

Biology & Husbandry





By: Shadman Memarian

Anatomy Biology Breeding - Housing Diet



INTRODUCTION



Hamster is rodent of the family Circetidae

Hamsters can be found in the wild in Eastern Europe, North Africa, China, Siberia & Middle East



BREEDS

Syrian or golden hamsters (Mesocricetus auratus)

- most common pet & research hamsters
- Indigenous to north west Syria
- Different color variations exist : grey, albino, black, Cinnamon, reddish-brown, cream, white and piebald







BREED



 Different coat type: Short hair Long hair



BREED



European hamster or Russian dwarf hamster (Cricetus cricetus)

largest hamster of the word



BREED

Chinese or striped hamster (*Cricetulus griseus*)
has a longer tail than the other dwarf hamsters
It is also more aggressive to fellow cage mates
better housed alone





Dental formula 2(I 1/1,C 0/0,P 0/0,M3/3)

Hamsters have 3/3 molars with fixed roots and 1/1 open rooted incisors, yellow / orange in color







Cheek pouches

Cheek pouches are oral cavity evaginations , reaching alongside the head and neck to the scapulae







Flank glands

On either flank, usually buried in hair and always more prominent in males, Lie dark brown patches known as flank glands







Stomach

The hamster stomach is separated in to squamous (fore stomach) and glandular stomach



Reproductive Anatomy

Female

- Bicornuate uterus
- Each uterine horn opens separately into vagina
- 12-14 nipples

Male

- Os penis
- Large seminal vesicles





PHYSIOLOGIC VALUES

HAEMATOLOGY

Blood volume	78 ml/kg	Lymphocytes	50-95%
Blood pressure	150/100 mm Hg	Eosinophils	0-4.5%
Erythrocytes	6-10x10 ⁶ /mm ³	Monocytes	0-3%
laematocrit	36-55%	Basophils	0-1%
laemoglobin	10-16 gr/dl	Platelets	200-500x10 ³ /mm ³
.eukocytes	3-11x10 ³ /mm ³	Red blood cells	7.5x1012/l
Neutrophils	10-42%	White blood cell	7.62x 109/l

BIOCHEMISTRY

Serum protein	4.5-7.5 gr/dl	Serum calcium	5-12 mg/dl
Albumin	2.6-4.1 gr/dl	Serum phosphate	3.4-8.2 mg/dl
Globulin	2.7-4.2 gr/dl	phosphorus	2.29 mmol/l
Serum glucose	60-150 mg/dl	Total protein	61 gr/l
Blood urea nitrogen	12-25 mg/dl	Alkaline	131 11/1
Creatinine	0.91-0.99 mg/dl	phosphatase	
Total bilirubin	0.25-0.60 mg/dl	Lactate dehydrogenase	224 10/L
Cholesterol	25-135 mg/dl	Aspartate aminotransferase	57 IU/L

Undeserved reputation for pugnacity

Adept at chewing on and escaping from their cage

Nocturnal and most active during the dark

Female hamster conceal her new born litter in her cheek pouches

BEHAVIOR

Restraint

Restraint - Scruffing

BREEDING

Sexing
Estrus cycle
Mating
Pregnancy
The litters

ESTROUS CYCLE

Puberty at 32 to 42 days (female 6-10 weeks and the male 10 to 14 week old)
Estrous cycle lasting about 4 days
As estrus approaches in a sexually mature female a thin, stringy, translucent, cob web like mucus can be drawn from the vulva

 Seasonal sexual quiescence
 Except for the few hours of estrus the sexually Unreceptive female will usually attack a recently Introduced male.

A receptive , nonbelligerent approach of the female toward the male during early evening portends mating

The absence of estral discharge at 5 and 9 days post mating and the observation of a distended abdomen and rapid weight gain at 10 days are signs of pregnancy

Gestation period lasts 15.5 to 16 days

Before delivery the female becomes active, restless and bleed from the vulva

Litters usually contain from 5 to 9 young

Pseudo pregnancyActive nest building and nest material

THE LITTERS

Day 1

- Neonatal hamsters are very immature
- Newborn hamsters have fully erupted Incisor teeth
- The incisors are used in nursing to strip milk from the teats of the dam wile suckling

THE LITTERS

Day 1 The eyes and ears are closed

THE LITTERS

Day 6: ears are opened

- Day 7: young hamsters begin gnawing solid food and drinking water at 7-10 day of age
- Day 9: eyes are opened

Day 25:

REPRODUCTION DATA

°•,•]

Breeding onset : male	10-14 wk	
Breeding onset : female	6-10 wk	
Cycle length	4 days	
Gestation period	15-16 days	
Postpartum estrus	Infertile	
Litter size	5-9	
Weaning age	20-25 days	
Breeding duration	10-12 mo	
commercial	5-7 litters	
Young production	3 mo	
Milk composition	12% fat, 9% pr, 3.4% lact	
Birth weight	2 g	

~

Several acceptable types of hamster cages are available

Cage need to be resistant to gnawing

In the wild hamsters will travel long distances at night and thus require plenty of exercise in captivity

Hamsters are borrowing animals by nature and like a deep layer of bedding

FEEDING & WATERING (DIET)

Hamsters in the wild are omnivorous

Hamsters eat 5-12gr feed and drink 10ml water per 100gr body weight daily

 Protein requirements rage from 16% for maintenance up to 20% for reproduction
 Requirements for carbohydrate are 60-65%
 Requirements for fat 4-5%

Dietary fat above 7-9% may increase mortality
 Protein deficiency may cause alopecia and...

FEEDING & WATERING (DIET)

Atrial Thrombosis

Spontaneous cardiac thrombi in aged hamsters

- Common 13 to 27 months of age
- Usually left atrium
- Both sexes affected
 - Occurs earlier in females
- Clinical signs
 - None prior to death
 - Tachypnea & cyanosis
- Postmortem findings
 - Ventricular hypertrophy
 - Nonseptic inflammation
 - Myocardial degeneration
 - Pulmonary edema and plural effusion

- Syrian Hamsters:
 - 1. Infection disease
 - 2. Cancer
 - **3.** Immunology
 - 4. Hypothermia
 - 5. Dental caries
 - 6. Reproductive physiology
 - 7. Cardiomyopathy
 - 8. Thrombosis

Chinese Hamsters:

1. Type 1 juvenile_onset diabetes

2. Cytogenetic studies

Both Syrian and Chinese hamster used in radiology research because they are radioresistant

Siberian Hamsters:

Pineal gland studies
 Its effects on the photoperiod

For blood withdrawn thumb suggests

Retro orbital bleeding under anesthesia

Jugular or fem oral vain

Cardiac puncture(larger blood samples)

Metabolic cage

Cold metal or plastic cooled bag

Drug administraition

Dosage accuracy needs:
 Dilution of drugs
 Tuberculin syringe

Antibiotic associated toxicity:
 ✓lincomycin, clindamycin, ampicilin, vancomycin
 Erythromycin, cophalosporins, gentamycin, penicillin

Drug administraition

Orally (mixing them in the water or food)

Eyedropper

Gavage needle

Subcutaneos injection (SC)

Intera Muscular injection (IM)

Intera peritoneal injection (IP)

