

Bobtail Rehabilitation

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ABSTRACT: Reptiles have very specific needs especially when they are sick or injured. Good nursing care must be in conjunction with correct housing, diet and medication, which is tailored to the species' needs.

Bobtails make up more than 10% of all species admitted to Kanyana each year. By providing a dedicated ward for sick bobtails, 85% are successfully treated and returned to the wild.

Modern dressings and supportive care have greatly increased the recovery time of trauma cases with treatable wounds. Assessing wounds at the initial examination into those that are or are not treatable, is time and resource saving but ultimately is an animal welfare issue. Some injuries in bobtails are, by nature of their anatomy, not treatable.

Notes on nebulising flu cases, fluid and diet charts, temperature dependant feeding, anatomy diagrams, tube feeding techniques and suitable housing requirements accompany notes on live-birth information of this lovable large skink that has evolved to have very large young, well developed placentas and a long gestation period.

Introduction

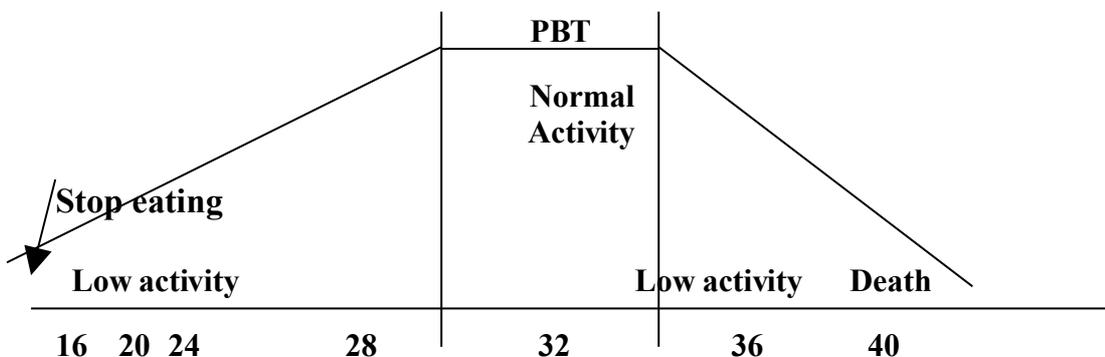
Bobtails have evolved over millions of years and have adapted to changes in their environment. Captivity rarely duplicates the wild and it is up to us to provide the basic requirements and the best care to ensure that the animals can heal and return to their life in the wild. To do this we need to understand how bobtails function.

Anatomy And Physiology

Body temperature

Although generally believed to be cold-blooded creatures, reptiles require warm body temperature to function. By seeking out or avoiding sunlight, they can maintain the temperature at which they function the best - this is called their *Preferred Body Temperature (PBT)*.

Bobtails PBT is 28° - 32°C



In warm climates bobtails are active all year round but in cooler areas they become dormant in winter. Food consumed in the summer is stored in the tail and fat pads inside the abdomen.

They stop eating when the minimum overnight temperature drops below 15°C, and become inactive at temperatures below 10°C emerging briefly on sunny winter days to bask but not to eat. As the air temperature drops so does digestive enzyme activity so if they eat the food will rot in their gut and this would be fatal. Because they don't use up energy to generate heat, they don't need to eat as often as mammals; most wild bobtails eat 2–3 times a week when they are active. In fact they can go for many months (6-12) without food. True starvation occurs when they are immobilized through illness or injury and are unable to eat and store fat during the warmer months. Bobtails in care need to be warmed to their PBT before they can be fed, and kept at this temperature for many days until digestion is complete.

Sloughing (ecdysis)

Reptile skin is very thin and covers the tough scales in a continuous layer. It should be cleaned carefully and never scrubbed with abrasive agents or brushes. Reptiles need to shed their skin as they grow and gain weight. The whole process takes from 10-14 days and involves many hormonal changes, which influence appetite, fluid retention and temperament. Humidity is very important at this time to ensure the sloughed skin does not harden and cut into the new soft skin underneath. We can assist by placing large shallow dishes of water and rough rocks inside the vivarium. Never pull un-sloughed skin off the body as this can damage the new layer underneath and result in an incomplete separation of the old skin (Dysecdysis). If this occurs, soak the animal in a dish of water containing a non-toxic disinfectant (F10® 1:500 dilution).

Kidneys & excretion

Reptiles' body chemistry is complex due to many adaptations to arid conditions. Bobtails are able to retain electrolytes in their blood even when dehydrated. For this reason 0.9% Saline is used for fluid replacement instead of Spark or Hartman's solution that contain higher levels of electrolytes.

