

Husbandry Guidelines for



Persian Onager *Equus hemionus onager*

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1.0 Introduction

This is a guide to the captive management of the Persian Onager. It includes information on their natural habitat, wild status captive requirements, general health and breeding. The Persian Onager is an Asiatic Ass that Endangered in the wild with around 400 animals left in the wild. As you will read further down they come from Northern Iran and are there are around 155 animals held in zoos around the world. By housing and breeding this species zoos around the world are contributing to conserving this species and protect them from the threat of extinction.

1.1 IUCN Category

Persian Onager are listed as Critically endangered on the IUCN Red list as of 2006

1.2 Wild Population Management

The species is currently being monitored in the wild very closely. There have been animals reintroduced into the wild to boost captive numbers. There are a number of organizations that are helping to monitor the Persian Onager including the Department of Environment of Iran.

1.3 Species Coordinator

There is currently no species coordinator in the Australasian region due to the only animals held in the southern hemisphere being held at Taronga Western Plains Zoo in Dubbo NSW Australia.

1.4 Studbook holder

The international studbook holder is Clause Pohle, Tierpark, Berlin, East Berlin 1971–1988.

2.0 Taxonomy



2.1 Nomenclature and systematics

Kingdom : Animalia
Phylum : Chordata
Subphylum : Vertebrata
Class : Mammalia
Order : Perissodactyla
Family : Equidae
Genus Species : Equus Hemionus

2.2 Subspecies :

The kulan (*E. h. kulan*), The Gobi kulan (*E. h. luteus*), Mongolian wild ass (*E. h. hemionus*), Indian wild ass or khur *Equus hemionus khur*, The Syrian wild ass *Equus hemionus hemippus* (now extinct)

2.3 Recent Synonyms

E. Onager Onager, There is some debate over the taxonomic identity of the onager. Bennett (1980) regarded *Equus onager* as a distinct species. However, many experts now regard it as a subspecies of the Asian wild ass (*E. hemionus onager*).

(http://www.edgeofexistence.org/mammals/species_info.php?id=14)

2.4 Other Common Names

Persian Wild Ass, Asian Wild Ass, Persian Onager, Onager

3.0 Natural History

3.1 Diagnostic features

3.1.1 Mass and Basic Body Measurements

Body Length: 1.98-2.3 metres

Shoulder Height: 1.2-1.4 metres

Tail length: 30-49cms

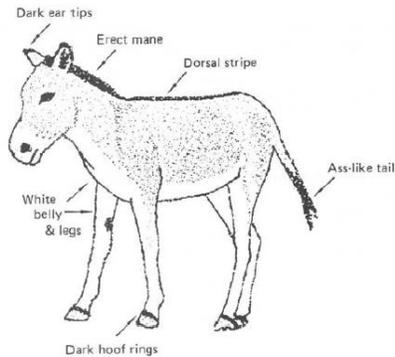
Weight: 200-260kgs

Juvenile: Weight at birth 25-30 kg.

Ear length: 164mm

Hoof Breadth: 69mm

(http://www.sandiegozoo.org/animalbytes/twild_ass.html)



(http://www.cites.org/eng/resources/ID/fauna/Volume1/A118.001.001.005%20Equus%20hemionus_E.pdf)

3.1.2 Sexual Dimorphism

Its colour varies from cinnamon-brown in summer to yellow-brown in winter and its muzzle and underparts are white. It has several black stripes across the upper parts of its hind legs and an indistinct black streak across its shoulders. Females do not possess this stripe. Female onagers are also smaller than the males.

(http://encarta.msn.com/encyclopedia_762509469/Onager.html)

3.2 Distribution and Habitat

3.2.1 Distribution

The Persian wild ass: (or onager) may be found in northern Iran and in the Badkyz Reserve in Turkmeniya, part of the former USSR. This reserve was specially established for the protection of the wild ass in 1941. They may also be found on an island in the Aral Sea.

(http://www.ypte.org.uk/docs/factsheets/animal_facts/asiatic_wild_ass.html)



(<http://www.iucn.org/themes/ssc/sgs/equid/AsMap.html>)

3.2.2 Habitat

Inhabits flat **steppe**, semidesert or desert. They are always found within 30 km of a spring or oasis.

(**Steppe:** A biome (or subdivision of the Earth's surface) that is composed of a swathe of temperate grassland stretching from Romania to China.)

3.3 Conservation Status

The IUCN Red List 2003 classifies the Asian wild ass *Equus hemionus* as Vulnerable (VU A3bcd; C1), it is listed under Appendix II of CITES. There are a number of subspecies, the Onager *Equus hemionus onager* is Critically Endangered (CR C1) and is also CITES-II listed. (http://www.arkive.org/species/GES/mammals/Equus_hemionus/more_info.html?section=all)

3.4 Longevity

3.4.1 Wild

The oldest found specimen in the wild was 12-14 years old. Most *E. hemionus* live between four and eight years. A majority of these die between four and six years old, not long after entering sexual maturity.

Extreme Lifespan 14 yrs

Average Lifespan 6 yrs

3.4.2 Captivity

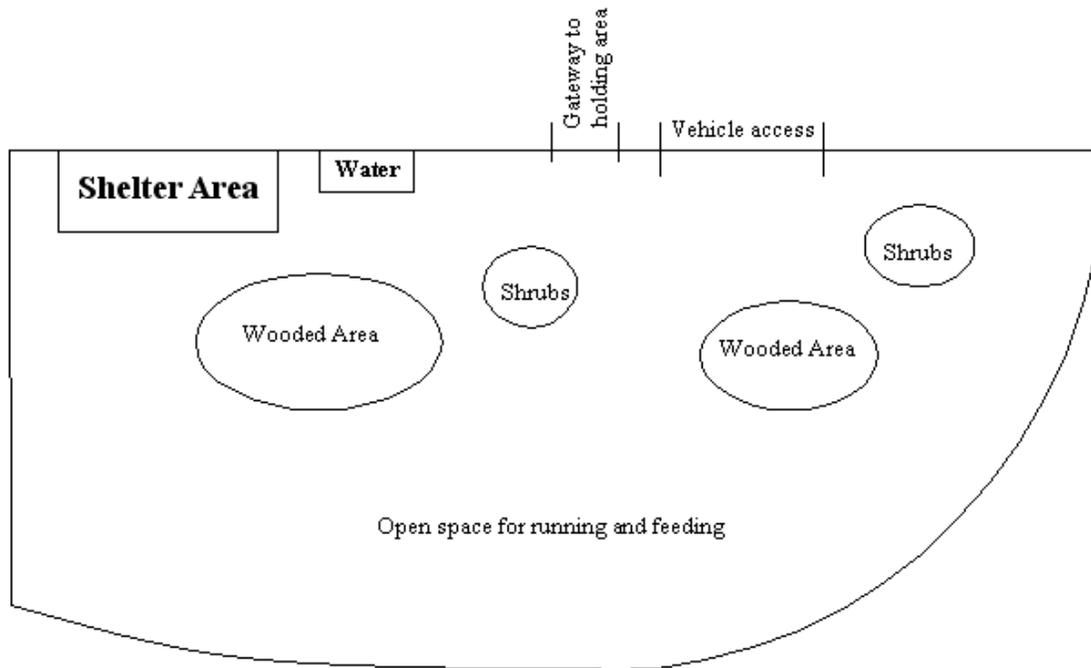
In captivity, Asian wild asses have lived for 26 years.

