

*Varying Alcohol  
Concentrations  
The Rats Drink*

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# *Introduction*

*Scientists use animals when the use of humans is either impractical or unethical. For example when scientists investigate fetal Alcohol syndrome, they cannot give alcohol to pregnant women but they can give to Pregnant animals such as rats. Scientific research with animals has contributed to many important advances in scientific & medical knowledge.*

*Mice and rats are a useful model for studying the effects of alcohol. The SD rats are more active during the night than during the day. SD rat is a general model for the study of human health and disease. The SD rats is a widely accepted, dependable, general purpose research model used in virtually all disciplines of biomedical research including toxicology and pharmacology.*

# *Sprague Dawley*



*[http://www.hku.hk/launit/pictures/sc\\_rat.jpg](http://www.hku.hk/launit/pictures/sc_rat.jpg)*

Much of the research into the effects of alcohol on humans uses animals. Animal models do have their drawbacks. Some animals are difficult or expensive to maintain. Many scientists try to develop non animal models using cell cultures or computer simulations. Unfortunately, such models usually fail to duplicate the complexity of the animal or human body. Medical and scientific research will continue to depend on animal models for the foreseeable future.

## **Behavior**

Rats are normally lifted by grasping the whole body with the palm over the back, with forefinger behind

the head and the thumb and second finger under opposite axilla. This extends the rat's forelimbs so that they may be controlled (future picture). Holding with one hand is usually adequate for control, but the tail, rear legs or lower part of body may be held by the other hand for close control, treatment or examination ( The use of both hands is often necessary for rats weighing over 350 grams. Young rats may be when body size does not permit ease of handling within the hand. Investigators should avoid lifting by the tail as they may strip the skin from the tail. This is particularly likely for heavy rats (450 grams), rats that "spin," and when the tail is grasped more than a couple of centimeters from its base. However, the "base" of the tail may be grasped with the thumb and forefinger). With this simple method of holding, they may be transferred to another cage or a balance, identified, examined casually or sex may be determined. For transporting short distances it may be helpful to support the rat with your arm or hand while holding the tail. The rat can become accustomed to handling providing they are not upset by the experience. Rats will bite without warning, but not repeatedly. Unlike mice, groups of the same sex can be housed together without fighting. Rats are active primarily during the night at which time they feed; the light hours are used primarily for rest, sleep and digestion. Handling animals during the night

phase can be more difficult due to this increase in activity. The diurnal rhythm can be changed by a 12 hour shift in the light cycle. It takes approximately two weeks for rats to adjust to this shift.

### **Breeding:**

Rat colonies tend to be very labor intensive and are discouraged for the production of commercially available rat strains. For strains not available commercially or in instances where neonatal or fetal animals are required breeding colonies are maintained. Investigators requiring the establishment of breeding colonies should consult with the Animal Care Unit to assure proper management of the colonies. Breeding animals have different nutritional requirements, which if not provided, will have a detrimental effect on reproductive performance. Light cycles are important in breeding rats and are provided with 12 hours of light and 12 hours of dark. Deviations from this cycle will affect reproductive performance. Rats will bite and certain strains are more aggressive than others.

# Materials and Methods

Alcohol (EtOH)

Water (H<sub>2</sub>O)

## **Sprague Dawley (SD) rats**

**1% concentration=10ml EtOH, 990ml H<sub>2</sub>O**

**2% concentration=20ml EtOH, 980ml H<sub>2</sub>O**

**3% concentration=30ml EtOH, 970ml H<sub>2</sub>O**

**5% concentration=50ml EtOH, 950ml H<sub>2</sub>O**

**7% concentration= 70ml EtOH, 920ml H<sub>2</sub>O**

**9% concentration=100ml EtOH, 910ml H<sub>2</sub>O**

We feed EtOH to SD rats once a week. We weight the bottles into grams (g) before we feed them and also after we feed them.

Record the time we place the bottles on the cage. Wait exactly one hour before we remove the bottles. Each rat has its own separate EtOH and H<sub>2</sub>O bottle. There is 22 SD rats, Each bottle is numbered 1-22 for rat 1-22. There was different number that was set up for each bottle. Bottles with orange tape are for EtOH and those with blue are for water.

(rats#1 gets orange#1 and blue #1)

This is the amount of alcohol and H<sub>2</sub>O that was drunk by the Sprague Dawley. This shows the differences between alcohol and H<sub>2</sub>O.

Do SD rats drink more alcohol (EtOH) than water (H<sub>2</sub>O), or more water (H<sub>2</sub>O) than alcohol (EtOH)? According to this graph it shows that SD rats drink more alcohol than water.

# Acknowledgements

Dr. Sat Bhattacharya

Micki

Daisy

Harlem children society

Hunter College

Memorial Sloan Kettering

Cancer Center

Dr. Michael Lewis