

STUDY REPORTS

4. Title: Nutritional and Health Requirements for Development and Maintenance of Conventional Animal Colonies.

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Objective To produce and maintain healthy conventional laboratory animals for support of investigative programs and to establish procedures and breeding standards for optimum production and animal health within the colonies.

Description Random-bred production colonies of albino mice, rats, Syrian hamsters and Hartley strain guinea pigs are maintained in screened colonies at existing ambient temperatures with air circulation provided by overhead or floor fans.

Potential breeders for both rat and mouse colonies are selected from only P₂ and P₃ litters in which more than 8 animals were weaned. Females which do not become pregnant within 19 days after being placed with a male or which do not produce eight or more animals per litter are not retained as breeders. Normally females are retired after producing four litters. New male breeders are rotated between production rooms to prevent excessive inbreeding and to insure that the animals issued are random bred. Breeder groups are set up on a ratio of 3 females per male and males which do not impregnate at least 66% of the females they are mated with are discarded. Males are retired after being mated with five groups of females. The hamster colony is managed in similar manner except that a litter size of 6 is required for retention of a female breeder. Other species of animals utilized by investigators (non-human primates, rabbits, and poultry) are purchased as needed and conditioned prior to issue when applicable.

All animals are fed commercially prepared and imported animal diets supplemented as needed with fruits and vegetables. All animal cages are cleaned and sanitized at weekly intervals and high standards of personal hygiene are enforced for animal caretakers.

Animals are observed daily for signs of disease and frequent checks are made for parasitic infestations and pathogenic bacterial infections. All non-human primates are tuberculin tested quarterly. Necropsies are performed on all animals that die within the colonies and tissues from these animals are submitted for histopathological examination.

Progress Mouse Colony During this report period the mouse production colony produced the largest number of animals since the colony was established. Careful selection of breeder stock has resulted in improved conception rates, litter sizes and weaning rates over previous years. However, environmental temperature variations between seasons of the year cause considerable fluctuations in breeding performance. Monthly conception rates within the colony varied between 53.76% and 89.41% with a mean of 77.76% (Table 4). Lowest rates occurred during the hot season months of March and April. Likewise, the number of mice born per litter was lower during the hottest months.

Table 4. ANNUAL MOUSE PRODUCTION

Month	Litters Born	Number Born	Average Litter Size	% Conception Rate
Apr 67	2,286	19,990	8.74	66.14
May 67	2,302	19,655	8.53	53.76
Jun 67	2,523	22,154	8.78	89.41
Jul 67	2,578	22,670	8.79	85.15
Aug 67	2,423	22,614	9.33	88.31
Sep 67	2,095	20,450	9.76	76.01
Oct 67	2,462	23,510	9.54	77.00
Nov 67	3,000	29,175	9.72	77.32
Dec 67	2,903	28,217	9.71	76.69
Jan 68	2,888	30,178	10.44	80.42
Feb 68	2,722	28,000	10.28	80.81
Mar 68	2,951	29,584	10.02	82.17
Total	31,133	296,197	9.51	77.76

Approximately 45% of the adult mice were found to harbor oxyurid infestations of Syphacia obvelata and Aspicularis tetraptera while approximately 65% harbor tapeworms (Hymenolepis sp.) No infestations of the tropical rat mite (Ornithonyssus bacoli) have occurred in the colony in the past year.

Rat Colony: Total rat production for the year was 12,054 ratlings from 1,317 litters. Average litter size was 9.15. This production was slightly increased over previous years and was adequate to meet demands from investigators.

Ambient temperature variations caused fluctuations in breeder performance similar to, but less pronounced, than those encountered in the mouse colony. The deaths of fifteen mother rats nursing litters during the months of April and May were attributed to heat stress. These deaths occurred only when afternoon room temperatures over 92° F were encountered several days in succession.

There have been no reoccurrences of increased mortality in suckling rats due to intestinal obstruction produced by sawdust bedding particles since only bedding retained by a 20 mesh screen has been used. Ratling mortality rate prior to weaning age has averaged less than 8% for the past year. A large percentage of these deaths are caused by hydrocephalus believed to be produced by genetic factors.

Guinea Pig and Hamster Colonies: The SMRL guinea pig colony continues to be unable to produce sufficient numbers of animals to supply demands, requiring that additional guinea pigs be purchased from other sources. Further expansion of the colony is prohibited at present by a lack of floor space. No unusual health problems have been encountered in the SMRL Colony.

Hamsters were in little demand by investigators and the colony was reduced in size during the latter part of the year to adjust production with usage. An infestation of tropical rat mites occurred in the hamster colony during December and was accompanied by a marked decline in production. Treatment of hamster cages and racks with DDT eradicated the infestation. Hamster and guinea pig production figures are shown in Table 5.

Table 5. ANIMALS BORN IN HAMSTER AND GUINEA PIG COLONIES

Animals	Number of Litters	Number of Animals	Average/Litter
HAMSTERS	1,652	11,830	7.16
GUINEA PIGS	510	1,637	3.20

Other Animals Colonies with an average population of 150 simian monkeys and 150 gibbons are maintained in double screened rooms. Many of the disease problems affecting these animals in the United States have not been encountered or have produced little or no clinical disease in these animals. Diarrheas are seldom seen although routine stool cultures occasionally reveal latent shigella infections. No tuberculosis has been found in the colonies in the past 2 years.

Other animals are procured and maintained as required by investigators. The number of animals issued during the report period are shown in Table 6.

Table 6. ANIMALS ISSUED FOR INVESTIGATIONS

SPECIES	PRODUCED			PURCHASED		
	Suckling	Juvenile	Adult	Suckling	Juvenile	Adult
MICE	88,136	55,096	6,548	—	—	—
RATS	425	5,339	269	—	—	—
HAMSTERS	—	972	137	—	—	—
GUINEA PIGS	—	1,047	35	—	2,230	—
RABBITS	—	—	—	873	—	398
GIBBONS	—	—	—	—	7	16
MONKEYS	—	—	—	—	53	—
POULTRY	—	—	—	—	98	34

Total animals issued 161,668
 Animal blood issued 57,492 cc.
 Embryonated eggs issued 1191 doz.

Summary The highest overall production and issue of laboratory animals since establishment of the colonies were recorded during the report period. Animals in these colonies appear to be well adapted to the high ambient temperatures of the Bangkok area; however, fluctuations in rodent production do occur particularly during the hot season. Only minor disease problems have occurred in the colonies.