80 CFU of a *Rhodotorula* sp., 60 CFU of *Cryptococcus uniguttulatus*, and 1 CFU of a *Penicillium* sp. Unopened laboratory canine, feline diet, rabbit, and guinea pig chow, however, had 1.5 X 10(2) to 4.1 X 10(2) CFU of *A. fumigatus* per g. Air sampling confirmed the presence of numerous *A. fumigatus* spores prior to cleanup and the absence or significant reduction in spore. to their use, especially with research animals being used for microbiologic and immunologic studies. It is recommended that Sani-Chip or heat- treated preparations other than Sani-Chip be used for the housing of rodents.

230 NAL Call No.: 410.9-P94

Measurement of cardiovascular and renal function in unrestrained hamsters.

Fox, M.; Natarajan, V.; Trippodo, N. C. *Lab-Anim-Sci* v.43(1): p.94-98. (1993 Feb.)

Includes references.

Descriptors: hamsters; physiological-functions; measurement

Abstract: We describe a preparation for measuring blood pressure, left ventricular end diastolic pressure, heart rate, and renal excretory variables (volume, electrolytes, glomerular filtration rate) in hamsters. The new approach offers an advantage over previously described methods by eliminating the problems associated with restraint. Hamsters were surgically implanted with venous and arterial catheters. A specially constructed bladder catheter, which allows flushing to minimize errors due to dead space and permits urine collection without restraining the animals, was also implanted. The hamsters were allowed to recover from surgery for 3 hours before being studied in a specially designed lucite housing unit. Representative results were obtained in cardiomyopathic and healthy hamsters.

231 NAL Call No.: QP1.C6

Mechanical responses of chromium-deficient developing rat heart.

Penefsky, Z. J.; Elwood, J. C. *Comp-biochem-physiol-Part-A,-Physiol* v.114A(2): p.175-187. (1996 June)

Includes references.

Descriptors: chromium; trace-element-deficiencies; myocardium; heart; contraction; calcium; catecholamines; agonists; beta-adrenergic-agonists; isoprenaline; rats; phenylephrine; alpha-adrenergic-agonists; interval-force-relationship

Abstract: Mechanical responses were compared between controls, developing Sprague-Dawley rat papillary muscle and age-matched weanlings fed with Torula yeast, a food source deficient in chromium. At 8 weeks postnatal, deficient rats differed in significant ways from their normal counterparts. Deficient rats in contrast to controls weighed less, their interval-force (I-F) relationship was more negative and their inotropic response to high calcium concentrations was greater. At this time, however, deficient and control rats responded equally to alpha (phenylephrine) and beta (isoproterenol) agonists. At 10 weeks of age, the controls exhibited a less negative I-F and a negative inotropic response to high calcium concentrations while the response to alpha and beta agonists was unchanged. In contrast, at 10 weeks of age, the chromium-deficient rats exhibited a highly negative I-F response and significant inotropic response to high calcium concentrations. The response of the deficient hearts to beta-agonists diminished. At 13 weeks postnatal, control hearts showed only a 10-15% negative I-F response, a persistent response to catecholamines and negative inotropic responses to high calcium concentrations. In deficient hearts, the negative I-F response was reduced and the response to beta-agonists was further

diminished but a positive inotropic response to phenylephrine and high calcium concentrations persisted. These observations in deficient animals are explained in terms of a retarded development of the calcium handling elements in the heart and a lack of an insulin-like growth factor.

232 NAL Call No.: QL55.H8

Meeting the needs of captive mice and their caretakers.

Wallace, M. E. *Hum-innov-altern. Washington Grove, MD : Psychologists for the Ethical Treatment of Animals, c1991-1994. v. 8 p. 565-568.*

Includes references.

Descriptors: mice; cages; animal-welfare

233 NAL Call No.: QL55.A1L3

A method for the routine observation of sexual behaviour in rats.

Mercier, O.; Perraud, J.; Stadler, J. *Lab-Anim-Lond* v.21(2): p.125-130. ill. (1987 Apr.)

Includes references.

Descriptors: rats; lighting; sexual-behavior; cages; estrus

234 NAL Call No.: QL55.I5

Microbiological contamination of water bottles.

Knight, D. G. *Anim-technol* v.46(3): p.203-209. (1995 Dec.)

Descriptors: rats; drinking-water; bottles; microbial-contamination; temperature; water-intake

Abstract: Ideally the water presented to laboratory animals should contain no chemical contaminants or pathogenic organisms that may be harmful to health. The water should be clear, colourless, odourless, tasteless and of good quality. When presented to animals, water in a bottle may become contaminated by urine, hair, saliva and faecal material of the animals and also from food and bedding materials. Due to this and the room temperature of animal accommodation, microbiological growth in water bottles can be rapid.

235 NAL Call No.: QL55.A1L3

Microbiologically monitored fumigation of a newly built SPF laboratory rodent facility.

Sebesteny, A.; Milite, G.; Martelossi, P. *Lab-Anim* v.26(2): p.132-139. (1992 Apr.)

Includes references.

Descriptors: rats; mice; laboratories; fumigation; gnotobiotic-animals; sterilizing; methyl-bromide; monitoring; specific-pathogen-free-laboratories

Abstract: The initial sanitization and sterilization of a newly built animal facility for the breeding and holding of specified pathogen free (SPF) rats and mice is described. The fumigation programme was started with methyl bromide treatment directed primarily against arthropods, followed by ammonia spray to kill coccidial oocysts and concluded by three formaldehyde treatments with fog and spray against bacteria and viruses. The practicalities and problems involved are described in detail and the rationale and purpose of the programme and its monitoring are discussed. The report is expected to contribute towards the establishment of a rational, efficient and standardized fumigation programme for SPF animal facilities, under increasing constraints of safety and environmental considerations concerning pollution with toxic and corrosive agents.

236 NAL Call No.: QP141.A1A64

Modulation of taste affect by hunger, caloric satiety, and sensory-specific satiety in the rat.

Berridge, K. C. *Appetite* v.16(2): p.103-120. (1991 Apr.)

Includes references.

Descriptors: taste; hunger; satiety; palatability; caloric-intake; appetite; food-preferences; energy-deprivation; physiology; rats

Abstract: Human judgements of the pleasure of sweetness have been reported to be modulated by caloric hunger, satiety, and sensory-specific satiety. This study examined both hedonic and aversive facial/somatic reactions to taste in the rat, in order to confirm the relation of hunger and satiety to taste affect, and to assess whether affective modulation depends upon the cognitive factors that mediate human self-interpretation of affect. In the first experiment, the affective reactions of rats to

sweet, bittersweet, and water tastes were assessed in five states of caloric hunger or satiety. Caloric satiety reduced positive hedonic reactions below normal levels. Conversely, 48-h food deprivation (but not 24-h deprivation) increased hedonic reactivity. Hedonic enhancement by hunger was not restricted to sweet tastes, but also extended to the palatability of water. Only the hedonic reactions to taste were changed by hunger or satiety: taste aversion was not altered. The second experiment compared the magnitude of affective change during sensory-specific satiety and caloric satiety. Taste-reactivity elicited by sucrose solution or milk was assessed after satiating meals of each of those foods. Sensory-specific satiety further reduced hedonic reactions below the level achieved by caloric satiety alone. Both for caloric satiety and for sensory-specific satiety changes in affect were restricted to positive hedonic reactions: no increase in aversion accompanied the hedonic decrements. These results confirm that taste affect is modulated during caloric hunger, caloric satiety, and sensory-specific satiety. In addition they indicate that the modulation of taste affect by hunger and satiety is confined to the positive limb of the two dimensions (hedonic vs. aversive) of palatability.

237 NAL Call No.: QL55.F43-1993

Molecular genetic characterization of inbred rat strains.

Prokop, C. M.; Dorsch, M. M.; Hedrich, H. J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 428-431.*

Poster presentation at the symposium.

Descriptors: rats; dna-fingerprinting; strain-differences; genetic-markers; genetic-mapping; polymerase-chain-reaction

238. NAL Call No.: Videocassette-no.1662

The Mongolian gerbil, *Meriones unguiculatus*.

Kansas State University. College of Veterinary Medicine. Manhattan, Kan. : The College, [1990] 1 videocassette (26 min.) : sd., col..

"07-13-90."

Descriptors: Meriones-unguiculatus/ Gerbils-as-laboratory-animals

Abstract: Presents an overview of gerbil taxonomy, behavior, adaptations, and history as a model in laboratory research. The topics of husbandry, general care, breeding, and preventive medicine through physical examination are also covered.

239. NAL Call No.: Slide-no.431

Mongolian gerbils : care, diseases, and use in research. Mongolian gerbils : care, diseases, and use in research.

Motzel, S. L., Wagner, J. E. & University of Washington. Health Sciences Center for Educational Resources. Seattle, WA :

Produced and distributed by the Health Sciences Center for Educational Resources, University of Washington, 1992. 72

slides : col. + 1 sound cassette (29 min.) + 1 guide..

Developed for the American College of Laboratory Animal Medicine.

Descriptors: Gerbils-/ Gerbils-as-laboratory-animals

Abstract: Covers biology, anatomy, physiology, husbandry, uses in research, most common infectious and noninfectious diseases.

240 NAL Call No.: QL55.F43-1993

Monitoring home cage activity in rats over 24 hours.

Scott, L.; Hollands, R. N. *Welfare and science proceedings of the Fifth Symposium of the Federation of European*

Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal

Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 364-366.

Poster presentation at the symposium.

Descriptors: rats; physical-activity; drug-effects; nocturnal-activity; activity-sampling

241 NAL Call No.: QL55.F43-1993

Morbid obesity: does dietary treatment affect the development of adipose tissue cellularity in Zucker rat.

Herberg, L.; Schraven, A.; Partke, H. J.; Loffler, G. *Welfare and science proceedings of the Fifth Symposium of the*

Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European

Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 130-133.

Includes references.

Descriptors: rats; obesity; adipocytes; age-differences; adipose-tissue; dietary-fat; dietary-carbohydrate; line-differences; genetic-variation; cell- differentiation; cells; depot-fat; stromal-vascular-cells

242 NAL Call No.: QL55.H8**A mouse-friendly cage compared experimentally with a person oriented one.**

Wallace, M. E. *Hum-innov-altern. Washington Grove, MD : Psychologists for the Ethical Treatment of Animals, c1991-1993. v. 7 p. 534-539.*

Includes references.

Descriptors: mice; cages; animal-welfare

243 NAL Call No.: 410.9-P94**Mouse models of short- and long-term foreign body in the urinary bladder: analogies to the bladder segment of urinary catheters.**

Johnson, D. E.; Lockett, C. V.; Hall Craggs, M.; Warren, J. W. *Lab-Anim-Sci* v.41(5): p.451-455. (1991 Oct.)

Includes references.

Descriptors: mice; animal-models; bladder; catheters; foreign-bodies; bacterial-diseases; experiments; long-term-experiments; bacteriuria; short-term-experiments

Abstract: Catheter-associated bacteriuria is the most common infection occurring in hospitals, where urethral catheters are generally in place for a few days, and in nursing homes, where catheters may be in place for months or years. We developed murine models with intrabladder urinary catheters for studying complications of bacteriuria in short- and long-term catheterization. In the short-term model, a catheter segment was inserted transurethraly and lay free within the bladder lumen. Half of the animals expelled segments during a 2-to-7-day period, durations similar to catheterizations in hospitalized patients. For studies of long-term catheter use, the catheter segment was secured within the bladder by a single suture for up to 12 months. Antibiotics administered for 7 days after catheter placement and housing mice in cages with wire screen floors reduced spontaneous bacteriuria to an acceptably low incidence rate of only 7%. *Proteus mirabilis* bacteriuria of high concentration provoked the same complications that are common in patients with long-term catheters: acute pyelonephritis, chronic renal inflammation, and struvite stone formation. These models allow inoculation of the bacteria of interest and are suitable for studies of short- and long-term foreign body-associated bacteriuria and its complications.

244 NAL Call No.: QL55.I5**Murine cage density: a comparison between the reproductive performance of an inbred and outbred strain of monogamous breeding pairs.**

Eveleigh, J. R.; Williams, H. L. *Anim-Tech-J-Inst-Anim-Tech* v.43(1): p.43-47. (1992 Apr.)

Includes references.

Descriptors: mice; cage-density; reproductive-performance

Abstract: Cage densities of CD-1 and Balb/c mice were compared during breeding. A monogamous breeding pair of outbred CD-1 mice have a greater cage density than inbred BALB/c mice at all stages of the reproductive cycle. At parity 1 and 2 on day 19 of lactation cage density is at its greatest when the population of CD-1 mice expressed in weight are respectively 71 and 82% heavier than BALB/c. Sixty nine percent of CD-1 litters and 5% of BALB/c litters had a mean litter size at birth of 14 or more. It is suggested that further investigation is warranted into whether the minimum floor area of 300 cm² recommended by the Laboratory Animal Breeders Association is optimal for outbred monogamous breeding pairs of mice.

245 NAL Call No.: QL55.A1L3**Murine cage density: cage ammonia levels during the reproductive performance of an inbred strain and two outbred stocks of monogamous breeding pairs of mice.**

Eveleigh, J. R. *Lab-Anim* v.27(2): p.156-160. (1993 Apr.)

Includes references.

Descriptors: mice; cage-density

Abstract: The Laboratory Animal Breeders Association guidelines recommend a minimum floor area of 300 cm² for a monogamous pair of inbred/outbred mice or a trio of inbreds. The mean level of ammonia produced during lactation from BALB/c, TO and CD-1 breeding pairs housed in M2 cages with a floor area of 300 cm² on Day 4 after cleaning was 30 ppm, 87 ppm and 92 ppm, respectively. All 3 strains of mice, particularly the outbred strains, were subjected to high levels of ammonia as compared with human long-term health and safety occupational exposure limits (25 ppm). However, there is a gradient of ammonia within an M2 breeding cage from the nest (19 ppm), to the food hopper, 77 ppm. By housing CD-1 pairs of mice in RM2 cages which have more than double the floor area of M2 cages (676 cm²), the mean level of ammonia

during lactation on Day 4 after cleaning was reduced to 26 ppm. The reproductive performance on inbred/outbred strains of mice has to be equated with cage size (floor area) to maintain acceptable levels of ammonia. It is suggested that the recommended minimum floor areas for breeding mice be reviewed.

