Chapter

1

Care Handling

- Though the animals were first used in research in second century AD their systematic use in research began about 100 yrs ago, when vaccines for polio and rabbis came up for production.
- The animals have been used in research investigations and production of biological and have played an important role in unfolding vital information about the human and animal life process.
- This has helped in the advancement of medicine development of drugs, diagnostics and production of biological for alternating sufferings of both human and animals.
- *In vitro* alternative methods cannot replace animal experimentation totally-but can work only as adjuncts and reduce the number of animals in some cases.
- Scientists are deeply concerned about the rational and humane use of animals in research. Ethics committees are functional in many institutes.
- They are concerned about avoiding unnecessary pain or suffering or injury to animals during holding experimentation and post experimental periods by monitoring and improving their housing, environment, feeding and veterinary care.
- The govt of India has authorized the National Accerediation Board of Testing and calibration Laboratories (NABL) promoted by the Department of Science and Technology (DST) to provide Accreditation services to Laboratories covering a wide range of subjects including biological and clinical laboratories.
- NABL is full member of International Laboratory Accreditation Co-operation and the Asia pacific Laboratory co-operation.
- These are there to demonstrate their commitment to responsible animal care and use and good science. Since such an Accreditation is an indicator of an institution, ability to comply with its assurances.

- No standard document was available for reference till 1992.
- Indian National Science Academy (INSA) developed the guidelines for use of animal in scientific research.

NEED

- It work for the society—humans, the animals and the environment
- Need to provide them certain degree of freedom and adequate facilities to use animals where ever necessary.
- *In vitro* alternatives can only provide limited information and it cannot replace the animal models.
- So use of animals continues to be mandatory to meet the statutory regulatory requirements.
- Experiments conducted on animals are rational and unavoidable and no unnecessary pain or injury is inflicted on them they are maintained in the best possible conditions.

OBJECTIVES OF GUIDELINES

- Housing care, breeding and maintenance of experimental animals to keep them in physical comfort and good health and to permit them to grow, reproduce and he have normally.
- Sources of experimental animals of known genetic, health and nutritional status.
- Development of training facilities for scientist, technicians and other supportive staff for the care of animals and their use in experiments.
- Acceptable experimental techniques and procedures for anesthesia and euthanasia.
- Developing alternative *in vitro* systems to replace animal experiments.
- The constitution of institutional ethics committees, their functions and the legal and ethical obligations o ensure minimal and ethical use of animals.

CURRENT STATUS

INSA Guidelines–adopted by well established institutions in India for care and use of their Lab animals.

REGULATION

- The use of lab animals is governed by an interrelated dynamic system of regulation policies, guidelines and procedure. The guide takes into consideration regulatory requirements relevant to many US-based activities, including the Animal Welfare Regulations (USDA 1985) US code, 42 USC s289d and the public health service policy on Humane care and use of laboratory animals PHS 2002.
- The use of guide by non US entities also presumes adherence to all regulations relevant to the humane care and use of laboratory animals applicable in those locations.
- Guide takes into account the US Govt –principles for utilization and care of vertebrate, animals used in testing, research and training (IRAC 1985).
- National advisory committee for laboratory animal research (NACLAR)-2003—national accreditation board of testing and calibration laboratories (NABL) by DST.

PRINCIPLES

- Consideration of alternatives (*in vitro* systems computer stimulants and or mathematical models) to reduce or replace the use of animals.
- Designs and performance of the procedure on the basis of relevance to human or animal health, advancement of knowledge or the good of society.
- Use of appropriate species, quality and number of animals.
- Avoidance or minimization of discomfort distress and pain
- Establishment of humane endpoints
- Provision of appropriate animal transportation and husbandry directed and performed by qualified persons.
- Conduct of experimentation on living animals exclusively by and or under the close supervision of qualified and experienced personnel.

LEGAL PROVISION

Prevention of cruelty to animal act of 1960 to control and supervise experiments on animals inspection through inspectors.

SOURCES OF EXPERIMENTAL ANIMAL

- Animals for experiments should be procured by scientist form recognized animal facilities.

Parameters	*Mouse*	*Rat*	*Hamster*	*Guinea pig*	*Rabbit*	*Cat*	*Dog*	*Monkey*
Wt at birth (gm)	1–2	4–5	2–3	80–100	40–60	100–130	400–500	460-500
Age at weaning	3	3	3	3	8	4–6	6–8	20-24
Wt at weaning	9–12	40–50	30–40	250–300	800–900	400–700	-	400-700
Age at maturity w: weeks y: years	6–8 w	10–12 w	6–8 w	16–20 w	24–32 w	30–35 w	1–1.2 y	4-5 y
Wt at maturity	18–22 g	150–200 g	80–90 g	250–400 g	1.5–2.0 kg	4–6 kg	15–25 kg	9-10kg
Adult wt	25–30	200–300 g	80–100 g	400–500 g	2–2.5 kg	3–5 kg	12–15 kg	10-12kg
Rectal temperature	37.4	37.5	37.6	38.6	38.7	39.5	38.6	38.4
Repiratory rate/min	90–180	80–150	40–120	60–110	35–36	20–30	14–28	30-54
Pulse rate /min	600	300	450	150	133	110	95	200
Life span yrs	1.5–2	2.5–3	1.5–2	4–5	4–5	8–12	10–15	15-20
Oestrus cycle (days)	4–5	4–5	4–5	16		14	Biannual	
Duration of oestrus	10h	13–15 h	20 h	6–11 h		3–6 d	14–21 d	
Gestation period (days) average	21	21	16	68	30	63	62	
Average weight of adult	25–30 g	200–300 g	80–100 g	400-500 g	2–2.5 kg	3–5 kg	12–15 kg	
Type of housing	Cage	Cage	Cage	Cage/pan	Cage	Cage	Cage	
Floor area per animal (sq.cm)	65–100	100–150	90–120	300–600	3700–4600	2500–3500	7000-12000	
Cage ht in Cm	12	14	12	18	36	36	–	
Room temp °C	22–24	22–24	22–24	22–24	22–24	Air dried	Air dried	
Relative humidity	45–60	50–60	45-60	45–60	45–60	45–60	45–60	

(Contd.)

Parameters	*Mouse*	*Rat*	*Hamster*	*Guinea pig*	*Rabbit*	*Cat*	*Dog*	*Monkey*
Suitable bedding material	Paddy husk Saw dust	Paddy husk Saw dust	Paddy husk Saw dust	Paddy husk Saw dust				
Photocycle	12:12	12:12	12:12	12:12	12:12	12:12	12:12	12:12
Maximum number of animals per cage	25	25	25	12	2	1–2	1–2	1
Materials used in transport	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material	Metal cardboard synthetic material

- Animal trapped from wild like Monkey, freak dogs and cats are also used in research as they are readily available and less expensive compared to colony bred animals.
- Generally quarantined and stabilized in animal facility before used in experiments.
- Health and genetic status of these animals are not known –screening carefully at quarantine is necessary.
- Should be brought after due clearance from Institutional Animal Ethics Committees and through certified suppliers.