Extreme Lifespan 26 years however there are rumors that these animals have lived up to 35 years.

(http://animaldiversity.ummz.umich.edu/site/accounts/information/Equus_hemionus.html)

4.0 Housing Requirements

4.1 Exhibit Design



Total area of exhibit is 900m². The two straight sides of the exhibit are restricted access areas so no public. The fence is 7 foot high and made of chainwire.

The front of exhibit is a dry moat system with an electric fence at the bottom of it to discourage public from entering. It also promotes a sense of being apart of the herd. The public are seeing the animals on their level with no obvious fencing in the way.

4.2 General Principles

- Persian Onagers require a lot of space. Institutes planning on housing these animals need to provide sufficient open space to run as well as shelter to protect from the elements.
- Off exhibit holding yards need to be suitably fenced eg. chainwire to a minimum height of 6 feet. Yards need to be a minimum 20 m² for the first 2 adult animals. You can use the indoor holding facilities as a guide.
- Shelter must be provided both on exhibit and off, a stable is suitable.
- Water troughs must be provided in all yards.
- There should be a designated feeding area in all yards
- Any trees planted in exhibit must be suitable for the animals to browse on.

Gates to exhibit should open inwards and there should be sufficient room to drive a truck through for ease of maintenance and veterinary care.

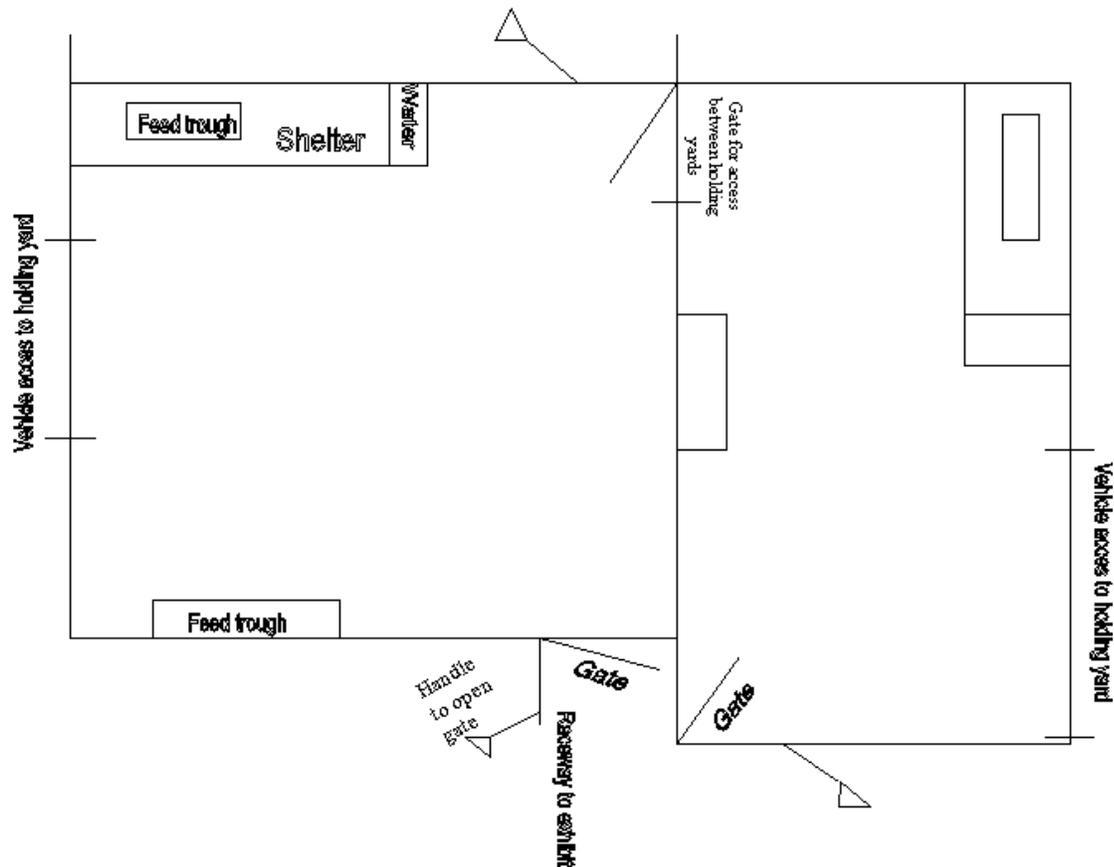
4.2.1 Holding Area Design

Each holding area is designed to hold 5 adult Onager it is 32m². There are 2 yards that will allow for separation of individuals or pairs if need be. Each yard has vehicle access and gates that can be opened externally allowing the keeper to never enter the area with the animal. Two yards also allow the keeper to rest a holding area if it becomes worn without any trouble.

All fences are 7 feet high and made of chainwire with mesh to screen certain panels of fencing. Gates are made of the same material.

Shelter areas are made of timber.

Water troughs are concrete and feed troughs are metal and durable plastic for easy cleaning and moving around exhibit.



4.3 Spatial Requirements

Asiatic wild asses should be kept in social groups of one adult male and several females with their offspring. Also the keeping of groups of compatible bachelors is possible. For up to five adult animals an outdoor enclosure of at least 800 m² is required, which should be enlarged by 80 m² for each additional adult. There must be an easily accessible shelter of sufficient size. No indoor facilities are required. Where Asiatic wild asses are kept indoors at times, either a common stable of 20 m² for the first two adult animals is required, which has to be enlarged by 2 m² for each additional adult or, if the animals are individually stabled, there must be boxes of at 8 m² each.

(<http://www.waza.org/virtualzoo/factsheet.php?id=118-001-001-005&view=Equids>)

DPI Clause 18 Spatial Requirements

1) The size and shape of enclosures must provide freedom of movement, both horizontally and vertically.

- 2) An enclosure must be of sufficient size, and the animals in the enclosure must be so managed, as to:
- a) avoid undue domination of a herd or group by an individual or individuals; and
 - b) avoid the risk of persistent and unresolved conflict between herd or group members or between different species in enclosures containing different species; and
 - c) make it possible for an animal to avoid, or withdraw from, contact with other animals or with people; and
 - d) ensure that the carrying capacity of the enclosure is not exceeded; and
 - e) prevent an uncontrolled accumulation of parasites and other pathogens; and
 - f) encourage and permit exercise and behavioural enrichment.
- 3) Each animal must be provided with sufficient space in all directions to enable it:
- a) to take exercise; and
 - b) to be protected from undue dominance and conflict; and
 - c) to be provided with its social, breeding and husbandry needs.

(http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0019/121564/general-animal-exhibition-standards.pdf)

4.4 Position of enclosures

If possible enclosures should be positioned to provide both access to shade and full sunlight. Depending on the season animals should be able to move between the 2 at will.

4.5 Weather Protection

There must be an easily accessible shelter of sufficient size. No indoor facilities are required. The animals should have areas to which they may retreat and separate facilities should be available to allow separation of animals where necessary, e.g. stables. At all times animals should be protected from conditions detrimental to their well-being.

4.6 Temperature Requirements

No heating need to be made available unless temperatures of 0°C and below are reached. If this is the case a simple heat bar in the stables or shelter area should suffice.

4.7 Substrate

The enclosure should be well structured, frequently used areas, e.g. at the entrance to the stables, should be paved. The soil should be well drained. There should be sandy patches allowing for wallowing.