246 NAL Call No.: QR46.J6

Murine infection model for maintenance and amplification of *Cryptosporidium parvum* oocysts.

Petry, F.; Robinson, H. A.; McDonald, V. *J-clin-microbiol* v.33(7): p.1922-1924. (1995 July)

Includes references.

Descriptors: cryptosporidium-parvum; oocysts; culture-techniques; mice; immunosuppression; animal-models; dexamethasone

Abstract: Propagation of *Cryptosporidium parvum* is problematic because in vitro development of the parasite is poor and animals are only briefly susceptible as neonates. At present oocysts of the parasite are usually procured by passage in neonatal sheep or cattle. In the present study, large numbers of oocysts of *C. parvum* could be isolated following infection of dexamethasone-treated adult C57BL/6 mice. The amount of immunosuppressive drug and the regimen of administration were critical for successful maintenance of the parasite, however. Routinely, 10 mice (age, 8 to 12 weeks) were injected four times on alternate days with 1.0 mg of dexamethasone, and the last injection was given on the same day as oral inoculation with 10(6) oocysts. By using a simplified procedure for oocyst purification from mouse feces, approximately 10(9) oocysts were obtained. This model is inexpensive and comparatively safe to handle, and the numbers of animals inoculated can be varied to obtain the required number of oocysts. Thus, this murine infection model would be a suitable alternative to the use of neonatal calves or sheep for efficient oocyst propagation.

247 NAL Call No.: 391.8-T662

Murine susceptibility to organophosphorus-induced delayed neuropathy (OPIDN).

Veronesi, B.; Padilla, S.; Blackmon, K.; Pope, C. *Toxicol-Appl-Pharmacol* v.107(2): p.311-324. (1991 Feb.)

Includes references.

Descriptors: organophosphorus-compounds; nervous-system-diseases; evaluation; spinal-cord; mice

Abstract: This study reports that CD-1 strain mice are neuropathologically and biochemically responsive to acute doses of tri-ortho-cresyl phosphate (TOCP). Young (25-30 g) male and female animals were exposed (po) to a single dose of TOCP (580-3480 mg/kg) and sampled for neurotoxic esterase (NTE) activity at 24 and 44 hr postexposure and for neuropathic damage 14 days later. Biochemically, high intragroup variability existed at the lower doses, and at higher levels of TOCP exposure (i.e., greater than or equal to 1160 mg/kg), mean brain NTE inhibition never exceeded 68%. Hen and mouse brain NTE activity, assayed in vitro for sensitivity to inhibition by tolyl saligenin phosphate (TSP), the active neurotoxic metabolite of TOCP, showed similar IC50 values. Histologically, highly variable spinal cord damage was recorded throughout treatment groups and mean damage scores followed a dose-response pattern with no apparent correlation to threshold (i.e., greater than or equal to 65%) inhibition of brain NTE activity. Topographically, axonal degeneration in the mouse spinal cord predominated in the lateral and ventral columns of the upper cervical cord. Unlike the rat, which displays degeneration in the upper cervical cord's dorsal columns (i.e., gracilis fasciculus) in response to TOCP intoxication, treated mice showed minimal damage to this tract. To examine this discrepancy further, ultrastructural morphometric analysis of axon diameters in the cervical cord was performed in control mice and rats. These results indicated that in both species, the largest diameter (greater than or equal to 4 micrometer) axons are housed in the ventral columns of the cervical spinal cord, suggesting that axon length and diameter may not be the only criteria underlying fiber tract vulnerability in OPIDN.

248 NAL Call No.: 447.8-Am3

Naloxone blocks that portion of feeding driven by sweet taste in food-restricted rats.

Levine, A. S.; Weldon, D. T.; Grace, M.; Cleary, J. P.; Billington, C. J. *Am-j-physiol* v.268(1, pt.2): p.R248-R252. (1995 Jan.)

Includes references.

Descriptors: food-deprivation; food-intake; food-preferences; taste; naloxone; satiety; appetite; rats

Abstract: We evaluated the potency of naloxone on intake of normal and sweet chow in food-deprived and schedule-fed rats. We found that naloxone's anorectic potency was dependent on the type of chow presented to the rats and the deprivation schedule utilized to stimulate food intake. In 24-h and 48-h deprived rats, naloxone decreased intake of normal rat chow at doses ranging from 0.3 to 3 mg/kg. In chronically deprived rats (80% of normal body wt), these doses of naloxone failed to

decrease intake of normal chow. Rats eating sweet chow ate more when energy deprived and were more sensitive than rats eating normal chow to naloxone-induced limitations in food intake, both in acute and chronic food-deprived groups. Thus naloxone decreased intake of sweet chow much more effectively than normal chow even when rats were chronically food deprived. We also found that an extremely low dose of naloxone (0.03 mg/kg) decreased intake of sweet chow by almost 50% in satiated rats.

249 NAL Call No.: 410.9-P94

Natural and subclinical *Corynebacterium kutscheri* infection in rats.

Amao, H.; Komukai, Y.; Akimoto, T.; Sugiyama, M.; Takahashi, K.; Sawada, T.; Saito, M. *Lab-anim-sci* v.45(1): p.11-14. (1995 Feb.)

Includes references.

Descriptors: rats; corynebacterium; infections; latent-infections; animal-tissues; organs; distribution; natural-infections

Abstract: Distribution of *Corynebacterium kutscheri* was determined in 41 rats housed in a conventionally managed colony that were infected naturally and subclinically. At 2, 5, 10, 20 and 25 months after initial isolation of *C. kutscheri*, attempts were made to isolate *C. kutscheri* from 17 sites, with a new selective medium, FNC agar. In total, the prevalence (97.6%) of *C. kutscheri* isolation was significantly ($P < 0.001$) higher than the frequency (70.7%) of antibody detection. None of the rats manifested any distinct clinical signs of disease and macroscopic lesions caused by *C. kutscheri* were not detected. In 40 rats with subclinical infection, the organisms were most frequently isolated from the oral cavity, esophagus, cecal contents, and colon and rectum (> 95.0%). The isolation rate was next highest in the trachea, submaxillary lymph nodes, and nasal cavity (47.5 to 52.5%). The organisms hardly colonized the lung, liver, and kidney. Mean numbers of organisms found in the esophagus, cecal contents, and colon and rectum ranged from 10(3.9) to 10(4.2) CFU/g, and were significantly ($P < 0.05$, $P < 0.01$) high in comparison with those in the lung. These results indicated that many healthy rats in the naturally infected colony harbored *C. kutscheri*, and the organisms colonized the oral cavity, esophagus, cecal contents, and colon and rectum most frequently.

250 NAL Call No.: 410.9-P94

Natural habitats of *Corynebacterium kutscheri* in subclinically infected ICGN and DBA/2 strains of mice.

Amao, H.; Komukai, Y.; Sugiyama, M.; Takahashi, K.; Sawada, T.; Saito, M. *Lab-anim-sci* v.45(1): p.6-10. (1995 Feb.)

Includes references.

Descriptors: mice; corynebacterium; latent-infections; organs; animal-tissues; distribution; strain-differences; chronic-infections; carrier-state

Abstract: Subclinically infected mice of ICGN and DBA/2 strains housed in a conventionally managed colony were examined to determine natural habitats of *Corynebacterium kutscheri*. At 5, 7, 10, 12 and 13 months after initial isolation of the organism from oral cavity and cecal contents of five ICGN mice, attempts were made to isolate *C. kutscheri* from 18 sites using a new selective medium, furazolidone-nalidixic acid-colimycin agar. From the initial survey to 13 months, *C. kutscheri* was isolated from 27 of 29 ICGN mice (93.1%) and 9 of 10 DBA/2 mice (90%). In contrast, antibody against *C. kutscheri* was detected in only 3 of 29 ICGN mice (10.3%). None of the mice manifested distinct clinical signs of infection, and only 1 ICGN mouse had macroscopic lesions such as hepatic abscess and large spleen. In 21 ICGN and 9 DBA/2 mice that harbored the organism without macroscopic lesions, the organisms were most frequently isolated from the oral cavity (ICGN:100%, DBA/2:66.7%), cecum (ICGN: 95.2%, DBA/2:100%), and colon and rectum (ICGN:95.2%, DBA/2:100%). Remarkable differences between the two mouse strains were observed in colonization of the nasal cavity (ICGN:85.7%, DBA/2:0.0%) and trachea (ICGN:71.4%, DBA/2:33.3%). In mice of both strains, the organisms rarely colonized the lung, liver, and kidney. Mean numbers of organisms in the cecum, and colon and rectum ranged from 10(4.1) to 10(4.6) colony-forming units/g and were significantly higher in comparison with those in the small intestine ($P < 0.01$, $P < 0.001$). Results of this study indicate that these strains of mice are capable of harboring *C. kutscheri* naturally for a long time with no evidence of illness and no detectable serum antibodies, and that the organisms most frequently.

251 NAL Call No.: QP351.B45

Neurological dissociation of gastrointestinal and metabolic contributions to meal size control.

Seeley, R. J.; Grill, H. J.; Kaplan, J. M. *Behav-neurosci* v.108(2): p.347-352. (1994 Apr.)

Includes references.

Descriptors: feeding-behavior; portion-size; food-deprivation; metabolism; digestive-tract; brain; rats

252 NAL Call No.: QP141.A1P46**Neuropeptide Y and galanin in the central control of food intake and body weight.**

Leibowitz, S. F. *Pennington-Cent-Nutr-Ser. Baton Rouge : Louisiana State University Press. 1992. v. 2 p. 235-256.*

Literature review.

Descriptors: food-intake; body-weight; peptides; energy-intake; energy-metabolism; obesity; fat-consumption; appetite-disorders; norepinephrine; nutrition-physiology; literature-reviews

Abstract: Evidence suggests that the feeding-stimulatory peptides, neuropeptide Y (NPY) and galanin (GAL), act through different medial hypothalamic mechanisms to control energy intake, metabolism, and body weight. Neuropeptide Y stimulates carbohydrate ingestion, increases respiratory quotient and lipogenesis, and potentiates the release of corticosterone, insulin, aldosterone, and vasopressin. This anabolic peptide is most active at the onset of the natural feeding cycle and after periods of food deprivation. Moreover, chronic NPY stimulation produces profound hyperphagia and obesity and endogenous NPY concentration and NPY gene expression are increased in genetically obese animals, suggesting that NPY may contribute to the development of disturbed eating patterns and obesity. In contrast to NPY, GAL stimulates primarily fat ingestion, decreases energy expenditure, and inhibits the release of corticosterone and insulin. Moreover, studies of GAL gene expression show that GAL mRNA is reduced in 11-week-old Zucker obese rats but increased in 40-week-old animals, and that peptide synthesis after food deprivation is increased only in obese, not lean, animals. Evidence suggests that GAL may control fat ingestion at the end of the natural feeding cycle when fat intake normally rises.

253 NAL Call No.: 447.8-Am3**Neuropeptide Y fails to increase intraoral intake in rats.**

Seeley, R. J.; Payne, C. J.; Woods, S. C. *Am-j-physiol* v.268(2,pt.2): p.R423-R427. (1995 Feb.)

Includes references.

Descriptors: ingestion; appetite; food-deprivation; neuropeptides; stimulation; rats; consummatory-phase-of-ingestion

Abstract: Neuropeptide Y (NPY) has a potent orexigenic effect when administered either into the third ventricle or directly into hypothalamic nuclei, but the mechanism by which NPY increases intake is poorly understood. The present study tested the ability of NPY to increase intake of the rat in the intraoral intake test, which focuses on the highly stereotyped consummatory phase of ingestion by introducing a 0.1 M sucrose solution directly into the oral cavity of rats via indwelling intraoral cannulas. Doses of 3, 9.5, and 30 micrograms of NPY, when administered into the third ventricle, all failed to change intraoral intake compared with a saline control. Food deprivation (24 h), however, nearly doubled intraoral intake. Additionally, in separate experiments, 9.5 micrograms of NPY significantly increased both 1-h food intake and 1-h bottle intake of 0.1 M sucrose. These results are consistent with two conclusions. 1) NPY does not affect the consummatory phase of ingestion. 2) NPY administration does not completely mimic the stimulus state associated with food deprivation, since food deprivation but not NPY administration increases intake in the intraoral intake test.

254 NAL Call No.: QL55.A1L3**A new device for long-term continuous enteral nutrition of rats by elementary diet via gastrostomy, following extensive oesophageal or lower gastrointestinal surgery.**

Muller, G.; Schaarschmidt, K.; Stratmann, U. *Lab-Anim* v.26(1): p.9-14. (1992 Jan.)

Includes references.

Descriptors: rats; tube-feeding; cannulae; cannulation; long-term-experiments; elemental-diets; feces-collection

Abstract: A device for intragastric nutrition of unsedated and minimally restrained rats under complete alimentary abstinence has been developed. The cannulation system consists of an infusion pump, modified glass syringe as flow swivel, rat-harness and a silicone-tube-gastrostomy. The animals were kept in special cages and coprophagy was prevented by an own model of faecal collection cup. Methionine and Ca- glycerophosphate had to be added to a commercial elementary diet. The rats were allowed to move freely during intragastric infusion, which was applied for 14 to 28 days in 118 Wistar-rats (350-400 g). They maintained weight on an energy supply of 86.4 kcal/day.

255 NAL Call No.: 410.9-P94**A new model for study of pancreatic exocrine secretion: tethered pancreatic fistula rat.**

Toriumi, Y.; Samuel, I.; Wilcockson, D. P.; Joehl, R. J. *Lab-anim-sci* v.44(3): p.270-273. (1994 June)

Includes references.

Descriptors: rats; animal-models; animal-welfare; pancreas; fistula; restraint-of-animals; tethering

Abstract: Diversion and recirculation of bile and pancreatic juice in rats are done in studies of pancreatic exocrine secretion. Previously, the modified Bollman cage was used to restrain rats with bile and pancreatic fistulas. To mimic physiologic conditions as closely as possible and to develop a more humane model, we designed a partial-restraint tethering system to study pancreatic exocrine secretion. Eight rats were prepared with biliary pancreatic, and duodenal fistulas, of which five were given enteral supplements via a gastric fistula and three were given saline supplements via a jugular venous line. Catheters exited at the nape of the neck and passed through the hollow of a cable coil that tethered the rat. On the fourth postoperative day pancreatic juice flow and protein output were studied. The tethering system allowed grooming, feeding, and ample mobility. This model of the tethered pancreatic fistula rat is a more humane model for studies of pancreatic exocrine secretion in conscious rats, compared with the Bollman cage system of near total restraint.