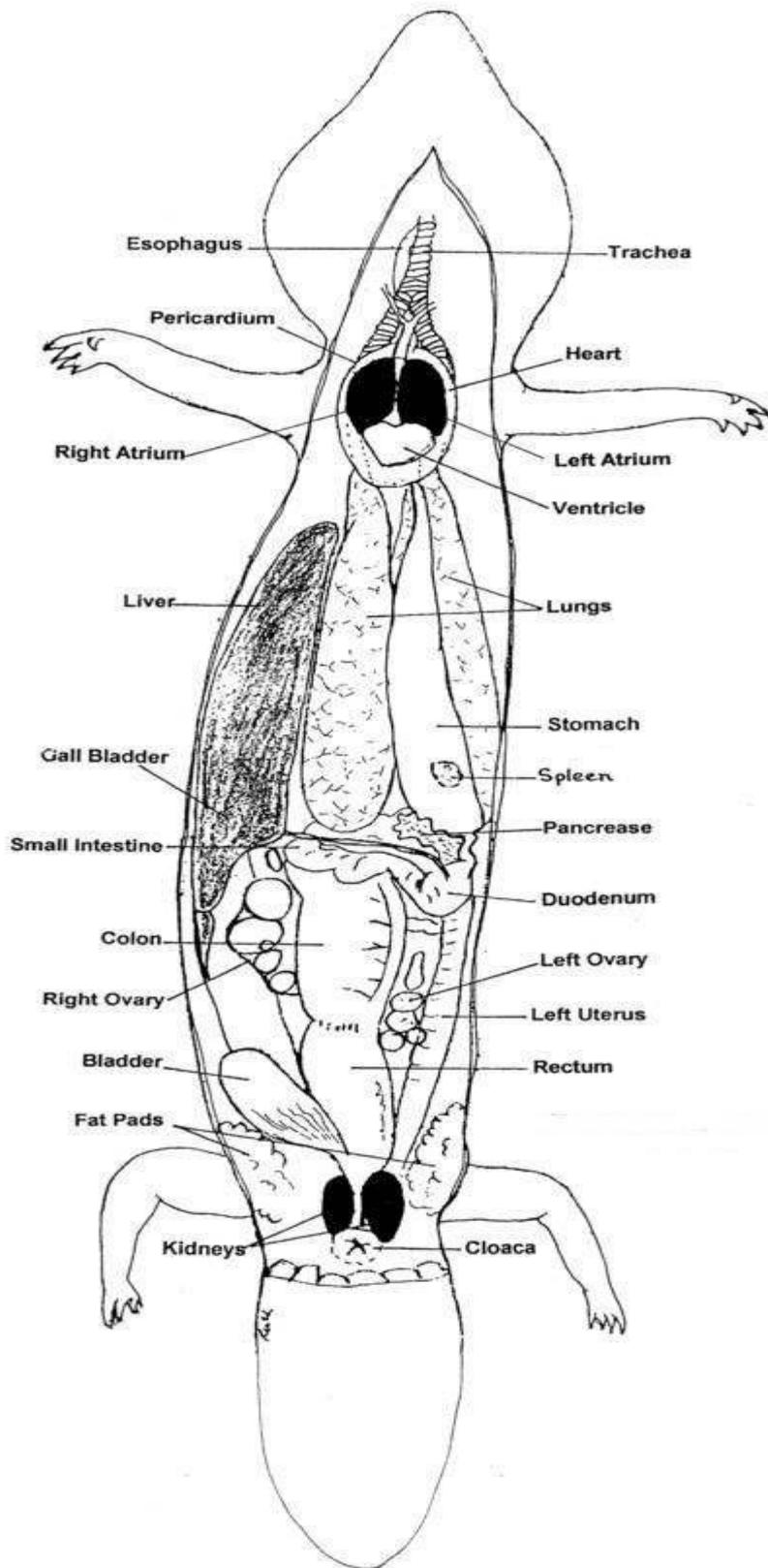
Scientific studies indicate that reptile circulation is different in the lower half of the body. Blood passes through the kidneys before going to the heart and circulating to the rest of the body. Medication injected into the back legs could therefore be excreted before going into circulation so *it is best to use the upper body when giving medication by injection.*

Breathing

Bobtails do not have a diaphragm and breathe by moving their ribcage in and out to inflate their lungs, which are thin, windsock shaped membranes. Like most reptiles, bobtails have a slow respiration rate and can survive without oxygen for long periods. If activity increases, instead of panting a bobtail can extend its lungs to the full body length thereby increasing the surface area for oxygen exchange.

They use their tongue to “smell” the air. The tongue then passes information to a sense organ in the roof of their mouth.





ANATOMY OF THE BOBTAIL SKINK

Behaviour

Bobtails are diurnal, slow moving creatures. A bobtail's defense is bluff and decoy. The hissing, while showing a wide gape and blue tongue, is meant to frighten away predators. If this doesn't work the bobtail will curl its body around and present the tail as a decoy. Often dogs will bite the tail saving the head from more damaging injury.