<http://www.waza.org/virtualzoo/factsheet.php?id=118-001-001-005&view=Equids>

5.0 General Husbandry

5.1 Hygiene and Cleaning

As with any species faeces must be collected daily and any other waste material, old browse and or left over feed must also be removed and disposed of according to institutional policy and procedures. It is best to clean as early as possible and place food out immediately prior to giving animals access to it. This ensures pests do not soil or eat any.

Troughs can be simply scrubbed using water and a scrubbing brush however if needed cleaning products that can be used on feed troughs sparingly are Red Gum disinfectant* and F10*. Please remember that these products must be thoroughly washed off before using.

*See Appendice I and II for MSDS

5.2 Record Keeping

The following information needs to be kept by the curator and sent from the sending institution to the receiving institution:

1. Identification number, common name, scientific name, any personal name, and any distinctive markings
2. origins; the details of the parents, their origin and any previous locations
3. dates of acquisition and disposal, details of circumstances and addresses
4. date of birth
5. Veterinary records, results of physical examinations, details and dates of any treatments, results of routine health checks

Should include: Species, sex and age of animal treated

Details of animal's identification

Details of the nature of the illness

Veterinary diagnosis, recommended treatment and treatment carried out

Care and rehabilitation processes

Outcome of treatment

6. Breeding information including mating, reproductive and behavioural cycles, parenting ability and details of offspring
7. Date and cause of death including results of post-mortems
8. normal diet

Any other relevant information about the individuals for example any behavioural or dietary changes

5.3 Methods of Identification

Unless distinguishing marks or features, documented in the animal records, can easily identify an individual animal, a permanent method of identification is required to identify that individual, if requested by the Director-General or an authorised inspector.

Preferably two methods of identification should be used in case one method fails.

The attributes of effective identification techniques may include:

- being permanent.
- positively identifying the animal as an individual.
- being easy to apply.
- not unreasonably damaging the individual.
- having a relatively painless application.
- not interfering with the animals' mobility.
- being adaptable to modern data retrieval systems.
- being clearly visible.

– being unalterable.

Different identification methods that can be used on Persian Onagers include:

– Passive Integrated Transponders (PIT) Tags (most species).

– ear tags.

– tattoos.

(http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0019/121564/general-animal-exhibition-standards.pdf)

5.4 Routine Data Collection

Data should be collected and recorded on a regular basis. This forms a record of everything that happens within an institutions collection and can be used as a guide or reference and accessed when necessary. This data should be made available to other institutions.

6.0 Feeding Requirements

6.1 Wild Diet

Onagers are non-ruminant, non-selective grazing animals.

This species eats grasses when available, but will browse on shrubs and trees at other times or in drier habitats. They have been seen feeding on seed pods and breaking up woody vegetation with their hooves to get at more succulent herbs growing at the base of the woody plants. In Mongolia they eat snow in winter as a water substitute, and they often dig holes in dry riverbeds to obtain water. Even though they are very well adapted for life in the desert, they must live near a water source and need to drink to survive.

6.2 Captive Diet

Onager nutritional requirements are extrapolated from the domestic horse. They will consume between 1.5% and 3% of their body weight daily and require 12-14% protein in their diet.

Exhibit Group 1.5.0 at Taronga Western Plains Zoo get 2.5kg of lucerne chaff a day each. The male 1.0.0 in a separate yard gets 2.5kg of lucerne hay and 1kg of lucerne chaff.

NOTE: Graze is available on exhibit.

Browse should be offered daily: Salt bush, kurrajong, casuarina and eucalypt are suitable.

Clean water must be available to animals at all times.

(TWPZ Division Manual)

At San Diego Zoo's Wild Animal Park Onagers are fed hay, alfalfa and carrots.

(http://www.sandiegozoo.org/animalbytes/t-wild_ass.html)

6.3 Supplements

SUPPLEMENTS: Access to Calcium Molasses Stock blocks at ALL times.

Onagers suffer from colic and at various times, sand lube must be offered.

Dose rate is 1 scoop/75g per animal given on two consecutive days.

6.4 Presentation of Food

All food hay and chaff must be placed in appropriate troughs for hygiene reasons. Browse can be placed around exhibit or night yards on clean ground also can be hung up around yards or exhibit as enrichment item. There must be a sufficient number of troughs to give all animals equal access to feed.

Water troughs are to be checked daily and if required, drop, scrub and refill.

All feed remaining the next day must be removed from troughs. Any faeces must be removed from yard and around feed area.

General Standards for Exhibiting Animals in NSW

(http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0019/121564/general-animal-exhibition-standards.pdf)

Part 8 - Nutrition and Hygiene

Clause 36 Diet

- 1) Each animal must be offered a variety of wholesome and palatable food and water in quantities that are sufficient to provide for its good health and normal growth.
- 2) The diet must be prepared with consideration of the age, size, condition and previous history of the animals.
- 3) Nutritional advice from professional sources must be obtained in relation to the addition of food supplements to the ordinary balanced diet of animals.
- 4) Food must be unspoiled and free from chemical and bacterial contamination.

5) Food supplements must be appropriately handled and stored, and stocks appropriately rotated.

6) Care must be taken not to include food that is known to have deleterious effects to the animal.

Note

For example, improperly thawed fish can contain high levels of thiaminase, which can destroy dietary thiamine.

Clause 37 Food Quality

1) Food must be clean, fresh, wholesome, palatable and of a standard fit for consumption.

2) The food items' nutritional value must be sufficient to keep the animals healthy.

3) Food must be free of pests or disease.

4) The following must NOT be fed to animals:

a) any animal that has died from any toxic material, including euthanasia chemicals (CO₂ is acceptable), insecticides and rodenticides; or

b) animals showing clinical signs of being infected by disease; or

c) laboratory animals that have been used in those research programs that lead to the animals containing chemicals different from control animals; or

d) a diet consisting solely of muscle or organ meats; or

e) plant material that is toxic to the animals.

Clause 38 Food Preparation

1) The area in which food for the animals is prepared:

a) must be indoors or completely screened; and

b) must be constructed of materials that will withstand steam-cleaning and chemical disinfection. Walls must be non-porous and without cracks or crevices.

2) All chemical and bacterial contamination must be avoided when preparing food.

3) Thawing and preparation of the food must be done so that it retains its nutritive and wholesome qualities.

4) A toxic chemical or other harmful material must not be used or stored in the area used for preparing the food.

5) Toxic chemicals or other harmful materials must not be allowed to contaminate food provided to animals.

6) Subclause (4) does not apply to cleaning products or disinfectants used in cleaning the area, the food containers or the food preparation utensils.

7) All foods must be fed to the animals within 24 hours of removal from freezers for thawing, or properly discarded. Discarded food must not be kept in fresh food storage areas.

8) The thawed product must be kept iced or refrigerated until just before feeding.

Clause 39 Cleanliness Relating to Food and Drink

1) High standards of cleanliness must be observed:

a) by staff engaged in the preparation of food and drink for the animals; and

b) in relation to the utensils and equipment used, and adequate equipment must be provided to enable this to be done.

2) Utensils and equipment used in preparing and distributing the food and drink must be cleaned after use and kept clean when not in use.

3) Food preparation areas must be washed down daily and treated with appropriate non-toxic cleaning products.

4) Boots, aprons and brooms used in the food preparation area must be cleaned after use and kept clean when not in use.

5) Utensils and other equipment used in preparing the food and drink must not be used for any other purpose.