256 NAL Call No.: QL55.F43-1993

New parainfluenza virus isolate from guineapigs.

Sato, H.; Miyata, H.; Watanabe, Y. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 390-392.*

Poster presentation at the symposium.

Descriptors: guinea-pigs; parainfluenza-3-virus; sentinel-animals; lungs; asymptomatic-infections

257 NAL Call No.: RC628.A102

Nitrogen balances of lean and obese Zucker rats subjected to a cafeteria diet.

Esteve, M.; Rafecas, I.; Remesar, X.; Alemany, M. *Int-J-Obesity* v.16(4): p.237-244. (1992 Apr.)

Includes references.

Descriptors: nitrogen-balance; obesity; diet; food-preferences; nitrogen-retention; urine; comparisons; rats

Abstract: The effects of a cafeteria diet on nitrogen balance in lean (Fa/?) and obese Zucker rats (fa/fa) was studied for two consecutive 15 day periods after weaning. Obese rats were able to absorb a lower proportion of dietary nitrogen than the lean controls. Cafeteria diet increased the retention of dietary nitrogen, and lowered urinary nitrogen losses in both obese and lean rats. Urea constituted practically the only product of urinary nitrogen excretion in obese rats, whereas it accounted for only about 75% of that eliminated by Fa/? rats. Nitrogen accretion in the body was highest for the younger animals, and again increased with cafeteria feeding. Obese fa/fa rats showed a lower percentage of body nitrogen retention than their lean counterparts; obese rats were able, however, to accumulate large amounts of nitrogen and fat, in part because of their higher intake. A significant part of the absorbed nitrogen was not found in either the body or the urine; the cafeteria diet markedly increased the weight of this fraction of nitrogen unaccounted for. In conclusion, the effects of cafeteria feeding on weight and nitrogen handling were comparable in lean and obese rats, i.e. the effects of genetic and dietary obesity seem to be additive with regard to nitrogen extraction and excretion for Zucker rats.

258 NAL Call No.: QL55.F43-1993

Nutrition as a potential interference factor in animal experimentation.

Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 212-219.*

Includes references.

Descriptors: rats; diet; animal-experiments; feed-intake; feed-composition-tables; nutrient-content; restricted-feeding

259 NAL Call No.: QL55.A1L3

Observations on the effects of vibration and noise on plasma ACTH and zinc levels, pregnancy and respiration rate in the guineapig.

Bailey, K. J.; Stephens, D. B.; Delaney, C. E. *Lab-Anim-Lond* v.20(2): p.101-108. (1986 Apr.)

Includes references.

Descriptors: guinea-pigs; pregnancy; respiration-rate; zinc; corticotrophin; blood-plasma; vibration; noise

260 NAL Call No.: QL55.A1L3

An outbreak of Streptococcus pyogenes infection associated with calcium oxalate urolithiasis in guineapigs (Cavia porcellus).

Okewole, P. A.; Odeyemi, P. S.; Oladunmade, M. A.; Ajagbonna, B. O.; Onah, J.; Spencer, T. *Lab-Anim* v.25(2): p.184-186.

(1991 Apr.)

Includes references.

Descriptors: guinea-pigs; streptococcus-pyogenes; symptoms; urolithiasis; calcium-oxalate; drug-therapy; oxytetracycline; susceptibility

Abstract: An outbreak of *Streptococcus pyogenes* infection occurred in a colony of 800 Dunkin-Hartley guineapigs resulting in 364 (46%) deaths involving breeders, sucklings, weaners, but mainly adults used as a source of blood meals for haematophagus flies (*Glossina palpalis*). Clinical signs included bleeding from the nose, mouth and vagina before death. Necropsy revealed pneumonia with consolidation of one or both lungs, haemopericardium and haemothorax. There were yellowish-grey deposits in the urinary bladder of more than 50% of both affected breeders and adults used for feeding haematophagus flies. Beta-haemolytic *Streptococcus pyogenes* was isolated in pure culture from many tissues including the urinary bladder. The survivors were treated with oxytetracycline (Terramycin-LA; Pfizer) using the intra-muscular route and the response was good.

261 NAL Call No.: QL55.F43-1993

Pain assessment and relief in rats.

Liles, J. H.; Flecknell, P. A. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 14-19.*

Includes references.

Descriptors: rats; pain; experimental-surgery; body-weight; animal-welfare; analgesics; physical-activity; animal-behavior; veterinary-products

262 NAL Call No.: NLM-W1-KO2817

Parasitic localization and growth in Mongolian gerbil (*Meriones unguiculatus*) sic infected with filarial *Dipetalonema viteae* under different lighting conditions.

Mizuno, F.; Nogami, S.; Maruhashi, M.; Matsumura, T. *Kobe-J-Med-Sci. Kobe, Japan, The Kobe University School of Medicine. Aug 1982 v. 28 (4) p. 155-160.*

Descriptors: Light; Localization; Growth,-Nematoda; Sex-of-parasite; Dipetalonema-viteae-Nematoda

Abstract: *Dipetalonema viteae* in Mongolian gerbils housed in continuous light, continuous darkness or in 14 hours of light in 24 hours, localization site of adult worms, their sex and their length examined 90 days later, no significant differences between sexes but localizations and size varied according to light conditions. ♦

263 NAL Call No.: QL55.F43-1993

Pathology of ageing LEW/Han rats. I. Age-dependent mortality, tumour incidence and tumour spectrum.

Baum, A.; Pohlmeyer, G.; Rapp, K. G.; Deerberg, F. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 269-271.*

Includes references.

Descriptors: rats; aging; longevity; lifespan; sex-differences; neoplasms; causes-of-death; strain-differences; mortality

264 NAL Call No.: QL55.F43-1993

Pathology of ageing LEW/Han rats: II. Strain-specific neoplasms of endometrium and haemopoietic system.

Pohlmeyer, G.; Baum, A.; Deerberg, F. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 271-273.*

Includes references.

Descriptors: rats; strain-differences; endometrium; carcinoma; bone-marrow-disorders; aging; lymphoma; inbred-strains

265 NAL Call No.: QP141.A1A64

Persistence of sham feeding after intragastric meals in rats.

Mook, D. G.; Atkinson, B.; Johnston, L.; Wagner, S. *Appetite* v.20(3): p.167-179. (1993 June)

Includes references.

Descriptors: feeding-behavior; food-deprivation; meal-patterns; body-weight; rats

Abstract: In rats on a stringent deprivation schedule and at reduced body weight, an intragastric load of liquid diet that equals or exceeds normal meal size has no effect at all on subsequent sham feeding of milk diet or of glucose. Removing the acute deprivation period and reversing, or preventing, severe weight reduction has no effect on this "persistence" of sham feeding: a full intragastric meal may leave sham feeding quite unaffected, even if that meal follows the previous meal at a physiological interval, in rats at normal weight. These data contrast with graded, dose-dependent effects of other manipulations by other investigators. Perhaps such effects depend on conditioned or anticipatory controls of feeding, whereas our findings apply to unconditioned controls.

266 NAL Call No.: 447.8-Am3

Photoperiod-dependent fat pad mass and cellularity changes after partial lipectomy in Siberian hamsters.

Mauer, M. M.; Bartness, T. J. *Am-j-physiol* v.270(2,pt.2): p.R383-R392. (1996 Feb.)

Includes references.

Descriptors: body-fat; adipocytes; adipose-tissue; excision; mass; food-intake; photoperiod; hamsters; phodopus-sungorus

Abstract: Long day (LD)-housed Siberian hamsters show compensatory mass increases in nonexcised white adipose tissue (WAT) after partial lipectomy, whereas hamsters exposed to short days (SDs) for 22 wk do not. The purpose of this experiment was to determine the cellularity changes underlying lipectomy-induced WAT compensation and whether the duration of SD exposure affects this compensation. Male Siberian hamsters were epididymal (E) or inguinal (I) WAT lipectomized (x) or sham-lipectomized (Sham) and either remained in LDs or were transferred to SDs and killed 6 or 12 wk later. In LDs, lipectomized hamsters showed compensatory mass increases in retroperitoneal WAT (RWAT) due to hyperplasia. IWAT mass also was increased by approximately 40% in LD-housed EWATx hamsters because of nonsignificant increases in adipocyte size and number at weeks 6 and 12, respectively. SD-housed hamsters responded to lipectomy by delaying the SD-associated body fat loss so that RWAT mass was reduced only one-third as much in lipectomized as in Sham hamsters, and the IWAT adipocytes of EWATx hamsters were larger than in Sham hamsters at week 6. At week 12, there was little indication of fat pad compensation by SD-housed hamsters. Collectively, the results of the present experiment and our previous study (16) suggest that the inhibitory effect of SDs on fat pad compensation after lipectomy increases with prolonged SD exposure.

267 NAL Call No.: 410.9-P94

Physiological response to experimentally induced anemia in rats: a comparative study.

Redondo, P. A.; Alvarez, A. I.; Diez, C.; Fernandez Rojo, F.; Prieto, J. G. *Lab-anim-sci* v.45(5): p.578-583. (1995 Oct.)

Includes references.

Descriptors: rats; animal-experiments; anemia; hemolysins; hemorrhage; hematopoiesis; hemoglobin-value; hematocrit; reticulocytes; erythrocytes; adaptation; erythrocyte-fragility; hypoxia; phenylhydrazine; blood-loss

Abstract: To induce anemia experimentally in rats to provide a hematocrit of 30 to 35% and provide data about the physiologic response to anemia during induction and after it is established, two methods were selected: the application of repetitive doses of phenylhydrazine and bleeding. Blood sample collection was carried out at various times, and hematologic profiles and osmotic resistance were evaluated. The morphologic features of cells and distinct organs also were examined. Results indicated similar decrease of hematocrit and hemoglobin concentration for the two experimental groups, although the reticulocyte response was higher in rats treated with phenylhydrazine, where the presence of young erythrocyte populations was linked to increases in osmotic resistance and glucose utilization. 2,3-Diphosphoglycerate was induced only during the recovery phase of the study and corresponded to a gradual response to hypoxia. Histologically, marked erythroid hyperplasia was found in the bone marrow, and extramedullary hematopoiesis was seen in the spleen and liver.

268 NAL Call No.: 444.8-G28

Pineal gland and melatonin affect testicular status in the adult marsh rice rat (*Oryzomys palustris*).

Edmonds, K. E.; Stetson, M. H. *Gen-comp-endocrinol* v.99(3): p.265-274. (1995 Sept.)

Includes references.

Descriptors: oryzomys; pineal-body; pinealectomy; melatonin; photoperiod; testes

Abstract: The effects of the presence or absence of the pineal gland and of melatonin administration were examined on testicular maintenance, regression, and recrudescence in adult male rice rats. Pinealectomy at the beginning of the study caused significant testicular regression in animals housed on both long (16L:8D) and short (12L:12D) photoperiods (Experiment/1). Sham-operated males maintained testicular weight on 16L:8D and underwent testicular regression on

12L:12D. The magnitude of testicular regression in pinealectomized animals was reduced relative to that of sham-operated animals housed on a short photoperiod and occurred on a different time course. Animals pinealectomized after testicular regression had occurred on 12L:12D demonstrated delayed photostimulated testicular recrudescence when housed on 16L:8D, while spontaneous testicular recrudescence was unaffected in animals maintained on 12L:12D (Experiment 2). Administration of melatonin via subcutaneous implants at the beginning of the study (Experiment 3) produced similar effects on testicular function attributed to pinealectomy in Experiment 1. Finally, melatonin implants administered after the testes regressed on 12L:12D delayed both photostimulated and spontaneous testicular recrudescence in animals housed on long or short photoperiods, respectively (Experiment 4). These results suggest a role for both the pineal gland and melatonin at various stages of the annual reproductive cycle of the male rice rat.

269 NAL Call No.: 389.8-J82

Platelet thrombus formation and hemostasis are delayed in the microcirculation of copper-deficient rats.

Schuschke, D. A.; Saari, J. T.; Nuss, J. W.; Miller, F. N. *J-nutr* v.124(8): p.1258-1264. (1994 Aug.)

Includes references.

Descriptors: copper; mineral-deficiencies; dietary-minerals; platelets; hemostasis; blood-coagulation; nutritional-adequacy; clotting; heart-rate; blood-pressure; liver; blood-plasma; hematocrit; thromboplastin; prothrombin; arteries; veins; rats

Abstract: The role of dietary copper in platelet thrombus formation and hemostasis was studied in the cremaster muscle microcirculation. Male weanling Sprague-Dawley rats were fed purified diets that were either copper-adequate (94 micromole Cu/kg diet) or copper-deficient (0 micromole Cu/kg diet) for 1, 3 or 5 wk. The rats were anesthetized with pentobarbital, and the cremaster was spread in a Krebs-filled tissue bath. Fluorescein isothiocyanate tagged to bovine serum albumin (FITC-BSA) was injected intra-arterially. After a 20-min equilibration, blue light (1.8 W/cm², 450-490 nm) was used to activate the FITC-BSA and induce platelet thrombus formation within the vasculature. In vivo television microscopy was used to quantify the thrombus formation. In rats fed the copper-deficient diet for 3 or 5 wk, platelet thrombus formation induced by photoactivation was significantly ($P < 0.05$) delayed and prothrombin time was significantly longer but the number of circulating platelets was significantly greater than in age-matched rats fed the copper-adequate diet. Bleeding time, measured after micropuncture of a second-order venule, was significantly longer but hematocrit was significantly lower in rats fed the copper-deficient diet than in those fed the copper-adequate diet. The results demonstrate that platelet-mediated hemostasis is depressed in dietary copper deficiency and that this may be due to a decrease in hematocrit, a decrease in the activity of a coagulation factor and/or an alteration of platelet function.

270 NAL Call No.: QL55.F43-1993

Pneumocystis carinii--rodent animal models.

Russell, R. J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 134-137.*

Includes references.

Descriptors: rats; mice; pneumocystis-carinii; disease-models; barrier-husbandry; animal-health; immunosuppression

271 NAL Call No.: QL55.A1L3

Population density and growth rate in laboratory mice.

Peters, A.; Festing, M. *Lab-anim* v.24(3): p.273-279. (1990 July)

Includes references.