Clause 40 Food Storage

1) Supplies of food for the animals must be stored in enclosures in which they are adequately protected against deterioration, mould, contamination and pests.

2) Toxic substances, live animals, unrefrigerated dead animals and discarded foodstuffs must not be kept in a food storage area.

3) Stocks of food supplements must be handled, stored and rotated in a way that minimises nutritional loss.

4) Frozen food must be stored at a temperature that is not higher than 18 degrees below zero Celsius.

5) No non-food cadavers must be placed in food storage areas.

Note

Food should be protected from rodent access, as many species of mammals such as primates, elephants and tree kangaroos, are susceptible to diseases such as Encephalomyocarditis (EMC) virus (a virus which causes heart failure and is spread in the urine of feral rodents).

Clause 41 Food Presentation

1) Utensils and equipment used for the offering of food and drink to animals:

a) must not be used for any other purpose;

b) must be easy to clean and designed to avoid risk of injury to the animals;

c) must, when in an enclosure, be placed in such a position that each animal in the enclosure has easy access to sufficient food and water and the risk of contamination from soiling by the animals is minimised. The exception is where food is being used to entice animals into a catching cage, nest box or night area;

d) must be kept in a sanitary condition and, except in the case of a self-feeder, must be washed daily following use; and

- e) in the case of a self-feeder, must be inspected daily to ensure that it is working effectively and does not contain caked or unwholesome food.
- 2) Food items must be presented on an uncontaminated surface that is covered and not exposed to weather. Exception: Carcass feeding and enrichment feeds can be provided in areas that are not covered.
- 3) Where appropriate to encourage animal activity, at least some food must be scattered across substrate or included in wood chips, hay, paper, feeding puzzles or other suitable material or presented amongst the climbing structures for arboreal animals.
- 4) Activity feeds must not promote weight gain or dietary imbalances.
- 5) Only food supplied by the exhibitor may be fed to animals and visitors must be discouraged from feeding any food to animals except food supplied by the exhibitor.
- 6) The provision of live vertebrate animals as food is not permitted. With the approval of the Director-General an exhibitor may be exempt from this requirement for up to six months in relation to wild caught predatorial animals that are being fed live captive-raised fish or live captive-raised tadpoles while being trained to eat dead food items. This period may be extended if the Director-General considers it to be essential to the maintenance of the species.

Clause 42 Drinking Water

- 1) Clean potable water must at all times be available for the animals to drink.
- 2) Animals must be provided with sufficient fresh drinking water daily to meet each animal's requirements and must:
- a) be either reticulated to, or changed daily in, each enclosure; and
 - b) not be allowed to become stagnant.

7. Handling and Transport

7.1 Timing of capture

The best time to capture an Onager is first thing in the morning or last thing in the afternoon depending on the purpose of capture.

Morning is good if you want to do something in house with the animal. Late afternoon is better if you want to move the animal over a long distance. This being due to less traffic and less stress on the animal.

7.2 Catching bags

Catching bags are not useful with onager unless they are used to throw over the eyes like a towel to cause less stress on the animal.

7.3 Capture Techniques

Float Training – One simple yet time consuming way to capture the animal is to float train it.

The idea being the animal is less stressed and not drug affected. This is ideal for short trips.

However the training will take some time especially depending on the animal.

The first job is to get it fairly used to people, by feeding it through a fence once it is separated or just being near the group of animals. Next is to get the animal used to the float, just its presence at first then slowly work up to being inside it by putting hay and browse in there. It then needs to be conditioned to stay in there while there are people moving around outside making noise and finally having the door closed.

It can be time consuming but it is a much better idea than chemically restraining your animal whenever it needs to be moved.

Chemical restraint

Sometimes it is necessary and safer to chemically restrain an onager especially if it is for medical purposes or a long trip. An opioid is suggested for this large mammal. This should always be administered by a trained veterinarian.

7.4 Weighing and Examination

Training and Conditioning

An onager can be trained or conditioned to walk into a race and over a large set of scales with much persistence. This is less stressful on the animal in the long run and can help in providing regular information on the animal's weight. Visual examination can occur whilst animals are in a race or holding yard.

Chemical restraint

The animal can be weighed whilst under the effects of an anaesthetic and on a stretcher. It is not recommended that an animal be anaesthetized for the sole purposes of weighing this is just an option whilst the animal is undergoing another procedure. Whilst an onager is under anaesthetic it is possible to do a thorough physical examination of the animal including bloods and x-rays.

7.5 Release

Float release

If an onager is travelling by float then the best way to release it into the yard is to back the float up the gates ensuring there are no gaps for it to escape back through the gates and open the float allowing the onager to exit into the enclosure in its own time.

There should be no obstacles in the way so as to ensure the onager does not injure itself upon release.

Chemical release

An onager under chemical influence should be positioned in its yard or enclosure depending on where the procedure took place in an open space with no hazards. The yard/enclosure should be cleaned of all unnecessary debris or equipment and all staff except the vet and/or vet nurse should leave. Upon being given the reversal to the drug ALL staff should leave the yard/enclosure and monitor the animal from outside. These procedures of course are ultimately up to the veterinary staff of the institution.

7.6 Transport Requirements

Domestic Transport

Horse floats can be used for domestic travel such as the one below. The timing and release principles still apply. It is still recommended to travel one animal at a time however if training has taken place and it is a short distance 2 animals can be considered especially mother and foal.



International Transport

IATA regulations state that the height and width of the container must allow the animal to stand erect with its head extended. The size of the container must sufficiently restrict movement so that the animal cannot turn around and in doing so trap or injure itself, nor have the space to kick and damage the container.

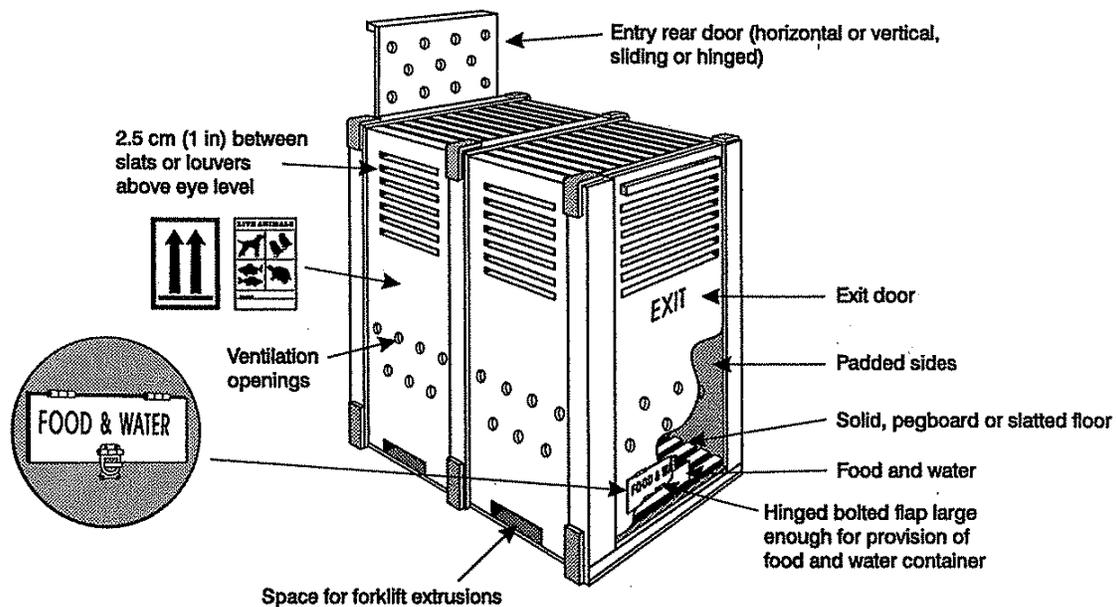
7.6.1 Box Design

Box height – 2.4m

Box length – 3.2m

Box width – 1.4m

EXAMPLE:



Frame must be made of a minimum of 2.5sm solid wood or metal parts bolted or screwed together. Because the animal exceeds a weight of 60kg additional metal framing must be present around the whole container.

Sides suitable plywood or similar material must closely line the frame to a level slightly above the animals eye over which there must be a louvered or slatted area for ventilation extending to the roof. The interior must be completely smooth.

Floor the base must be solid and leak proof, there must be either pegboard or slats bolted to the solid base for a firm foothold. A droppings tray must be provided under the pegboard or slats to prevent the excreta escaping.

Roof must be slatted.

Doors hinged or sliding entry and exit doors must be provided, they must be fastened in such a way that they cannot be accidentally opened. They must have similar ventilation opening as on the sides.

Ventilation louvers or slots, with 2.5sm spacing between the louvers/slats or holes, with a minimum diameter of 2.5cm, must be present above eye level on all four sides and the roof of close boarded containers. Slots and holes must be covered with a fin wire mesh that will not allow any part of the animal, including horns, to protrude.

Spacer bars/Handles must be made to a depth of 2.5sm and formed from the framework of the container.

7.6.2 Furnishings

Feed/Water containers must be provided with outside access from a hinged bolted flap that must be large enough for the entry of a large water dish and/or quantities of appropriate food such as grass hay, roots etc.

It is recommended that absorbable material is placed underneath container such as **wood shavings** to prevent spillage of excreta.

7.6.3 Water and Food

Food should be provided as the normal ration before being placed in the container. It is advisable that access to water be restricted no less than 2 hours before loading into the container.

Animals do not normally require additional feeding or watering during 24 hours following time of dispatch.

If feeding is required during transport or due to an unforeseen delay food must be provided through feed and water containers in transport box.

7.6.4 Animals per box

One onager per box is the best way to transport this species. If there are a mother and foal it is recommended that unweaned animals are not transported. Animals must only be transported once separated from the mother and able to travel on their own.

7.6.5 Timing of transport

For transportation it is recommended that the animal be boxed and moved in the late afternoon/overnight. There is less traffic and less stress on the animal. However this will need to suit timing of flights so the animal is not being contained longer than necessary.

7.6.6 Release from the box

Release should happen as soon as possible once the animal has reached its destination. The box should be placed at the opening of the holding yard with no gaps around and opened to allow the animal to exit in its own time. Gates should be closed and the box removed once the animal has settled into the yard. There should be no clutter in the yard only necessary furnishings such as food and water trough and shelter whilst releasing the animal from the box.

8.0 Health Requirements

8.1 Daily Health Checks

- Observations are generally undertaken during cleaning and feeding each morning and include:
 - ⇒ All limbs appear to be moving freely.
 - ⇒ Feeding well.
 - ⇒ Eyes clear and fully open.
 - ⇒ General appearance - body condition and condition of coat.
 - ⇒ Discharges - any nasal, ocular or cloacal discharges should be noted.
 - ⇒ Changes in behaviour.
 - ⇒ Consistency of faecal material - is it sloppy, not the normal colour or contains blood?

8.2 Detailed Physical Examination

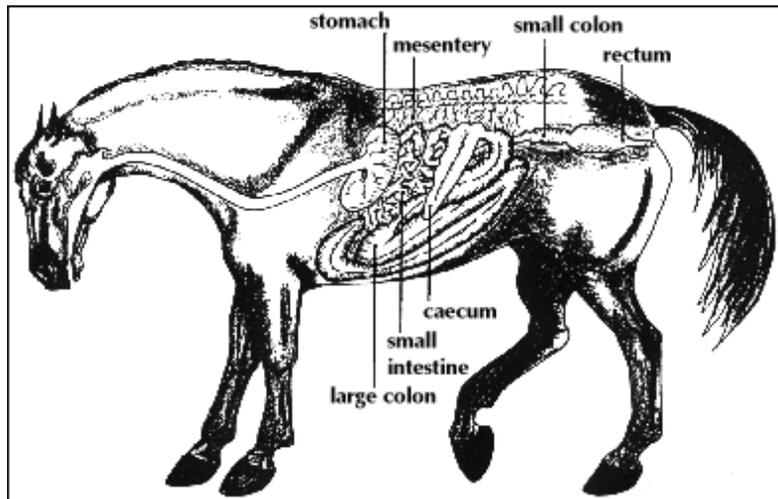
- When undergoing a detailed physical examination usually safest by veterinarian under anaesthetic the key things to look for are:
 - ⇒ Blood glucose levels
 - ⇒ Urine glucose
 - ⇒ Enzymes which reveal liver function
 - ⇒ Protein levels indicate well being
 - ⇒ BUN which indicates kidney function
 - ⇒ Faecal float looking for worms
 - ⇒ Good general dental health
 - ⇒ Body condition
 - ⇒ Hoof condition
 - ⇒ Eye condition
 - ⇒ Body Temperature
 - ⇒ Look inside ears for general muck and colour
 - ⇒ Pregnancy test if female may be in foal

8.3 Routine Treatments

- Key things to keep on top off and continually monitor are:
 - ⇒ Presence of worms. This can be determined by routine faecal floats and dealt with using equiban or similar product as prescribed by veterinarian. Treatment is always followed up another faecal float in 2 weeks.
 - ⇒ Tetanus vaccinations should be administered every 5 years.
 - ⇒ Equine Flu Vaccination should be administered if animals are held in a country with this disease.

8.4 Known Health Problems

- Common ailments to look for in the Persian Onager are:
 - ⇒ Onagers are known for poor **dental health** and this should be monitored regularly. **Signs** to watch for are poor appetite, weight loss and visually checking inside mouth. **Treatment** is usually fairly invasive involving a general anaesthetic and specialist dental instruments.



- ⇒ **Sand Impaction or Colic** is a common and painful problem where the animals eat dirt and sand whilst eating hay off the ground or if there is an underlying problem. This can cause the animal severe cramps and abdominal pain as it blocks the gut and can lead to death in the animal. This condition can be prevented with the use of sand lube in the diet.
- ⇒ Other forms of **colic** in Onagers are **Gas Colic or Spasmodic Colic**. Gas colic is simply a build up of gas which stretches the intestine causing pain. This type of colic will resolve itself fairly easily with appropriate treatment by veterinarians. Spasmodic colic is an increase in intestinal contractions this can be painful for the Onager and is usually fairly easily treated by vets.

Signs of Colic

- ✓ lying down more than usual
- ✓ getting up and lying down repeatedly
- ✓ standing stretched out
- ✓ standing frequently as if to urinate
- ✓ turning the head towards the flank
- ✓ repeatedly curling the upper lip
- ✓ pawing the ground
- ✓ kicking at the abdomen
- ✓ rolling

(<http://www.equusite.com/articles/health/healthColicFacts.shtml>)

8.5 Quarantine Requirements

When **acquisition** a new animal it is advisable to quarantine it before placing it in with others. This Prevents the possible spread of disease and parasites.