Descriptors: mice; cage-density; growth-rate

Abstract: Home Office guidelines recommend an area of 60 cm² per mouse for growing mice up to 30 g. However, the overall growth rate, and final adrenal weight of weanling BALB/c and MF1 strain mice was not affected by being housed at a density of down to 27 cm² per mouse, though there was some evidence of strain differences in ability to tolerate such dense housing. The presence of cage accessories had no effect on growth rate of BALB/c and female mice, but reduced growth of MF1 and male mice, though the effect was small. It is concluded that present Home Office guidelines make a generous provision for the space requirements of growing laboratory mice, and that the use of cage accessories of varying design may be worth exploring in more detail.

272 NAL Call No.: 410.9-P94

Practical and effective eradication of pinworms (*Syphacia muris*) in rats by use of fenbendazole.

Coghlan, L. G.; Lee, D. R.; Psencik, B.; Weiss, D. *Lab-anim-sci* v.43(5): p.481-487. (1993 Oct.)

Includes references.

Descriptors: rats; syphacia; fenbendazole

Abstract: Oxyurid parasites are common contaminants of laboratory rodents, and despite many described treatments, no method has assumed preeminence. Limitations in drug efficacy and the general inability to control for exposure to infective eggs are the primary contributors to treatment failure. In addition, some effective drugs must be eliminated from consideration because of narrow safety margins, other toxic aspects, or concerns related to particular uses of the experimental animals. As an alternative to currently described treatments or surgical derivation, we conducted an efficacy study against *Syphacia muris* in rats with a new fenbendazole-based protocol. Fenbendazole is a highly efficacious broad-spectrum anthelmintic with adulticidal, larvicidal, and ovicidal actions. Its pharmacokinetic behavior, ovicidal activity, and exceptionally wide safety margin in rats and mice make it an attractive choice for pinworm treatment. We used a 150-ppm medicated feed formulation to reach a targeted dose of 8.0 to 12.0 mg/kg/day in three separate studies designed to assess drug intake and efficacy under different housing conditions and in breeding and nonbreeding populations of ACI rats. In all cases, drug was given on alternating weeks, and nonbreeding populations were medicated for a cumulative period of 14 days. The same schedule was used for breeding populations, but the treatment was repeated after a 2-week rest period to ensure sufficient exposure for newly weaned animals. The results of eliminating *S. muris*.

273 NAL Call No.: QL55.F43-1993

Practical assessment of adverse effects and its use in determining humane end-points.

Townsend, P.; Morton, D. B. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 19-23.*

Includes references.

Descriptors: mice; controls-experimental; experimental-design; animal-experiments; animal-welfare; adverse-effects; animal-behavior; body-temperature; endotoxins; dosage; laboratory-workers; toxicity; assessment

274 NAL Call No.: QL55.F43-1993

Prediction of diabetes incidence in BB/OK rats using maximum-likelihood estimation provides evidence for the genetic determination of variable incidence.

Vogt, L.; Kloting, I. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 41-44.*

Includes references.

Descriptors: rats; diabetes; prediction; algorithms; animal-welfare; sex-ratio; genetic-effects; familial-incidence; phenotypes; maximum-likelihood; inbred-lines; genetic-disorders

275 NAL Call No.: 447.8-Am3

Preference and diet type affect macronutrient selection after morphine, NPY, norepinephrine, and deprivation.

Welch, C. C.; Grace, M. K.; Billington, C. J.; Levine, A. S. *Am-j-physiol* v.266(2,pt.2): p.R426-R433. (1994 Feb.)

Includes references.

Descriptors: feeding-preferences; dietary-fat; dietary-protein; dietary-carbohydrate; neuropeptides; morphine; norepinephrine; food-deprivation; neuropeptide-y; orexigenic-agents

Abstract: The orexigenic agents morphine, neuropeptide Y (NPY), and norepinephrine (NE) and deprivation have been reported to induce selection of specific macronutrients: fat, carbohydrate (CHO), CHO, and fat, respectively. We utilized analysis of covariance to compensate for the influence of baseline preference on feeding induced by six experimental procedures: morphine, NPY, NE, 24 and 48 h food deprivation, and chronic dietary restriction. Rats received one of two dietary regimens: three macronutrient diets containing CHO, protein, or fat (regimen I) and two nutritionally complete diets that were high CHO or high fat (regimen II). Baseline preference significantly influenced dietary selection after all six experimental procedures studied in regimen I and after NPY, NE, 48 h food deprivation, and chronic dietary restriction in regimen II (covariate $P < 0.05$). In both dietary regimens, morphine (5 mg/kg) increased consumption of fat, NPY (5 micrograms icv) increased selection of CHO, and consumption of all diets was induced equally after NE injections (20 micrograms icv). After 24 or 48 h food deprivation, animals consumed more fat in regimen I and more CHO diet in regimen II. Restricting food intake by 20% increased fat and protein consumption in regimen I but had no effect in regimen II. Diet

selection is affected by prior preference, feeding stimulus, and type of diet choice presented.

276 NAL Call No.: QL750.A6

Preference for different types of flooring in two rat strains.

Weerd, H. A. v. d.; Broek, F. A. R. v. d.; Baumans, V. *Appl-anim-behav-sci* v.46(3/4): p.251-261. (1996 Jan.)

Includes references.

Descriptors: rats; strain-differences; floor-type; wire-netting; litter; sawdust; wood-shavings; paper; rattus-norvegicus; animal-behavior; animal- welfare

Abstract: Bedding material is a permanent part of the environment of laboratory rodents. In the present study, rats of two strains (Wistar HsdCpb:WU and Brown Norway BN/SsNCpbHsd) were placed in a preference test system to evaluate their preference for three types of bedding material (sawdust, softwood shavings and paper particles) compared to wire mesh. The rats showed a significant preference for the cages with wood shavings and paper bedding, both consisting of large particles. The paper bedding may serve as an alternative to wire mesh floor in some (e.g. toxicological) studies, because of its defined composition. The cages with sawdust and wire mesh floor were relatively avoided. Rats slept in the cages with large-particle bedding, but used the other cages for active behaviour such as eating and defecating; furthermore, many rats preferred different cages during day and night. It is suggested that different behavioural activities may require different cage floor covering.

277 NAL Call No.: QL55.F43-1993

Prevalence of V factor-dependent Pasteurellaceae (Haemophilus) in laboratory rodents and their phenotypic classification.

Nicklas, W.; Benner, A. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 375-377.*

Poster presentation at the symposium.

Descriptors: rats; mice; pasteurellaceae; lungs; trachea; haemophilus-parainfluenzae; mucosa; laboratory-infections; animal-welfare

278 NAL Call No.: SF459.G4B37-1992

The proper care of gerbils.

Barrie, A. Neptune City, NJ : T.F.H. Publications, c1992. 255 p. : col. ill., "TW-106"--Spine.

Descriptors: Gerbils-as-pets

279 NAL Call No.: SF459.G9G87-1992

The proper care of guinea pigs.

Gurney, P. Neptune City, NJ : T.F.H. Publications, [c1992] 256 p. : col. ill., Includes index.

Descriptors: Guinea-pigs-as-pets

280 NAL Call No.: 410-B77

Protecting pups in tests for infanticidal responsiveness in mice, *Mus domesticus*.

Elwood, R. W.; Masterson, D.; O'Neill, C. *Anim-Behav* v.40(pt.4): p.778-780. (1990 Oct.)

Includes references.

Descriptors: mus; pups; mice; male-animals; animal-welfare; strain-differences; aggressive-behavior; protection; culling; infanticide

281 NAL Call No.: QL55.A1L33

Protocol review: Does a fetus feel pain.

Silverman, J. *Lab-anim* v.24(9): p.21-22. (1995 Oct.)

Includes references.

Descriptors: rats; fetus; pain; animal-welfare; animal-experiments

282 NAL Call No.: 442.9-So1

Psychosocial stress, catecholamines, and essential fatty acid metabolism in rats.

Mills, D. E.; Huang, Y. S.; Narce, M.; Poisson, J. P. *Proc-Soc-Exp-Biol-Med* v.205(1): p.56-61. (1994 Jan.)

Includes references.

Descriptors: linoleic-acid; supplements; lipid-metabolism; enzymes; enzyme-activity; epinephrine; stress; hypertension; rats; delta-6-desaturation; delta-5-desaturation; delta-6-desaturase; delta-5-desaturase

Abstract: To examine the effects of psychosocial stress and the "stress hormone," epinephrine, on essential fatty acid metabolism in rats, two studies were conducted. In the first, the effects of four weeks of (i) social isolation and (ii) group housing (control) on liver microsomal delta 6 and delta 5 n-6 desaturase activity were studied in group-reared male normotensive (Wistar Kyoto) and spontaneously hypertensive (SHR) rats (n = 5/group). The second study examined the effects of acute ip epinephrine (0.0, 1.0, 2.0, and 4.0 mg/kg) 6 hr prior to and following an ig dose (4 g/kg) of safflower oil (rich in 18:2n-6, LA) on plasma and liver LA, 20:4n-6 (AA), and LA/AA ratios in adult essential fatty acid deficient Sprague-Dawley rats (n = 6/group). In the first experiment, isolation stress significantly inhibited the activity of delta 6 (P < 0.05) and delta 5 (P < 0.01) desaturase in the normotensive rats and of 45 desaturase in the SHR (P < 0.05). In the second study, epinephrine increased plasma and liver LA at doses 1.0 and 2.0 mg/kg in most of the fractions examined, and suppressed AA levels. The response of the LA/AA ratio to epinephrine varied between tissues and among lipid fractions, but increased this ratio at the moderate doses (2.0-4.0 mg/kg) of epinephrine in most cases. These data suggest that psychosocial stressors are capable of inhibiting the rate limiting steps of essential fatty acid metabolism and that this response is more pronounced in the SHR than in the Wistar Kyoto. They also suggest that epinephrine is capable of altering the in vivo metabolism of essential fatty acids in the rat.

283 NAL Call No.: QL55.F43-1993

Rat and mouse diurnal locomotor activity in home cages.

Stodulski, G.; Sales, G. D.; Saibaba, P.; Hau, J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 345-347.*

Poster presentation at the symposium.

Descriptors: rats; mice; diurnal-activity; cages; animal-welfare; nocturnal-activity; dark; natural-light; artificial-light; capacitance; laboratory- methods

284 NAL Call No.: QL55.F43-1993

Rat carboxylesterase ES-1: biochemical and physiological aspects.

Lith, H. A. v.; Zutphen, B. F. M. v.; Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 424-427.*

Poster presentation at the symposium.

Descriptors: rats; carboxylesterase; enzyme-activity; dietary-fat; maize-oil; cholesterol

285 NAL Call No.: QP141.A1A64

The rat's preference for sucrose, polyose and their mixtures.

Ackroff, K.; Manza, L.; Sclafani, A. *Appetite* v.21(1): p.69-80. (1993 Aug.)

Includes references.

Descriptors: sucrose; sugars; food-preferences; appetite; food-deprivation; satiety; flavor; rats

Abstract: In one-bottle tests (30 min/day) food-deprived rats consumed significantly more 2% Polyose than 2% sucrose, and yet in two-bottle choice tests they did not consistently prefer Polyose to sucrose. A previously proposed explanation for this effect is that rats habituate, or develop oral satiety, to the flavor of sucrose more rapidly than to Polyose, and sucrose satiety generalizes to Polyose. This idea was not supported by the results of sequential 15-min one-bottle tests: the intake of 2% sucrose did not suppress subsequent Polyose intake. Instead, the failure of rats to consistently prefer Polyose to sucrose was attributed to the development of a drinking pattern that allowed the rats to mix the two solutions in their mouths. When the drinking spouts were nearby, the rats consumed similar amounts of sucrose and Polyose, but when the spouts were far apart, they consumed more Polyose than sucrose. That rats prefer the combined flavor of sucrose and Polyose to either flavor alone was confirmed in subsequent tests. Rats strongly preferred a 1 % sucrose + 1 % Polyose mixture to a plain 2% sucrose or 2% Polyose solution. They also preferred sucrose-polyose mixtures to plain solutions at concentrations ranging up to 32%. The potency of the sucrose-polyose mixture is presumably related to the activation of separate "sweet" and "polysaccharide" taste channels in the rat.

286 NAL Call No.: QL55.F43-1993**A rat simulator alternative for education.**

Kurosawa, T.; Usui, T.; Maejima, K. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 495-497.*

Poster presentation at the symposium.

Descriptors: rats; laboratory-workers; training; teaching-materials; animal-models

287 NAL Call No.: SF459.R3H56-1991**Rats : all about selection, husbandry, nutrition, breeding, and diseases, with a special chapter on understanding rats.**

Himsel, C. A. Hauppauge, NY : Barron's, c1991. 72 p. : ill. (some col.), Includes index.

Descriptors: Rats-as-pets

288 NAL Call No.: 100-II64**Rats in space.**

Peterson, D. *Ill-res* v.37(3/4): p.18-22. (1995 Fall-1995 Winter)

Descriptors: rats; animal-housing; flight-cages; design; space-flight; animal-welfare; gravity; animal-husbandry; usa; laboratory-animal-housing; international-space-station; microgravity

289 NAL Call No.: QP141.A1A64**Rats on a macronutrient self-selection diet eat most meals from a single food cup.**

Miller, G. D.; Hrupka, B. J.; Gietzen, D. W.; Rogers, Q. R.; Stern, J. S. *Appetite* v.23(1): p.67-78. (1994 Aug.)

Includes references.

Descriptors: meal-patterns; food-preferences; computers; nutrient-intake; supplements; energy-intake; rats

Abstract: Computerized meal pattern analysis was performed on female Sprague-Dawley rats (n= 10). Rats were housed for 14 days in cages adapted for macronutrient selection. Rats selected their diet from vitamin and mineral supplemented, semi-purified sources of carbohydrate, fat and protein, in three individual food cups. For analysis of meal patterns, minimum meal size was > 50 mg, and mean minimum intermeal interval was 7.9 min. Daily energy intake averaged 289.0 kJ, with 75% occurring during the dark cycle. Energy intake was 28% carbohydrate, 50% fat and 22% protein. Of 12.3 daily meals, 56% were from one, 35% from two, and only 9% of the meals were from three food cups. Seventy percent of the time carbohydrate was the first meal of the dark cycle. The average number of meals per day eaten from carbohydrate, fat, and protein were not significantly different (6.9, 6.2 and 5.6, respectively, $p > 0.05$). Energy intake for a meal was greatest when fat was eaten (18.35 kJ), than when either carbohydrate (8.68 kJ) or protein (8.97 kJ) was eaten. Meal duration was 7.03 min for carbohydrate, 3.75 min for fat, and 7.47 min for protein. These results provide evidence that rats on a macronutrient self-selection diet eat most meals from a single macronutrient source.