Some points to follow with quarantine are:

- ⇒ The animal should be in general good health before it is sent.
- ⇒ The animal should undergo a minimum 30 day quarantine period.
- ⇒ Routine blood samples should be taken during quarantine.
- ⇒ 3 consecutive negative faecal floats taken at weekly intervals.
- ⇒ Animal should be in good general condition before released into herd or placed near other Onagers.

When **sending** animals to other zoos the general rule is to follow whatever requests the other zoo has. It is a good idea to perform all the above tests such as bloods and faecal float before sending the animal anyway.

9.0 Behaviour

9.1 Social Behaviour

Territorial defense social systems seem to be the most common for onagers. A male guards a prime territory, and groups of females migrate between guarded territories, depending on their habitat and mate preferences. Some females remain in one guarded territory while others choose to move amongst several territories. Immature males sometimes form all-male groups before reaching breeding age. However, scientists have also observed onagers forming harem groups. In a harem-style social system, a dominant male guards a group of females from other males.

<http://nationalzoo.si.edu/ConservationAndScience/ReproductiveScience/WildEquids/MeetTheEquids/fact-onager.cfm>

9.2 Reproductive Behaviour

Oestrus Detection

Given the disposition and temperament of the *Equus hemionus onager*, detecting oestrus in the mare can only be achieved with good observation.

Mares in heat will show one or several of the following signs:

- interest in the stallion
- allowing contact and advances from the stallion
- winking (opening and closure of the vulvar lips)
- urinating
- tail raising
- squatting or standing in the breeding season

Mares in diestrus (not in heat) will not tolerate the stallion's advances and may:

- pin their ears
- squeal
- strike
- kick
- try to get away or rear

Mating Behaviours

Proceptive behaviour The mare backs into the stallion, or stands in front of him tail deviated. She may urinate or evert the clitoris.

Erection of the male's penis

Mounting The stallion may rest his chin on the mare's back to test her willingness to stand, then rear and place his forelimbs anterior to the mare's pelvis.

Mating face See in females. Ears turned back but not flattened, lips relaxed.

Intromission of the penis into the vagina

Pelvic thrusting by the stallion

Ejaculation Cessation of thrusting, marked by tail flagging (raising the lowering of the tail).

Dismounting

Aggression and Related Behaviours

- Avoidance / retreat** Movement that maintains or increases an individual's distance from an approaching animal. The head is usually held low and ears turned back. The retreat can be at any gait but typically occurs at the trot.
- Bite** Opening and rapidly closing of the jaws with the teeth grasping the flesh of another animal. The ears are pinned and lips retracted.
- Bite threat** Similar to a bite except that no contact is made. The neck is stretched and ears pinned back as the head swings toward the target animal, thus giving the appearance of a warning to maintain distance. Bite threats are typically directed toward another animal's head, shoulder, chest or legs and may be performed during an aggressive forward movement, such as a lunge, or toward the hind leg of an animal being chased or herded.
- Chase** One animal pursuing another, usually at a gallop in an apparent attempt to overtake, direct the movement of, or catch up with another animal. The chaser typically pins the ears, exposes the teeth, and bites at the pursued animal's rump and tail. The animal being chased may kick out defensively with both rear legs.
- Ears laid back / pinned** Ears pressed caudally against the head and neck. Typically associated with intense aggressive interaction.
- Grasp** Similar to a bite, but a hold is maintained with the jaws and teeth, usually on the crest of the neck, or on a foreleg above the knee or hind leg above the hock.
- Head threat** Head lowered with the ears pinned, neck stretched or extended toward the target animal and, often, the lips pursed.
- Herding** Combination of head threat and ears laid back with forward locomotion, apparently directing the movement of another animal.
- Kick** One or both hind legs lift off the ground and rapidly extend backwards toward another animal, with apparent intent to make contact. The forelegs support the weight of the body and the neck is often lowered.
- Kick threat** Similar to a kick, but without sufficient extension or force to make contact with the target animal. The hind leg usually lifts off the ground and under the body in tense readiness, usually with no subsequent backward extension of the hind leg(s). The tail may lash in accompaniment and/or he may vocalise in a harsh squeal.
- Nip** Similar to a bite, but with the mouth less widely opened and the teeth closing on only a small piece of flesh.
- Push** Pressing of the head, neck, shoulder, chest, body or rump against another in an apparent attempt to displace or pin the target animal against an object.

Behavioural Events

Flehmen

Head elevated and neck extended, with eyes rolled back, the ears rotated to the side, and the upper lip everted exposing the upper incisors and associated gums. The head may roll to one side or from side to side.

Communications

Neigh (whinny) A long vocalisation of high amplitude that varies in frequency.

Nicker Usually quieter than a neigh.. Often seen between a mare and foal, or when a stallion courts a mare.

Squeal Usually heard during aggressive interactions.

Snort Short forceful exhalations from nostrils.

Fear snort or blow Explosive snort with the nostrils flared and head high. An alarm call.

Grunt or groan Low pitched vocalisation sometimes indicating discomfort.

Excerpt from Breeding Action Plan at Western Plains Zoo

9.3 Behavioural Problems

Onagers are a restless and flighty animal. They cannot be domesticated and require a lot of conditioning work to make it easier to work with these animals. If the time is put in this can be a rewarding process just remember to start small and reward positive or good behaviour.

9.4 Behavioural Enrichment

Onagers are easily enriched. Things such as horse balls, browse placed around the exhibit, Fruit and Vegetable scatters and conditioning sessions are all great ways to enrich the life of a captive Onager. It is best if one of these things can be done daily to keep the mind active and change the day in day out routine of a captive animal.

9.5 Introductions and Removals

Introductions for this species always begin with fence contact. The animals need time to get to know other animals before joining the group. This prevents a lot of injury during the introduction process. It is a good idea to give fence contact for about a week and then depending on how the Onagers are behaving introduce the Onagers in a large open area so that they have space to sort out their issues. Onagers will continue to show signs of aggression through the fence and until this has stopped and only positive signs are appearing do not introduce the animals.

Removals from the group usually involve separating an animal which can sometimes be opportunistic or other times be conditioned.

9.6 Suitability to Captivity

Onagers can be held successfully in captivity so long as provided with the right environment. There needs to be a lot of space to have a large open enclosure and suitable access to shelter, shade, food and water. Holding areas or Night yards need to be accessible. This species is not suitable for a small city zoo. It is better suited to a large open range zoo.

10.0 Breeding

10.1 Mating System

The social structure of this species appears to be relatively fluid, with females and their offspring forming small, temporary aggregations of around 2-5 individuals. Descriptions of male breeding strategies vary, but it seems likely that males defend resources rather than the females themselves. Dominant males are thought to defend territories close to a permanent water source during the breeding season. This means that they have exclusive access to visiting females and can mate with all of the females within their territory. This is not a harem-based mating system because some females remain in a single territory throughout the breeding season, while others move freely between territories. This indicates that female movement is dependent on resource availability as well as mate preference.

http://www.edgeofexistence.org/mammals/species_info.php?id=14

10.2 Ease of Breeding

Breeding has been relatively successful in captive institutions. So long as approached with the correct strategies breeding can be easily accomplished. It is recommended females be kept in a herd and separated from the male. During breeding season allow the male fence contact with the females.

10.3 Reproductive Condition

It is recommended that Onagers be in peak condition prior to breeding. Good quality feed should be used and if necessary the quantity could be slightly increased. Females reach sexual maturity at 2 years of age. Males are thought to reach sexual maturity at 2 also however they rarely breed before the age of 4.