290 NAL Call No.: QL55.F43-1993**Rederivation of alcohol-preferring and alcohol-avoiding rats.**

Sarviharju, M.; Jaakkola, U. M. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 501-503.*

Poster presentation at the symposium.

Descriptors: rats; embryo-transfer; ethanol; line-differences

291 NAL Call No.: Z7994.L3A5**Reduction in animal use 35 years after Russell & Burch's Principles of Humane Experimental Technique.**

Festing, M. F. W. *ATLA, -Altern-lab-anim* v.23(1): p.51-60. (1995 Jan.-1995 Feb.)

Includes references.

Descriptors: animal-experiments; experimental-design; animal-welfare; variation; inbred-strains; germfree-animals

Abstract: "Reduction" in animal use can be achieved by better experimental strategy and improved experimental design. In 1959, one strategy for discovering new drugs involved the random testing of thousands of chemicals in animal models of disease. This strategy was deplored by Russell & Burch in *The Principles of Humane Experimental Technique* (1959) as being inefficient and inhumane, and has now been almost completely superseded, following fundamental research resulting

in an improved understanding of the mechanisms of drug action. Random screening is still done on a large scale, but by using in vitro methods. Good experimental design involves the control of variation. In 1959, it was not clear whether isogenic (inbred or F1 hybrid) strains of mice and rats were more uniform than outbred stocks and whether they should therefore be used preferentially in bioassays. It is now generally accepted that F1 hybrids and inbred strains tend to be more uniform, but, as precision also depends on sensitivity, which is unpredictable, there is no general rule for choosing the best strain for a bioassay. Choice should be based on pilot studies. However, the use of more-uniform specific pathogen-free animals, which were only just becoming available in 1959, has certainly reduced the number of animals which are used. Other aspects of experimental design, such as the need to avoid bias, have a wide range of applicability; the importance of simplicity and the ability to calculate uncertainty are, apparently, not always appreciated by research scientists. The concept of "reduction" has been useful in focusing attention on the need for improved experimental design. In the long-run, animal. but also in the way in which experiments are planned and analysed.

292 NAL Call No.: 447.8-AM3

Renal adaptation to low-phosphate diet in diabetic rats.

Abraham, M. I.; Woods, R. E.; Breedlove, D. K.; Kempson, S. A. *Am-J-Physiol* v.262(5,pt.2): p.F731-F736. (1992 May)
Includes references.

Descriptors: experimental-diabetes; inorganic-phosphorus; diet; mineral-deficiencies; nutrient-transport; sodium; proline; insulin; renal-function; vesicles; kidneys; blood-plasma; brush-border-membrane-vesicles; proximal-tubules

Abstract: Insulin stimulates the Na⁺-Pi cotransport system in the brush-border membrane (BBM) of the renal proximal tubule, and an acute decrease in plasma insulin leads to a decrease in renal reabsorption of Pi. It has been proposed that insulin may play a role in the rapid renal adaptation to dietary deprivation of Pi. This hypothesis was tested using rats with low plasma insulin due to streptozotocin-induced diabetes. Both control and diabetic rats were housed in metabolic cages and fed either a normal Pi diet or a low Pi diet for 3 days. At the end of the third day, BBM vesicles were prepared from renal cortex and Na⁺-Pi cotransport was measured. At the whole kidney level, diabetic rats showed a normal adaptive response. There was a prompt and marked decrease in urinary Pi excretion when the rats ate a low Pi diet. At the BBM level, however, the adaptive response was absent. There was no increase in Na⁺-Pi cotransport in diabetic rats fed low Pi diet. Treatment of diabetic rats with exogenous insulin before feeding low Pi diet restored the adaptive increase in Pi transport by BBM. Insulin appears to be required for the adaptation of proximal tubule Pi transport to low Pi diet. In the absence of this adaptation in proximal tubule BBM, a compensatory response in the kidney may produce an increase in Pi reabsorption in later segments of the nephron.

293 NAL Call No.: 410-B77

Reorganization of behaviour in laboratory mice, *Mus musculus*, with varying cost of access to resources.

Sherwin, C. M.; Nicol, C. J. *Anim-behav* v.51(pt. 5): p.1087-1093. (1996 May)

Includes references.

Descriptors: mice; cages; energy-cost-of-activities; animal-behavior; physical-activity; time-allocation; animal-welfare

Abstract: Gaining access to resources can be measured in terms of the time spent with, or the number of visits to, a resource. For some resources, time spent with the resource might be more important, for others the number of visits might be more meaningful. By using traverses of shallow water, the costs of gaining access to food, shelter, a conspecific, increased space, a running wheel, deep sawdust, or enrichments (e.g. balls, a variety of small objects) were increased for laboratory mice. When 30 cm of water was present, the number of visits to each resource decreased to 39-64% of the number recorded when no water was present, but the proportion of time spent with each resource was defended. Increasing the width of water to 120cm had no further effect on the number of visits or on the proportion of time spent with each resource: thus both the frequency of visits and the proportion of time with each resource were ultimately defended. Possible reasons for this change in behavioural organization, including the importance of patrolling, are discussed. The data support previous findings that laboratory mice are highly motivated to patrol areas made accessible to them, and suggest that care is needed when interpreting what animals perceive as reinforcement during visits to resources. Furthermore, it was shown that for laboratory mice under conditions that penalize initial access only, the time spent with a wide variety of resources was defended more diligently than the number of visits, but the number of visits was rarely allowed to decrease to zero.

294 NAL Call No.: DISS--F1994435

Reproductivity and morphometrical data of chinese hamsters (*Cricetulus griseus*) with respect to different conditions of breeding and housing. Reproduktionsleistungen und morphometrische Daten von Chinesischen Hamstern

(Cricetus griseus) unter dem Aspekt verschiedener Zucht- und Haltungsbedingungen.

Hanke, A. Hannover : [s.n.], 1994. 196 p. : ill., Thesis (doctoral)--Tierärztliche Hochschule Hannover, 1994.

295 NAL Call No.: 41.2-H198-1990-[no.38]

Reproductivity and morphometrical data of Syrian Golden Hamsters (*Mesocricetus auratus*, Waterhouse) with respect to different conditions of breeding and housing. Reproduktionsleistungen und morphometrische Daten von Syrischen Goldhamstern (*Mesocricetus auratus*, Waterhouse) unter dem Aspekt verschiedener Zucht- und Haltungsbedingungen. Reproduktionsleistungen und morphometrische Daten von Syrischen Goldhamstern (*Mesocricetus auratus*, Waterhouse) unter dem Aspekt verschiedener Zucht- und Haltungsbedingungen.

Carballo, O. Hannover : [s.n.], 1990. 89 p. : ill., English summary.

296 NAL Call No.: SF407.R6R63-1994

Requests for changes in USDA regulations.

Stephens, M. L. *Rodents and rabbits current research issues proceedings of a conference sponsored by SCAW and WARDS held in Washington, DC on May 21, 1993* / p.3-12. (1994)

Descriptors: animal-welfare; regulations; usda; organizations; legislation; mice; rats; usa; humane-society-of-the-united-states; animal-welfare-act

297 NAL Call No.: QL55.I5

The rest/activity rhythm of the laboratory rat housed under different systems.

Batchelor, G. R. *Anim-technol* v.45(3): p.181-187. (1994 Dec.)

Includes references.

Descriptors: rats; cages; enrichment; rest; sleep; diurnal-activity; nocturnal-activity

Abstract: The activity of laboratory rats housed in conventional polypropylene boxes, with and without enrichment and in a single and double commune box with enrichment was recorded every 15 minutes to determine the peak activity periods, the degree of nocturnality and the effect of different housing systems and enrichment on the 24 hour rest/activity cycle. Rats were housed in four different environments and each housing situation was recorded for four 12 hour periods in total. The number of animals either active or resting/asleep at each timepoint was recorded. Rats are, as is well known, generally nocturnal and this was borne out by the results obtained for all housing situations. The mean activity during the hours of darkness for all housing situations was in the region of 50%, while during the day this was reduced to between 14 - 19%. No matter what housing system and enrichment are used these figures will remain fairly constant, in fact in enriched environments resting and sleep may actually increase, compared to unenriched conditions. The behaviour of laboratory rats may be enhanced qualitatively in an enriched environment, that is, in richness and diversity, but the actual amount of time the rats spend awake may actually be reduced.

298 NAL Call No.: 410.9-P94

A restraint for ophthalmic examination of unanesthetized rats.

Anderson, G. W. Jr.; Lawrence, W. B.; Lee, J. O.; Young, M. *Lab-Anim-Sci* v.41(3): p.288-290. (1991 June)

Includes references.

Descriptors: rats; restraint-of-animals; laboratory-equipment; restraint-devices

299 NAL Call No.: 410.9-P94

Retinal cyclic light damage threshold for albino rats.

Semple Rowland, S. L.; Dawson, W. W. *Lab-Anim-Sci* v.37(3): p.289-298. ill. (1987 June)

Includes references.

Descriptors: rats; cages; lighting; light-intensity; retinas; damage

300 NAL Call No.: QL55.A1L3

Ringtail in the pouched mouse (*Saccostomus campestris*).

Ellison, G. T. H.; Westlin Van Aarde, L. M. *Lab-anim* v.24(3): p.205-206. (1990 July)

Includes references.

Descriptors: mice; tail; animal-diseases; relative-humidity

Abstract: Laboratory colonies of the pouched mouse (*Saccostomus campestris*) were housed in solid bottom cages and fed a

varied diet containing excess fatty acids. Ringtail was only initiated in animals of all ages, from populations originating from different areas of South Africa, when the relative humidity fell below 30%. The incidence of ringtail was curtailed by maintaining relative humidity above 45% in animal houses.

301 NAL Call No.: 448.8-J8293

Role of LHRH in the gonadotrophin response to restraint stress in intact male rats.

Lopez Calderon, A.; Gonzalez Quijano, M. I.; Tresguerres, J. A. F.; Ariznavarreta, C. *J-Endocrinol* v.124(2): p.241-246. (1990 Feb.)

Includes references.

Descriptors: rats; gonadotropin-releasing-hormone; male-animals; stress-factors

302 NAL Call No.: 410-B77

The role of substrate odours in maintaining social tolerance between male house mice, *Mus musculus domesticus*.

Hurst, J. L.; Fang, J.; Barnard, C. J. *Anim-Behav* v.45(pt.5): p.997-1006. (1993 May)

Includes references.

Descriptors: mus-musculus; odors; social-behavior

Abstract: Odours deposited on home substrate by male house mice were manipulated experimentally to test whether cues deposited by subordinates help to maintain social tolerance between familiar mice living in the same social group. Groups of three unrelated wild-stock males were housed together from weaning until adult. Mice were then housed individually on substrate soiled by fellow group members, but allowed to interact with group members for 1 h/day over a 5-day period; this simulated the situation in free-living populations where mice may meet only occasionally but are in continuous contact with shared group substrate odours. In control groups, substrate from the individual cages of all three group members was mixed together daily to maintain their contact with fresh group odour cues. In experimental groups, substrate from one of the two subordinates in each triad was not added to the cages of fellow group members after day 2 to simulate his dispersal from their group; this Dispersed subordinate continued to receive fresh cues from fellow group members each day. Both the dominant male and Resident subordinate showed significantly increased aggression towards the Dispersed subordinate but not towards the other member of their group after the Dispersed male stopped contributing fresh cues to their home cage substrate. Results thus suggest that subordinate male substrate odours are important cues for maintaining the individual recognition of tolerated group members by both dominant and subordinate males. The adaptive significance of the characteristically restricted pattern of substrate marking by subordinate male mice is discussed.

303 NAL Call No.: QL55.A1L33

A safe and easy way to pick up B6C3F1 mice from wire-bottom cages.

Quezada, A. *Lab-anim* v.23(7): p.53. (1994 July-1994 Aug.)

Descriptors: mice; handling

304 NAL Call No.: 410.9-P94

Sedative efficacy of droperidol and diazepam in the rat.

Quinn, R. H.; Danneman, P. J.; Dysko, R. C. *Lab-anim-sci* v.44(2): p.166-171. (1994 Apr.)

Includes references.

Descriptors: rats; anesthesia; droperidol; diazepam; dosage; efficacy; animal-welfare; restraint-of-animals; laboratory-methods; diagnostic- techniques; pain; tail-vein-bleeching; orbital-bleeding; teeth-clipping; toenail-bleeding

Abstract: Droperidol and diazepam were evaluated for sedative properties in 12 male Sprague Dawley rats (*Rattus norvegicus*). Over a period of several weeks, each rat was treated subcutaneously with 0.5 mg droperidol/kg, 2.0 mg droperidol/kg, 5.0 mg diazepam/kg, 15.0 mg diazepam/kg, and physiologic saline according to a randomized schedule. After each treatment, the animals were evaluated for their response to a series of four common clinical manipulations (tail-vein bleeding, orbital bleeding, teeth clipping, and toenail bleeding) at five time points over the 90 min following the injection. Rats were scored on the basis of their responses to each manipulation. Response to cardiac puncture was assessed once in each animal immediately prior to euthanasia. Histologic lesions associated with subcutaneous and intramuscular administration of these drugs were evaluated in a separate group of animals. Results indicate that both droperidol and diazepam (at either dose) allow easier manipulation for toenail bleeding and teeth clipping when compared with saline control. There was no advantage in using these sedatives for tailvein bleeding. Orbital bleeding could not be performed humanely with either drug. Diazepam at a dose of 15.0 mg/kg allowed humane cardiac puncture. Subcutaneous injection of

diazepam or 2.0 mg droperidol/kg resulted in various degrees of inflammation revealed by histologic examination, although no clinical signs were associated with these lesions. Subcutaneous administration of droperidol at a dose of 0.5 mg/kg is recommended for nonpainful, noninvasive manipulations as it provides adequate sedation for most procedures without inducing the subcutaneous. general anesthesia for cardiac puncture.

305 NAL Call No.: QP141.A1P46

Selected criteria for peptides as regulators of feeding: an overview.

Levine, A. S.; Billington, C. J. *Pennington-Cent-Nutr-Ser. Baton Rouge : Louisiana State University Press. 1992. v. 2 p. 210-223.*

Literature review.

Descriptors: feeding-behavior; peptides; food-intake; regulation; pancreozymin; literature-reviews

Abstract: Over twenty regulatory peptides have been reported to either decrease or increase food intake in laboratory animals. However, whether such peptides are involved in natural hunger and satiety is unclear. We suggest the following criteria for a peptide to qualify as a regulator of normal feeding behavior: 1) The peptide increases or decreases food intake in the home environment. 2) The decrease in intake occurs during the normal feeding cycle, and the behavioral sequence resembles normal satiety. Likewise, an increase in feeding results in a behavioral sequence similar to normal feeding or that seen after food deprivation. 3) The locus of action of the peptide is a site where the peptide is known to be endogenously released and where the receptor for that peptide has been observed. 4) A receptor antagonist, if available, results in the opposite effect of that observed after administration of the peptide. 5) By under- or overfeeding rats an appropriate change in the endogenous status of the peptide, receptor, or messenger RNA for these proteins occurs at the relevant brain site. 6) An increase in feeding is seen even under circumstances in which the rat must work to obtain food. Peptides that reduce normal feeding decrease food-reinforced responding. 7) A peptide-induced change in feeding behavior is not due to a direct effect on an alternative behavior. Currently, cholecystokinin and neuropeptide Y are the peptides that best fit these criteria as regulators of normal feeding.

306 NAL Call No.: 49-J82

Serum cholesterol concentration of mice selected for litter size and its relationship to litter size and testis mass.

Ribeiro, E. L. d. A.; Kittok, R. J.; Nielsen, M. K. *J-anim-sci* v.72(11): p.2943-2947. (1994 Nov.)

Includes references.

Descriptors: mice; blood-serum; cholesterol; litter-size; selection-responses; selection-criteria; testes; weight; body-weight; sex-differences

Abstract: This study assessed the genetic relationship between litter size and serum cholesterol concentration and between litter size and testis mass in mice. Mice were from a long-term experiment in which selection had occurred for 21 generations in three replicated lines per criterion of selection (LS = selection to increase litter size based on number born; LC = unselected control). Thereafter, random mating within lines was practiced. Serum cholesterol concentrations were evaluated in female and male mice from two replicates at Generation 29 and one replicate at Generation 30. Body weights and blood samples were collected from primiparous females 8 d after weaning their pups. Data from males were collected as they came out of breeding cages. In addition, the testes were excised, stripped clean of connective tissue and the epididymides, and weighed. Means for body mass of females and males, serum cholesterol, number born, and testis mass were as follows: 35.2 vs 32.5 g ($P < .09$), 33.9 vs 30.7 g ($P < .08$), 117.5 vs 110.5 mg/dL ($P < .08$), 14.0 vs 10.3 pups ($P < .04$), and 126 vs 122 mg, respectively, for LS and LC. Serum cholesterol was greater in males than in females (133.3 vs 95.1 mg/dL; $P < .001$), but there was no interaction between sex and selection criterion. Serum cholesterol concentration was not correlated phenotypically to number born or body mass, but it had a small negative relationship with testis mass. Therefore, we concluded that selection for litter size tended to increase serum cholesterol in addition to the increase in number born but did not change testis mass.

307 NAL Call No.: 442.9-So1

Serum prolactin response to ether stress in diabetic rats: opiate system contribution.

Yogev, L.; Yavetz, H.; Gottreich, A.; Oppenheim, D.; Homonnai, Z. T.; Paz, G. *Proc-Soc-Exp-Biol-Med* v.205(3): p.248-252. (1994 Mar.)

Includes references.

Descriptors: experimental-diabetes; stress; prolactin; hormone-secretion; opioids; receptors; naltrexone; rats; chronic-stress; acute-stress

Abstract: Diabetes in streptozotocin-treated rats is associated with alterations in various neuroendocrine systems, including endogenous opioids. These changes are suggested to be responsible for the significant reduction in serum prolactin (PRL) response to a brief restraint stress in diabetic male rats, as compared with normoglycemic controls. The present study examines serum PRL response to ether stress in diabetic male rats. The animals' response to ether stress, which is known to be related to the opioid system, was examined twice in each rat: shortly after cannula insertion (Day 1), and seven days later. In order to evaluate the opiate system involvement, the experiment was repeated on Day 1 and 7 after surgery in a group of rats which were pretreated with naltrexone (Nalt), an opioid receptor antagonist. Opioid receptor sensitization was also performed by prior acute morphine administration on Day 7 after cannulation surgery. Following adaptation to the cannulation, no difference in serum PRL response to ether stress was found between diabetic and normoglycemic rats. However, on Day 1 after surgery, a significant difference was found between the diabetic and control groups: the normoglycemic (control) group exposed to ether responded to the surgical stress by augmented serum PRL levels. This response was not recorded in the diabetic rats. Opioid receptor blockade by Nalt administration 30 min before ether exposure eliminated this difference. Opioid receptor sensitization by morphine pretreatment facilitated PRL secretion in normoglycemic rats exposed to ether, while no effect could be distinguished in the diabetic group. It is therefore concluded that the streptozotocin-induced diabetic rats do not, exposure under additional surgical stress, or by presensitization of the opioid receptors by morphine, is prevented in diabetic rats, probably due to diminished opioid receptor response.

308 NAL Call No.: 447.8-Am3

Skeletal and cardiac muscle protein turnover during short-term cold exposure and rewarming in young rats.

Samuels, S. E.; Thompson, J. R.; Christopherson, R. J. *Am-j-physiol* v.270(6,pt.2): p.R1231-R1239. (1996 June)

Includes references.

Descriptors: protein-turnover; protein-synthesis; protein-degradation; environmental-temperature; cold; exposure; recovery; food-intake; myocardium; skeletal-muscle; young-animals; rats

Abstract: Young animals exposed to cold environmental temperatures typically have decreased skeletal muscle accretion but increased heart masses. To explore these phenomena, we measured protein synthesis and degradation in vivo in cardiac and skeletal muscle in weanling rats during short-term cold exposure and rewarming. Control rats were housed at 25 degrees C throughout the experiment. Ad libitum-fed and pair-fed (to the intake of controls) rats were housed at 5 degrees (cold) for 5 days and then at 25 degrees C (rewarmed) for another 5 days. Cold exposure decreased rates of protein accretion and synthesis in skeletal muscle, whereas degradation did not differ. The effects of cold exposure on skeletal muscle were similar in both pair-fed and ad libitum-fed rats, except growth was lower in pair-fed rats. In cardiac muscle, cold exposure increased rates of protein synthesis and degradation and resulted in increased cardiac mass. Results in pair-fed animals generally fell between those of control and ad libitum-fed cold rats. During rewarming, growth rates were not higher in skeletal muscle in ad libitum-fed rewarmed rats, although protein turnover returned toward control values; in pair-fed rats, it remained lower. In heart, growth rates of ad libitum-fed and pair-fed rewarmed rats decreased due to lower protein synthesis rates. These alterations appear to be consistent with a strategy designed to improve survival in cold environments.

309 NAL Call No.: QL55.F43-1993

Social behaviour after intraperitoneal injection--a comparison with the disturbance index method.

Clausing, P.; Reum, K.; Bruckner, R. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 73-76.*

Includes references.

Descriptors: mice; stress-response; intraperitoneal-injection; social-behavior; physical-activity; animal-welfare; social-dominance

310 NAL Call No.: 410-B77

Social odours, hormone modulation and resistance to disease in male laboratory mice, *Mus musculus*.

Smith, F. V.; Barnard, C. J.; Behnke, J. M. *Anim-behav* v.52(pt.1): p.141-153. (1996 July)

Includes references.

Descriptors: mice; odors; sawdust; immunological-deficiency; babesia-microti; babesiosis; igg; disease-resistance; testosterone; blood-serum; corticosterone; social-dominance; parasitemia

Abstract: Isolated adult male C57BL/6 mice were exposed in their home cage to the odours of unfamiliar males and females. Their immunocompetence and resistance to subsequent experimental infection with *Babesia microti* were lower than those

of control animals. Males that had held high social rank in previously established groups had a more severe infection than those that had been low rankers. The reduction in resistance among high rankers was most pronounced when female odours were combined with the odours of another male. Analysis of changing serum hormone concentrations over the period of exposure to odours suggested that hormone-related resistance reflected the degree of modulation of immunodepressive hormones in relation to current immune status. The results are interpreted in terms of adaptive trade-offs between immune function and competing metabolic demands.

311 NAL Call No.: QD501.M63

Splanchnic amino acid pattern in genetic and dietary obesity in the rat.

Herrero, M. C.; Remesar, X.; Arola, L.; Blade, C. *Mol-cell-biochem* v.139(1): p.11-19. (1994 Oct.)

Includes references.

Descriptors: obesity; amino-acid-metabolism; nutrient-uptake; diet; genetic-defects; starvation; feeding; liver; rats; genetic-obesity

Abstract: The study of intestinal and hepatic uptake of amino acids by obese rats has been the main objective of this work. The obese animals used were either from genetic or from nutritional basis. In fed state, the intestinal release of amino acids was higher in obese animals than in lean ones (around the double values), but nutritionally and genetically obese rat showed a related pattern, specially for the case of alanine (increased release in relation to controls by a factor of 10). The higher alanine release by intestine is not reversed by 12-h food deprivation. The hepatic availability was also higher in obesity models than in lean animals (increases over 30%). However, the hepatic uptake was increased in genetically obese animals (more than 35%) and decreased in nutritionally obese animals (more than 40%), especially due to alanine uptake (2419, 1100 and 3794 nmols/min/g protein in lean, Diet-ob and fa/fa animals respectively). In obese animals the food deprivation tended to normalize the hepatic uptake of alanine. The differences in alanine uptake between both types of obesity may reflect the differences of urea synthesis.

312 NAL Call No.: RC628.A102

Splanchnic ammonia management in genetic and dietary obesity in the rat.

Herrero, M. C.; Angles, N.; Remesar, X.; Arola, L.; Blade, C. *Int-j-obes-relat-metab-disord* v.18(4): p.255-261. (1994 Apr.)

Includes references.

Descriptors: diet; obesity; ammonia; genetics; rats

Abstract: Three groups of 60-day-old Zucker rats: lean (Fa/Fa), obese by diet (Fa/Fa diet-obese) and genetically-obese (fa/fa) were fed ad libitum in order to study their splanchnic ammonia management. The study was also performed in 12h food-deprived diet-obese and lean rats, to exclude a possible effect of diet composition on the parameters studied. Ammonia concentration was higher in the hepatic, portal and arterial plasma of diet-obese rats. The intestine did not contribute to a rise in the blood ammonia levels. This increase of ammonia in the blood of diet-obese rats coincides with higher alanine levels in plasma and a net glutamine production by liver. In fa/fa rats, ammonia levels were similar to those of lean rats, except for portal ammonia, which was lower. Hepatic availability of ammonia increased dramatically in diet-obese rats, but ammonia uptake by the liver was similar to that of lean rats. Conversely, hepatic availability of ammonia in fa/fa rats was similar to that of lean animals, whereas ammonia uptake by the liver was reduced to 50% of either lean or diet-obese values. Fasting for 12 h reduced plasma ammonia concentration in diet-obese rats: ammonia levels in the hepatic vein and aorta were similar to those of lean rats fasted for 12h, whereas they were lower in the portal vein. Furthermore, ammonia hepatic availability was in the same range as that of lean animals, whereas ammonia uptake by the liver was reduced. From these results, it can be deduced that diet-obese rats fasted for 12 h show similar behaviour to that of fa/fa rats feeding ad libitum. Fractional extraction of ammonia by liver of diet-obese rats (ad libitum or 12 h fasted) and fa/fa rats. greater than in lean animals.

313 NAL Call No.: 410.9-P94

Spontaneous and experimental infections in scid and scid/beige mice.

Percy, D. H.; Barta, J. R. *Lab-Anim-Sci* v.43(2): p.127-132. (1993 Apr.)

Paper presented at a conference entitled "The Scid Mouse in Biomedical and Agricultural Research," August 5-7, 1992, Guelph, Canada.

Descriptors: mice; mutants; infections

Abstract: Severe combined immunodeficient (scid) mice are valuable animals to study a variety of logic and disease

processes. Their capacity to support multiple tissue xenografts permits these mice to be used as intermediate models for host-specific, fastidious organisms for which a small animal model has not been available previously. However, because they are unable to mount a normal immune response, they are very susceptible to a variety of primary and opportunistic microbial pathogens. Fatal, naturally occurring infections with bacteria such as *Proteus mirabilis*, *Streptococcus viridans*, and *Escherichia coli* have been observed. In addition, based on observations after experimental or naturally occurring viral infections, scid and scid/beige mice have been shown to be very susceptible to infections with viruses such as mouse hepatitis virus, Sendai virus, and murine respiratory virus, with resulting mortality. Of the parasitic infections, *Pneumocystis carinii* is a relatively common contaminant of the respiratory tracts of scid mice and may complicate research projects, particularly experimental respiratory tract infections. In view of the enhanced susceptibility of these mice to infections of this type, it is essential that they be housed under optimal conditions, which include implementing stringent management practices and a functional barrier system.

314 NAL Call No.: 410.9-P94

Streptobacillus moniliformis epizootic in barrier-maintained C57BL/6J mice and susceptibility to infection of different strains of mice.

Wullenweber, M.; Kaspareit Rittinghausen, J.; Farouq, M. *Lab-Anim-Sci* v.40(6): p.608-612. (1990 Nov.)

Includes references.