<http://nationalzoo.si.edu/ConservationAndScience/ReproductiveScience/WildEquids/MeetTheEquids/fact-onager.cfm>

10.4 Techniques used to control breeding

The best method of controlling breeding is to separate the male from the female group. If the animal is not suitable for ever breeding the male can be castrated but this is irreversible and not recommended unless necessary.

10.5 Occurance of Hybrids

It is possible to cross the Onager with other species of Wild Ass however it is not a widely accepted practice and hard to do in a captive situation when there are not many species held in captivity. It is possible to cross Onager with donkeys. However crossing with horses and zebra generally result in sterility.

[http://arts.anu.edu.au/grovco/Horses%20and%20asses.ppt#319,72,Donkey x onager hybrid bred in Tierpark Berlin](http://arts.anu.edu.au/grovco/Horses%20and%20asses.ppt#319,72,Donkey%20x%20onager%20hybrid%20bred%20in%20Tierpark%20Berlin)

10.6 Timing of Breeding

Onagers usually mate around June to August. Females have a short estrus period of 3-5 days. Foals can be born any time from May to September depending on when mating occurred. It is not impossible for mating to occur at any time however.

http://animaldiversity.ummz.umich.edu/site/accounts/information/Equus_hemionus_onager.html

10.7 Breeding Age

Female Onagers become sexually mature at 2 years of age. It is thought that male onagers also become sexually mature at 2 however they do not usually produce young till 4 years of age. The end of reproductive age in female onagers varies between the individuals however late teens would be the average. Males in theory should be fertile for the rest of their lives however with

age fertility would decrease slightly.

10.8 Frequency of Breeding

It is possible for Onagers to breed every 2 years. There is an 11 month gestation period and the foal will suckle for approximately 1 to 1½ years.

11.0 Artificial Rearing of Young



11.1 General Rules

- All neonates (newborn) to be given **colostrum for the first 24-36** hours where possible. Equids such as the Onager should receive equine colostrum.
- Milk formula should be gradually increased to 100% strength concentrations as recommended. Eg. Begin at 25 % supplemented with vytrate and increase by 25% at 24 hour intervals until 100% is reached. Always use pre-boiled water to make formulas.
- Young should be fed **10-20% of their bodyweight** in milk formula each day, divided equally between feeds. If young fails to take in enough formula each day then it should be tube fed until intake from the bottle is adequate.
- Always **weigh** the young immediately and continue to monitor weight every 2nd day until satisfied it is consistently gaining then once a week is enough.
- Devise a schedule and stick to it routine is extremely important begin with one person feeding and introduce others as soon as possible to prevent the Onager imprinting on one person.
- The onager young need to be stimulated to urinate and defaecate after each feed by gently patting the area. Always ensure the animal is clean when finished.
- Always wash thoroughly and sterilise bottles and teats in an approved solution such as Milton. Always use clean utensils and rinse with pre-boiled water before use.
- Ensure bedding is clean after every feed if it has been soiled then replace it. Do not use a wipe that has been around the anal area around the face of the onager. Always clean the mouth and surrounding areas after each feed.
- Feed milk formula at body temperature. To heat the milk put the required amount into a bottle and sit the bottle in a jug with hot water gently swirl the bottle every few minutes to ensure the milk is heated evenly and there are no hot spots. Once suitable temperature has been reached feed the foal immediately to prevent cooling of the bottle. It may help if the foal is still learning to drink to have the jug of warm water there when feeding so you can keep the milk warm.
- Always keep young foals warm and away from draughts a suitable yard should have soft bedding and an overhead heater that the foal cannot reach. Room should be provided for the foal to move around and practice using its legs.
- Offer shallow water and a variety of food such as hay and a few chopped fruits and vegetables as soon as appropriate.
- Allow times of the day for exercise it is important for foals to use their legs as soon as they can and then maintain and strengthen their muscles for necessary growth.

- And most importantly record all data such as formula type, percentages, amounts consumed, times, weights, type of teat and all other relevant information including defaecation, urination and behaviour.

11.2 Formula Types

There are 3 types of formula for raising equids. Biolac, Di-Vetelact and Wombaroo. You should choose which formula you are going to use and stick to it unless you are having problems with the formula and need to change.

Remember horse's milk is low in fats and proteins about 1.3% and 1.9% respectively, so a high fat diet is going to cause problems stick to the appropriate formulas and mix rates and you should be safe.

Foals require up to 20 litres of liquid a day. So always have a shallow trough of water that the foal can drink from if necessary. Below are the contact details for these companies.

Biolac

PO Box 93
BONNYRIGG NSW 2177
Phone / Fax: (02) 9823 9874
Website: www.biolac.com.au

Sharpe Laboratories Di-Vetelact

Animal Health Division
12 Hope Street
ERMINGTON NSW 2115
Phone: (02) 9858 5622
Fax: (02) 9858 5957

Wombaroo Food Products

8 Oborn Road
MT BARKER SA 5251
Phone (08) 8391 1713
Website: www.wombaroo.com.au

11.3 Feeding

Foals require feeding between **5 and 10 times daily**. So divide evenly what the foals total daily intake should be with the number of feeds you are going to offer and this gives you the amount required at each feed.

Milk

Milk can be made up according to directions and stored for up to 24hours in the fridge. Always use pre-boiled water to make up the formula. To reheat place required amount in a bottle and place in a jug of hot water. Swirl the milk every minute to ensure the milk is heated evenly and test regularly to ensure you do not over heat. Once body temperature has been reached it is ready to feed to the foal.

Teats

Choose an appropriate teat such as a horse or calf teat and the appropriate size and place a small hole in the top using a sterilised needle. Do not make this hole too large or the calf will not be able to cope and possibly get milk in its lungs. Start small and if this is not enough take it a step at a time. Place the teat over the top of the bottle and ensure you hold onto the teat whilst feeding.

Tips for feeding

To encourage sucking from a bottle you may need to use your finger to guide the teat into the foal's mouth it will soon get a taste for the milk and realise what to do.

Sterilising

When the foal has finished feeding it is very important the bottle is washed and sterilised in Milton or another type of steriliser.

Lapping

Once the foal is confident with the bottle or the amount of milk required is outgrowing the bottle you can try to get the foal lapping from an appropriate feed bucket. You can do this by placing the milk in the bucket and gently pressing the foals head in so it can taste the milk. (Never push the head far enough to cover the nostrils)

After a few tries the foal should pick this up.

11.4 Weaning

Foals can be offered solids from 2 weeks of age. These include hay and chaff. Some fruits and vegetables can be offered also with veterinary approval. Generally as the foal begins to eat more solids the amount of milk intake will drop. However you can start weaning from 3 months up to 6 months of age. Once you have begun this process the foal's weight and condition must be monitored closely.

It is a good idea to start providing browse for the foal to eat from about 5 weeks of age. This will help with the weaning process.



12.0 Acknowledgements

Thanks to the Taronga Western Plains Zoo Life Sciences and Veterinary Dept

Thanks to Monique Counihan for the use of her images and perr com. 2009

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- <http://www.iucn.org/themes/ssc/sgs/equid/AsMap.html>
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15.0 Appendix

Appendice I MSDS Red Gum Disinfectant

Page 1 of 2

MATERIAL SAFETY DATA SHEET

CUSTOM CHEMICALS INTERNATIONAL PTY LTD Date of Issue: 13/4/05

103-107 Potassium Street, Narangba QLD 4504 Telephone: 07 3204 8300 Facsimile: 07 3204 8311

PRODUCT : RED GUM DISINFECTANT

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO THE CRITERIA OF WORKSAFE AUSTRALIA.