Descriptors: mice; streptobacillus; strain-differences; susceptibility; outbreaks; genetic-resistance

Abstract: We report a *Streptobacillus moniliformis* epizootic in barrier-maintained SPF mice. Although various inbred and F1 hybrid strains of mice have been kept in this animal facility, only Han:C57BL/6J mice showed clinical signs of disease. During the course of the epizootic, 825 breeding animals (approximately 36% of the breeders) died or had to be killed because of severe clinical signs. Although sequential treatment with ampicillin and chlortetracycline gave good therapeutic results, the animal facility was vacated in order to exclude any risk of cross-contamination of the other rodent colonies in our institute. The source and route of transmission of *S moniliformis* could not be elucidated. To investigate strain dependent differences experimental infection of different strains of mice with our *S moniliformis* isolate was performed. After oral infection only C57BL/6J showed the typical signs of a cervical lymphadenitis and gave an immunological response. BALB/cJ, C3H/He, DBA/2J, CB6F1 and B6D2F1 mice were not affected except in two cases of DBA/2J and B6D2F1 mice where seroconversion was observed. After intravenous infection of C57BL/6J, DBA/2J and BALB/cJ all animals showed positive titers in the indirect immunofluorescence test (IIF). One hundred percent of the C57BL/6J, forty percent of the DBA/2J, and none of the BALB/cJ mice developed severe symptoms. The results demonstrate that the susceptibility to streptobacillosis is predominantly influenced by genetic factors.

315 NAL Call No.: QL55.A1L3

Stress management in mice after transportation.

Tuli, J. S.; Smith, J. A.; Morton, D. B. *Lab-anim* v.29(2): p.132-138. (1995 Apr.)

Includes references.

Descriptors: mice; stress; transport-of-animals; acclimatization; time; corticosterone; animal-housing; animal-behavior; group-housing; individual-housing

Abstract: Experiments were performed using physiological measures and behavioural parameters to find the acclimatization period in mice to common scientific procedures. Corticosterone levels were significantly elevated in mice killed immediately after being moved to an experimental room ($P < 0.05$) but levels returned to the normal in less than 1 day, despite mice being exposed to additional stressors such as novel environment, new cages, new bedding material, separation from their cage mates, regrouping, isolation in individually housed mice and a new handler. Behaviours such as rearing, climbing, grooming, feeding and sexual, changed significantly immediately after transportation of mice but most of these behaviours stabilized relatively quickly. In spite of the corticosterone levels, our behavioural observations suggest that even 4 days were not enough to allow the mice to acclimatize fully.

316 NAL Call No.: QL55.F43-1993

Stress perception of surgical anaesthesia in rats.

O'Brien, D.; Opi, P. T.; Stodulski, G.; Saibaba, P.; Hau, J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 24-27.*

Includes references.

Descriptors: rats; stress-response; urine; corticosterone; testosterone; animal-welfare; inhaled-anesthetics; injectable-anesthetics

317 NAL Call No.: QL55.F43-1993

Studies on the feasibility of developing an alternative in vitro method for the haemoglobin regeneration bioassay.

Wienk, K. J. H.; Lemmens, A. G.; Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 440-442.*

Poster presentation at the symposium.

Descriptors: rats; bioassays; hemoglobin-value; bioavailability; animal-testing-alternatives; iron; solubility; feed-intake; water-intake; calcium- carbonate; digesta

318 NAL Call No.: QL55.F43-1993

Sucrose in purified diets of rats may induce nephrocalcinosis despite simulation of magnesium absorption.

Heijden, A. v. d.; Berg, G. J. v. d.; Bergstra, A. E.; Lemmens, A. G.; Beynen, A. C. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 475-477.*

Poster presentation at the symposium.

Descriptors: rats; sucrose; nephrocalcinosis; magnesium; fructose; mineral-absorption; digesta; ileum

319 NAL Call No.: 410.9-P94

A survey of Pneumocystis carinii infection in research mouse colonies in Japan.

Serikawa, T.; Kitada, K.; Muraguchi, T.; Yamada, J. *Lab-Anim-Sci* v.41(5): p.411-414. (1991 Oct.)

Includes references.

Descriptors: mice; pneumocystis-carinii; disease-prevalence; disease-surveys; laboratories; germfree-animals; japan

Abstract: To determine the frequency of *Pneumocystis carinii* infection in mouse colonies maintained for biomedical research in medical colleges or medical faculties in universities in Japan, 409 nu/nu mice were sent to 43 animal facilities from a *P. carinii*-free colony. The animals were housed for 6 months in groups of 3 to 10 animals per room, and examined for the presence of parasites and infection. Colonies in 10 (24.4%) of 41 facilities were positive for the infection. Of 383 animals in 69 rooms, the organism was detected in 66 (17.2%) animals in 13 (18.8%) rooms. The difference in the proportion of rooms where mice were positive for *P. carinii* is clearly seen among these three groups; SPF mouse rooms (4 of 38 rooms, 10.5%), SPF mouse rooms with breeding units (5 of 25 rooms, 20.0%) and conventional mouse rooms (4 of 6 rooms, 66.7%). The survey indicates that strict housing arrangements and husbandry techniques are necessary to keep SPF mice free from *P. carinii* infection.

320 NAL Call No.: SF459.H3P54-1992

Taking care of your hamster.

Piers, H.; Vriends Parent, L. Hauppauge, NY : Barron's, 1992. 32 p. : col. ill., Includes bibliographical references (p. 31) and index.

Descriptors: Golden-hamsters-as-pets

321 NAL Call No.: 410.9-P94

Technique for creating a permanent cecal fistula in the rat.

Kloots, W. J.; Amelsvoort, J. M. M. v.; Brink, E. J.; Ritskes, J.; Remie, R. *Lab-anim-sci* v.45(5): p.588-591. (1995 Oct.)

Includes references.

Descriptors: rats; cecum; cannulae; variation; fistulation; surgery

Abstract: A method was developed to surgically implant a silicone/stainless steel fistula-cannula in the cecum of freely moving rats. The specially designed fistula-cannula allows sampling of cecal contents at any time without disturbing the physiologic functions of the intestinal tract, as evaluated by observation of general well-being and postmortem macroscopic inspection. The fistula-cannula was implanted in 12 male rats under general anesthesia. The animals remained in good health during the postoperative period lasting up to 9 weeks. They gained weight normally compared with a control group (n = 8) that had not undergone surgery. Samples of 0.2 to 1.0 g of contents could be collected with a microspatula, without the

need to anesthetize the animal. The model provides a useful system for sampling cecal contents without the need to sacrifice the animal. Because it allows cross-over studies to be carried out, this approach may result in significantly reducing the number of animals required for digestive studies.

322 NAL Call No.: QL55.A1L3

A third component causing random variability beside environment and genotype. A reason for the limited success of a 30 year long effort to standardize laboratory animals.

Gartner, K. *Lab-Anim* v.24(1): p.71-77. (1990 Jan.)

Includes references.

Descriptors: rats; mice; quantitative-traits; variation; environmental-factors; genetic-variation; body-weight; variance-components

Abstract: This paper is a review of experiments, performed in our laboratory during the past 20 years, designed to analyse the significance of different components of random variability in quantitative traits in laboratory rats and mice. Reduction of genetic variability by using inbred strains and reduction of environmental variability by highly standardized husbandry in laboratory animals did not remarkably reduce the range of random variability in quantitative biological traits. Neither did a tremendous increase of the environmental variability (i.e., living in a natural setting) increase it. Therefore, the postnatal environment cannot be that important as the source of random variability. Utilizing methods established in twin research, only 20-30% of the range of the body weight in inbred mice were directly estimated to be of environmental origin. The remaining 70-80% were due to a third component creating biological random variability, in addition to the genetic and environmental influences. This third component is effective at or before fertilization and may originate from ooplasmic differences. It is the most important component of the phenotypic random variability, fixing its range and dominating the genetic and the environmental component. The Gaussian distribution of the body weights observed, even in inbred animals, seems to be an arrangement supporting natural selection rather than the consequence of heterogeneous environmental influences. In a group of inbred rats, the males with the highest chance of parenting the next generation were gathered in the central classes of the distribution of the body weight.

323 NAL Call No.: Z7994.L3A5

The third R: refinement.

Rowan, A. N. *ATLA,-Altern-lab-anim* v.23(3): p.332-346. (1995 May-1995 June)

Includes references.

Descriptors: animal-experiments; pain; anxiety; stress-factors; animal-welfare; mice; inflammation; distress

Abstract: This review attempts to provide an introduction to the complicated subject of refinement, the third R in the concept of alternatives. It starts with a brief discussion of what refinement means and the lack of specific attention paid to this third R. This is followed by an analysis of the conceptual underpinnings of pain, distress and suffering, and the problems of both definition and measurement which must be faced if we are to be objective and consistent in our search for refinement. The review then touches upon husbandry, care and handling issues as they affect animal discomfort and distress. Antibody production, both polyclonal and monoclonal, is discussed as an example of the refinement of research techniques. Finally, a few brief comments are offered on the refinement of a variety of other experimental techniques, including those used in toxicology, cancer research and behavioural research.

324 NAL Call No.: 389.8-J82

Threshold for glucose-stimulated insulin secretion in pancreatic islets of genetically obese (ob/ob) mice is abnormally low.

Chen, N. G.; Tassava, T. M.; Romsos, D. R. *J-nutr* v.123(9): p.1567-1574. (1993 Sept.)

Includes references.

Descriptors: obesity; insulin; secretion; glucose; pancreas-islets; food-restriction; acetylcholine; phenotypes

Abstract: Pancreatic islets were isolated from 8-9-wk-old female genetically obese (ob/ob) and lean mice to determine the glucose threshold for insulin secretion, and to examine effects of acetylcholine on insulin secretion. Only equal-sized islets from ob/ob and lean mice were incubated to eliminate confounding effects of phenotypic differences in islet size. Even after this adjustment, islets from ob/ob mice still hypersecreted insulin in response to 20 mmol/L glucose. The threshold for glucose-induced insulin secretion determined by perfusing islets with a linear glucose gradient averaged 1.9 +/- 0.1 mmol/L glucose in fed ob/ob mice and 3.1 +/- 0.1 mmol/L glucose in ob/ob mice after 24 h of food deprivation. These low

thresholds indicate that islets from ob/ob mice are constantly stimulated by glucose. Islets from lean mice exhibited considerably higher thresholds (4.8 +/- 0.1 and 7.1 +/- 0.1 mmol/L glucose in fed and 24-h food-deprived lean mice, respectively). Rates of insulin secretion per each unit (mmol/L) increase in glucose above threshold concentrations were unaffected by phenotype or feeding state. Addition of acetylcholine to the perfusing buffer further lowered the threshold for insulin secretion to 0.5 mmol/L glucose in pancreatic islets from ob/ob mice and also doubled the rate of increase in insulin secretion at glucose concentrations above the threshold. The combination of the very low threshold for glucose-induced insulin secretion and the exaggerated insulin secretory response to acetylcholine.

325 NAL Call No.: 410.9-P94

Time of death of CNS tumor-bearing rats can be reliably predicted by body weight-loss patterns.

Redgate, E. S.; Deutsch, M.; Boggs, S. S. *Lab-Anim-Sci* v.41(3): p.269-273. (1991 June)

Includes references.

Descriptors: rats; neoplasms; central-nervous-system; mortality; timing; prediction; weight-losses

Abstract: A request by the Institutional Animal Care and Use Committee for an alternative to death as an end point in a cancer research project using a rat brain 9L tumor cell model led to a search for reliable criteria for predicting time of death in this type of experiment. These experiments evaluated the therapeutic effectiveness of radiation alone, continuous intracerebral infusions of 5-iodo-2-deoxyuridine (IUDR) alone, and a combination of both therapies. We found that a characteristic pattern of body weight changes occurs after injection of 9L tumor cells into the brain ventricles or parenchyma. The initial phase was characterized by a loss of body weight which appeared to be related to surgery and, in the irradiated groups, to the subsequent doses of radiation under anesthesia on days 4, 6, and 7. After this initial phase (phase 1), a second period of weight change (phase 2) which was characterized by an overall gain of body weight interrupted temporarily in 76 out of the 149 rats by reversible episodes of weight loss of 1 to 5 days duration. The length of this phase 2 weight gain period was significantly extended by XRT- IUDR treatment in the rats with intraparenchymal tumors. The third and final phase consisted of a period of irreversible weight loss which may be related to cachexia. The third phase was similar in duration for control, XRT, IUDR and XRT-IUDR groups of rats and had a mean length of 9.8 +/- 0.27 days. Since the duration of this third phase was independent of treatment and significantly longer than the reversible episodes of weight loss in phase 2, it was predictive of the mean time of death in a group of rats. When the end of phase 2 was reliably determined, the time of death could be predicted to be 9.8 +/- 0.27 days later on average. This method accurately predicted the time of death in a pooled series of experiments in which death was used as an endpoint.

326 NAL Call No.: QL55.F43-1993

TMEV lesions in SCID mice.

Sanchez, S.; Rozengurt, N.; Bleby, J. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 115-119.*

Includes references.

Descriptors: mice; outbreaks; immunological-deficiency; case-reports; paralysis; histopathology; spinal-cord; lesions; immune-competence; sentinel-animals; theilers'-encephalomyelitis

327 NAL Call No.: QH506.M45--no.18

Transgenesis techniques : principles and protocols.

Murphy, D. 1.; Carter, D. A. D. A. 1. Totowa, N.J. : Humana Press, c1993. xii, 467 p. : ill., Includes bibliographical references and index. Introduction and topical reviews -- Introduction to transgenesis -- Transgenic rodents and the study of the central nervous system -- Transgenic animals and the study of cancer -- Transgenic animals and the study of the immune system -- Commercial and agricultural applications of animal transgenesis -- Transgenesis in invertebrate and lower vertebrate species -- P element-mediated germ-line transformation of *Drosophila* -- Gene transfer by microinjection in the zebra fish *Brachydanio rerio* -- Transgenic induction in Salmonid and Tilapia fish -- Transgenesis in the mouse -- Overview of transgenic mouse production -- Transgene design -- Isolation of DNA fragments for microinjection -- Establishing a colony for efficient production of transgenic mice -- Mating mice -- Anesthetizing mice -- Vasectomizing a mouse -- Preparation of culture media for fertilized one-cell mouse eggs -- Collection of fertilized one-cell mouse eggs for microinjection. into fertilized one-cell mouse eggs II: automatic injection -- Delivery of microinjected eggs to surrogate mothers by oviduct transfer -- Caesarean section and fostering -- In vitro fertilization of mouse eggs -- In vitro isolation of murine embryonic stem cells -- Production of chimeras derived from murine embryonic stem cells -- Cryopreservation of

transgenic mouse lines -- Transgenesis in the rat -- Introduction to the physiology and husbandry of the rat -- Mating of rats -- Vasectomy of the male rat -- Harvest of fertilized one-cell rat eggs -- Implantation of microinjected eggs -- Cryopreservation of transgenic rat lines -- Transgenesis in a domestic species: the sheep -- Production of transgenic sheep -- Cryopreservation of transgenic sheep lines -- Genomic analysis of transgenic animals -- Isolation of genomic DNA from tail tissue -- Slot blotting of genomic tail DNA -- Genomic analysis of transgenic animals by the polymerase chain reaction. tissues of transgenic animals -- Northern blotting -- RNA slot blotting -- Analysis of gene expression by PCR -- Nuclear run-on analysis of transcription -- S1 nuclease protection mapping -- Primer extension -- In situ hybridization analysis of transgenic tissues -- Immunohistochemical analysis of transgene expression -- Postmortem examination of transgenic mice -- Histological examination of transgenic mice -- Reporter enzyme assays -- Appendix -- Restriction endonuclease digestion of DNA -- Agarose gel electrophoresis -- Working with radioactivity in the transgenic animal laboratory -- Random primed labeling of DNA -- Filter hybridization -- DNA transfection.

Descriptors: Animal-genetic-engineering-Technique; Transgenic-animals; Genetic-transformation-Technique

328 NAL Call No.: QL55.A1L33

Transgenic animal care and treatment.

DeTolla, L. J.; Stump, K. C.; Allen, E. D. *Lab-anim* v.23(1): p.24-25. (1994 Jan.)

Includes references.

Descriptors: mice; transgenic-animals; animal-husbandry

329 NAL Call No.: QL55.A1L33

Transgenic mouse colony management.

Geistfeld, J. G. *Lab-Anim* v.20(1): p.21-25, 28-29. (1991 Jan.)

Includes references.

Descriptors: mice; transgenics; breeding-methods

330 NAL Call No.: QL55.A1L3

Transmission of murine viruses and mycoplasma in laboratory mouse colonies with respect to housing conditions.

Homberger, F. R.; Thomann, P. E. *Lab-anim* v.28(2): p.113-120. (1994 Apr.)

Includes references.

Descriptors: mice; disease-transmission; viral-diseases; viruses; mycoplasma-pulmonis; mycoplasmosis; animal-husbandry; animal-housing

Abstract: Pathogen-free sentinel mice were placed in 7 animal rooms with different housing conditions and were serologically screened for antibodies to mouse hepatitis virus (MHV), pneumonia virus of mice (PVM), Sendai virus, reovirus 3, Theiler's mouse encephalomyelitis virus (TMEV), ectromelia virus and Mycoplasma pulmonis by enzyme-linked immunosorbent assays, at intervals after introduction. The most commonly detected antibody was against MHV, which was found in mice from 4 rooms, followed by PVM antibody in mice from 3 rooms. Seroconversion to Sendai virus and TMEV was detected in mice from one room each. No seroconversion to any of the antigens was found in 2 rooms. The common criteria of these 2 rooms were that they housed pathogen-free animals from a single source and that the access to the rooms was, purposely or not, restricted to people who had no contact to other mice. The study demonstrated the importance of husbandry and hygiene regimen on the prevalence of infectious agents in laboratory mice.

331 NAL Call No.: 410.9-P94

Transmission of sialodacryoadenitis virus (SDAV) from infected rats to rats and mice through handling, close contact, and soiled bedding.

La Regina, M.; Woods, L.; Klender, P.; Gaertner, D. J.; Paturzo, F. X. *Lab-Anim-Sci* v.42(4): p.344-346. (1992 Aug.)

Includes references.

Descriptors: rats; sialodacryoadenitis-virus; mice; disease-transmission

Abstract: Thirty mice and six rats were exposed through handling, soiled bedding, or close contact to rats previously inoculated with sialodacryoadenitis virus (SDAV). All exposed rats developed coronaviral antibody without clinical signs or lesions of SDAV infection. Exposed mice had no lesions or clinical signs of coronavirus infection. Mice exposed by handling or by soiled bedding did not develop coronavirus antibody. Two of 10 mice exposed to SDAV-inoculated rats by close contact were coronavirus seropositive when tested 3 weeks postexposure. SDAV-inoculated rats and mice developed coronavirus lesions and antibody. These results suggest that rat-to-rat transmission of SDAV is likely via fomites or

handling; however, rat-to-mouse transmission is unlikely when animals are housed and husbanded using modern techniques. Results also suggest that coronavirus antibody in mice is due to exposure to mouse coronavirus and not to rat coronaviruses.

332 NAL Call No.: 442.8-L62

Unexpected regulation of hypothalamic neuropeptide Y by food deprivation and refeeding in the Zucker rat.

Beck, B.; Bulet, A.; Nicolas, J. P.; Bulet, C. *Life-Sci* v.50(13): p.923-930. (1992)

Includes references.

Descriptors: obesity; leanness; hyperphagia; feeding-behavior; food-deprivation; refeeding; food-intake; body-weight; neuropeptides; brain; blood- plasma; hypothalamic-regulation; rats

Abstract: Neuropeptide Y strongly stimulates food intake when it is injected in the hypothalamic paraventricular (PVN) and ventromedian (VMN) nuclei. In Sprague-Dawley (SD) rats, NPY synthesis in the arcuate nucleus (ARC) is increased by food deprivation and is normalized by refeeding. We have previously shown that the obese hyperphagic Zucker rat is characterized by higher NPY concentrations in this nucleus. NPY might therefore play an important role in the development of hyperphagia. The aim of the present study was to determine if the regulation by the feeding state works in the obese Zucker rat. For this purpose, 10 weeks-old male lean (n=30) and obese (n=30) Zucker rats were either fed ad libitum, either food-deprived (FD) for 48 hours or food-deprived for 48 h and refed (RF) for 6 hours. NPY was measured in several microdissected brain areas involved in the regulation of feeding behavior. NPY concentrations in the ARC was about 50% greater in obese rats than in lean rats ($p < 0.02$) whatever the feeding state. In the VMN, NPY concentrations were higher in the lean FD rats than in the obese FD rat ($p < 0.001$). Food deprivation or refeeding did not modify NPY in the ARC, in the VMN or in the dorsomedian nucleus whatever the genotype considered. On the other hand, food deprivation induced a significant decrease in NPY concentrations in the PVN of lean rats. This decrease was localized in the parvocellular part of this nucleus (43.0 +/- 1.9 (FD) vs 54.2 +/- 2.1 (Ad lib) ng/mg protein; $p < 0.005$). Ad lib levels were restored by 6 hours of refeeding. These variations were not observed in the obese rat. The regulation of NPY by the feeding state in the Zucker rat was therefore very different from that described in the SD rats. Strain or age of the animals used might explain these differences. High NPY levels and absence of regulation in obese Zucker rats could contribute to the abnormal feeding behavior of these rats.

333 NAL Call No.: QL55.A1L3

The use of a rat-derived microflora of providing colonization resistance in SPF rats.

Heidt, P. J.; Koopman, J. P.; Kennis, H. M.; Logt, J. T. M. v. d.; Hectors, M. P. C.; Nagengast, F. M.; Timmermans, C. P. J.; Groot, C. W. d. *Lab-Anim* v.24(4): p.375-379. (1990 Oct.)

Includes references.

Descriptors: rats; spf-husbandry; microbial-flora; germfree-state; colonization; resistance

Abstract: To obtain a suitable species-specific microflora for a new rat SPF-unit, germ-free WAG/Rij rats were associated with a flora derived originally from selectively decontaminated Cpb: WU (Wistar) rats. Caecal and ileal contents of these rats had been cultured anaerobically (37 degrees C) for 7 days and harvested. This cultured flora was given to germ-free Cpb: SE (Swiss) mice, which were kept in an isolator system and acted as a source of the flora to associate germ-free Wag/rij rats. In these associated rats, several parameters indicative of the 'quality' of the intestinal microflora were investigated and compared to those in rats with a mouse derived anaerobic microflora. Parameters included relative caecal weight, colonization resistance and the concentration of faecal bile acids. The cultured rat-derived microflora normalized the observed intestinal parameters better than the mouse derived microflora, and provided better colonization resistance. We conclude that culturing of intestinal contents of selectively decontaminated animals can be a useful way to obtain a species-specific donor-microflora which can be used to start new SPF units.

334 NAL Call No.: 389.8-J824

Use of the [14C]aminopyrine breath test to assess the hepatic response of dietary obese rats to a very-low-energy diet.

Young, E. A.; Harris, M. M.; Cantu, T. L.; Deneke, S. M.; Schenker, S. *Am-j-clin-nutr* v.57(6): p.863-867. (1993 June)

Includes references.

Descriptors: obesity; energy-intake; refeeding; experimental-diets; phenazone; breath; glutathione; liver; drug-metabolism; rats

Abstract: The intake of a very-low-energy diet (VLED) complete in all essential nutrients decreases liver mass and total liver protein in dietary obese rats. To determine how these findings may affect hepatic drug metabolizing activity, the

aminopyrine breath test was performed in nine male dietary obese Sprague-Dawley rats weighing 440-460 g. Animals were maintained on a VLED, and at 0, 14, and 21 d were injected with 9.25 k Bq (0.25 microcurie) [dimethylamine-¹⁴C]aminopyrine and placed in airtight restraining cages; exhaled ¹⁴CO₂ was collected for 120 min. VLED animals had an increased half-life of exhaled ¹⁴CO₂ ($p < 0.01$) and a decreased rate constant of aminopyrine elimination ($P < 0.01$) consistent with decreased N-demethylation of aminopyrine. Decreased liver glutathione suggests reduced ability to detoxify drugs through this conjugation pathway. These studies suggest that animals on VLEDs have reduced capacity for demethylation of aminopyrine as measured by oxidative elimination of ¹⁴CO₂, and may exhibit decreased metabolism of other drugs.

335 NAL Call No.: SF405.5.A23

A vacuum-assisted technique for collection of blood from the guinea pig.

Apgar, I.; Smith, I. C.; Carbone, L. G. *Contem-top-lab-anim-sci* v.33(5): p.56-57. (1994 Sept.)

Includes references.

Descriptors: guinea-pigs; blood-sampling; blood-specimen-collection; ears; vacuum; vacuum-gauges

336 NAL Call No.: QL55.F43-1993

The value of microsatellites for the characterization and genetic monitoring of rat inbred strains.

Zutphen, L. F. M. v.; Otsen, M.; Bieman, M. d.; Lith, H. A. v.; Jacob, H. J.; Bender, K. *Welfare and science proceedings of the Fifth Symposium of the Federation of European Laboratory Animal Science Associations, 8-11 June 1993, Brighton, UK / Federation of European Laboratory Animal Science Associations Symposium. London : Royal Society of Medicine Press, 1994.. p. 179-182.*

Includes references.

Descriptors: rats; inbred-strains; random-amplified-polymorphic-dna; microsatellites; strain-differences; genetic-polymorphism; screening; genetic-contamination

337 NAL Call No.: QL750.A6

Varied cages result in more aggression in male CFLP mice.

McGregor, P. K.; Ayling, S. J. *Appl-Anim-Behav-Sci* v.26(3): p.277-281. (1990 May)

Includes references.

Descriptors: mice; aggressive-behavior; cages; animal-welfare

338 NAL Call No.: 389.8-J82

Vitamin A deficiency increases noise susceptibility in guinea pigs.

Biesalski, H. K.; Wellner, U.; Weiser, H. *J-Nutr* v.120(7): p.726-737. (1990 July)

Includes references.

Descriptors: diet; vitamin-deficiency; vitamin-a; noise; susceptibility; guinea-pigs

Abstract: The effect of vitamin A deficiency in guinea pigs on noise-induced temporary threshold shift (TTS) was evaluated after short (15 min) acoustic overstimulation with a moderate (90 dB) broad-band white noise. Some guinea pigs were fed ad libitum a purified diet deficient in vitamin A (VAD group) until biochemical signs of deficiency occurred. A second, control group (VA group) received the same diet as well as 100 IU vitamin A daily by pharyngeal tube. Cochlear potentials were recorded by special computerized equipment using implanted electrodes. Before acoustic stimulation, a baseline value was determined with a test stimulus [90 dBA (A-filter according to usual DIN instructions)] corresponding to that for TTS measurements. Noise-induced changes were determined by calculating the changes in latency and amplitude of the N1-signal of the compound action potential (CAP) at various times (1, 3, 5, 7, 11 min) after termination of acoustic stimulation in comparison with baseline values. Statistical analysis of the CAP data showed that the VAD group had significantly smaller amplitudes and increased latency of the N1-potential after acoustic stimulation and that the VA group did not show a significant change in amplitude or latency. The reduction in N1-amplitude and N1-latency in the VAD group reflects changes in inner ear hair cell activity. We conclude that vitamin A deficiency increases the sensitivity of the inner ear to noise and that this increased sensitivity increases the probability of noise-induced hearing loss.

339 NAL Call No.: QL55.A1L3

Whisker trimming behaviour in A2G mice is not prevented by offering means of withdrawal from it.

Broek, F. A. R. v. d.; Omtzigt, C. M.; Beynen, A. C. *Lab-anim* v.27(3): p.270-272. (1993 July)

Includes references.

Descriptors: mice; integument; grooming; vibrissae

Abstract: Abstract: In group-housed laboratory mice whisker trimming (removal of vibrissae) occurs occasionally, but in the A2G strain it is seen almost invariably. We have tested the hypothesis that whisker trimming in A2G mice is not prevented by offering the possibility to withdraw from it. Pairs of male or female mice showing absence of whiskers and/or absence of nasal fur were separated by placing in their cage either one or two wire screens with a 10 mm mesh. Unlike the single screen, the two screens, which were 10 mm apart from each other, excluded nose to mouth contact. After five weeks, whiskers had regrown in mice separated by the double screen, whereas in the pairs separated by the single screen whiskers remained in part absent. This suggests that 2 mice involved in whisker trimming, either actively or passively, co-operate in this behaviour.

340 NAL Call No.: 472-N42

Why laboratory rats are here to stay.

Botham, P.; Purchase, I. *New-Sci* v.134(1819): p.29-30. (1992 May)

Descriptors: animal-experiments; animal-welfare; toxicology

Return to:

[Top of Document](#)

[Animal Welfare Information Center](#)

[National Agricultural Library](#)



The Animal Welfare Information Center, <http://www.nal.usda.gov/awic/contact.php>

<http://www.nal.usda.gov/awic/pubs/oldbib/qb9704.htm>, June 1997