Product Code: 0010053

Other names: N/A

UN Number: Not regulated Shipping Name: None allocated

Hazchem Code: None allocated DG Class : Not regulated

Subsidiary Risk: None allocated Poison Schedule: None allocated

Packaging Group: None allocated

PHYSICAL DESCRIPTION/PROPERTIES

Use: Used as a disinfectant, a deodorant and a cleaner for hygiene standard maintenance.

Appearance : Transparent red, non viscous liquid Odour : Eucalyptus scent

Specific Gravity: Not applicable Vapour Pressure: Not determined

Solubility in water: Not applicable Flash Point : Not applicable

Boiling/Melting Points: Not applicable Flammability Limits : Not applicable

Other Properties: Nil pH : 11.5 – 12.0

INGREDIENTS

Chemical CAS Number Proportion (w/v)

Quaternary ammonium compound 6824-85-1 1.5%

Eucalyptus Oil 8000-48-4 0.4%

Materials not considered hazardous Not required >90%

FIRST AID:

Swallowed: DO NOT induce vomiting. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; ie, becoming unconscious. Give water (or milk) to rinse out mouth. Then provide liquid slowly and as much as casualty can comfortably drink. Seek medical advice.

Eye: Immediately irrigate with copious quantities of water for at least 15 minutes. If pain persists or recurs, seek medical attention.

Skin Contact: Remove contaminated clothing and wash affected area with soap and water.

Inhaled: If fumes or combustion products are inhaled: remove to fresh air. Seek medical advice.

First Aid Facilities: No special requirements

Advice to Doctor: Treat symptomatically.

WORKSAFE AUSTRALIA CLASSIFICATION

CATEGORY : Not required

RISK PHRASES : NA

SAFETY STATEMENT: NA

Page 2 of 2

PRODUCT: RED GUM DISINFECTANT

HEALTH EFFECTS

ACUTE: A low hazard material generally considered safe if handled in accordance with this MSDS.

Swallowed: Considered mildly toxic. Acute oral LD50's in rats quoted as 350 – 600 mg/kg of the 100% quaternary ammonium compound. Irritation of the mouth and gastrointestinal tract may occur if high concentrations of undiluted product is swallowed.

Eye: A moderate eye irritant.

Skin Contact: Very low irritation. Extended or prolonged contact may lead to dermatitic effects.

Inhaled: Generated mists of the product may irritate the respiratory system.

CHRONIC: No data.

PRECAUTIONS FOR USE:

Exposure Standards: No value assigned for the specific material by the National Health and Medical Research Council or

by the National Occupational Health and Safety Commission (Worksafe Australia).

Engineering Controls: No special requirements

Personal Protection: Use good Occupational work practice. The use of protective clothing and equipment depends on the degree and nature of exposure. The following should be available: Gloves, safety eye glasses (particularly when pouring undiluted product).

Flammability: Non-flammable liquid.

SAFE HANDLING INFORMATION :

Storage and Transport: Not defined as a Dangerous Good by the Australian Code for the Transport of Dangerous Goods by

Rail and Road. Store in a cool, dry place and out of direct sunlight. Store in a well ventilated area.

Keep dry – keep containers closed at all times.

Spills and Disposal: Prevent large spills from entering sewer systems, waterways, etc. Mop up with absorbent material.

Collect and seal in properly labelled containers for disposal. Small spills may be rinsed away with water. Disposal – Refer to State Land Waste Management Authority. Normally suitable for disposal at approved land waste site.

Fire/Explosion: Non flammable.

Other information: Nil.

CONTACT POINT: Industrial Chemist - phone: 07 3204 8300

This material safety data sheet is compiled from the best information currently available to the company. The company

accepts no responsibility for the accuracy of the information contained in this data sheet, or any results obtained by customers

or end-users. Good industrial hygiene should always be used when handling chemicals.

END OF MSDS

Appenice II F10 MSDS

MATERIAL SAFETY DATA SHEET

COMPANY DETAILS MANUFACTURER:

AUSTRALIAN DISTRIBUTOR: Health and Hygiene (Pty) Ltd
COMPANY: Chemical Essentials (Pty) Ltd P O Box 347, Sunninghill 2157,
Address: 13 Abelia Str, Doncaster East, South Africa.
Victoria 3111 Tel:+27 11 474-1668
Emergency Telephone number:+03 9841 9901 Fax: +27 11 474-1670
Fax: +03 9841 9909 e-mail: info@healthandhygiene.co.za

IDENTIFICATION

PRODUCT NAME: **F10 SUPER CONCENTRATE DISINFECTANT** UN Number: None
D G Class: None

Hazchem code: None

Poisons Schedule: 5

HAZARDOUS ACCORDING TO CRITERIA OF WORKSAFE AUSTRALIA IN THE PACK CONCENTRATE ONLY (eyes and skin irritant)

USE: Biodegradable multi purpose Disinfectant for all hard surfaces, equipment and airspaces

PHYSICAL DESCRIPTION/PROPERTIES

Appearance: Clear, colourless liquid, with a slight natural odour.

Boiling Point: 110 C

Vapour Pressure: Not known

Specific Gravity: 1.00

Flash Point: Not flammable

Flammability Limits: Not flammable

Solubility in water: Soluble

INGREDIENTS

CAS Number Quantity (w/w)

Benzalkonium Chloride 68424-85-1 5.4%

Biguanide 27083-27-8 0.4%

Ingredients not determined to be hazardous to 100%

HEALTH HAZARD INFORMATION

HEALTH EFFECTS:

Acute

SWALLOWED: Low. Substantial ingestion may cause irritation to mouth, throat and digestive tract.

EYE: Low. Will cause irritation but not serious damage.

SKIN: Low. Concentrate may act as mild degreasant to sensitive skin.

INHALED: Low. No significant hazard.

Chronic

INHALED: Low. No significant hazard

FIRST AID

SWALLOWED: DO NOT induce vomiting. Give milk or water to drink. Seek medical advice where necessary.

EYE: Rinse eyes with water. Seek medical advice where necessary.

SKIN: Wash affected area with soap and water.

INHALED: Non-toxic. Avoid long term inhalation of neat liquid. Remove to fresh air.

FIRST AID FACILITIES: Contact a doctor or Poison Information Centre (phone 131126)

ADVICE TO DOCTOR: Treat symptomatically

PRECAUTIONS FOR USE

EXPOSURE LIMITS: No data found

Engineering controls: None required

PERSONAL PROTECTION: Not required

FLAMMABILITY: Not Flammable

SAFE HANDLING INFORMATION

Storage and Transport: Store below 30 °C in dry conditions

SPILLS AND DISPOSAL: Soak up on an inert material e.g. dry earth and dispose of in an area approved by local authority by-laws.

Flush small spills with copious amounts of water

FIRE/EXPLOSION HAZARD: The product is not flammable or explosive.

OTHER INFORMATION: Ensure good industrial hygiene.

DO NOT mix with soaps or other chemicals.

CONTACT POINT: Managing Director, +03 9841 9901

Chemical Essentials Pty Ltd

KEEP OUT OF THE REACH OF CHILDREN

Issue number: 2

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