Breeding & Life Cycle

Bobtails are monogamous and mate in early summer and give birth to 1-3, usually 2 large, live young in late autumn. Gestation is about 5 months (150 days) and a large yolk sac and a well-developed diffuse placenta nurture the unborn babies. After birth, the babies shed their skin and eat it along with the remains of the yolk sac, membranes and placenta. These are rich in nutrients and being their own DNA, are easily digested. The young are able to live independently from birth but often accompany their mother for 1-2 years before dispersing. Females are able to breed at 3 years and usually have 1 offspring until their bodies are larger. The ability to store fat determines fertility so in lean years they do not breed. Bobtails grow rapidly in their first year but continue to grow slowly for many years. A bobtail may live up to 70 years but changes in the environment reduce the lifespan.

Habitat

Bobtails prefer low scrub with plenty of open areas for basking. Their markings help to camouflage them while they sit in the shadows or under bushes. On sunny days, bobtails will position themselves to absorb heat and seek shelter in burrows or piles of leaf litter to avoid cold or overheating. Solitary for most of the year their home range is about a square kilometer, depending on food and shelter. They have adapted to a variety of habitats even suburban gardens where they often fall victim to dog attacks and garden tool accidents. Road accidents are increasing as more land is cleared and developed.

Handling

A bobtail's main defense is its vice-like jaw, which can inflict a powerful bite. The large bulges on the head are jaw muscles.

Grasp the bobtail at the back of the neck to avoid being bitten, keeping the forelegs close to the body. Place your other hand under the body supporting the belly and back legs. Bobtails are terrestrial and become stressed if they cannot feel the "ground" beneath them. A firm but not tight grip will keep you in control without restricting the animal's breathing. Animals with spinal injuries need to be carried on a flat surface such as the cage floor of a hot box.

Use gloves or clean hands when handling a bobtail that is sloughing, as the skin is very absorbent during this process.

OH&S: Always wash your hands after handling reptiles as they can carry harmful bacteria on their skin



Housing

The best housing provides:

- The PBT in a heat gradient
- UV daylight lamp (UV rays do not penetrate glass) timed to give normal photoperiods
- Non-abrasive surfaces that are smooth and easy to clean
- A large shallow water dish for drinking and to provide adequate humidity
- A basking log positioned a safe distance from the heat lamp and close to the UV light source
- A hide for emotional security
- Fly-proof ventilation
- Rough rocks to remove skin when soughing

A vivarium is designed to provide a reptile's needs but a printer box is adequate as long as the above conditions are provided

As most vivariums are designed for air-conditioned buildings, care must be taken to prevent overheating on very hot days if climate control is not available. Cool packs (chilled but not frozen) can be placed in the vivarium to provide a cool-down area. These can be washed and placed back in the fridge overnight for use the next day.

Assessment

Unless life-threatening injuries require immediate attention eg bleeding or maggots, slowly warm the bobtail to its PBT (about 1 hour) before assessment.

Common Problems

Trauma

Predation
Car Accident
Garden Accident
Burns

Illness (Infectious)

Flu
Parasites
Infection

Birthing

Dystocia (difficult birth)
Caesarian
Newborn care

Initial Examination

Assess:

- activity level - inactive/sluggish movements/active (at PBT)
- body condition - emaciated/thin/normal/pregnant/wounds/asymmetry
- eyes – discharge/sunken/clear/damaged
- mouth mucous membranes – pale/pink/mucous/injury
- nose- blocked/sneezing/discharge
- skin – wounds/ticks/sloughing
- mobility – walking/not walking
- attitude – menace response/defensive tail curl/not responsive
- Infectious (Flu): sneezing/ bubbles from eyes and nose

Treat trauma cases first, then attend to infectious cases in an Isolation area.



Trauma/ Predation

These injuries are usually in the warmer months when bobtails are active. Dog attacks are more common in spring when bobtails seek out their mate. Due to bobtail's thin, cylindrical body, even small dogs can puncture internal organs which life threatening. Complications occur with:

- maggots entering body cavity wounds
- dehydration and/or hyperthermia
- eviscerated or prolapsed organs
- inappropriate home care by untrained rescuers.

While in phone contact with the rescuer- ask them to transport the bobtail in a fly-proof box and keep to it out of direct sunlight.

Treatment

- Weigh the animal
- Give warm, oral fluids twice daily (BID)- Water or 0.9% Saline for all bobtails on admission (do not use Spark or Hartman's). See Chart 1.0
- Bobtails with head and mouth injuries will need Intracoelomic (ICe) fluids – given by a veterinarian/trained equivalent

NOTE: Do not give ICe fluids to a bobtail that is obviously pregnant

- Give pain relief(**Ketofen**® 2mg/Kg I/M, SID) once hydrated
- Flush external wounds with warm saline to remove debris and any maggots. *Do not flush into the hollow body cavity*
- Bathe the wound in a warm Betadine 1:10 solution in water
- Give antibiotics as directed by your vet eg **Baytril**® (5mg/kg SID) sub-cutaneous (SC) in the upper body or orally (PO) daily, for a minimum of 10 days, longer for infected wounds. Dilute Baytril with STERILE WATER FOR INJECTION to prevent necrosis at injection site
- Dress the wound with a primary dressing eg Solosite, Iodosorb or Silvazine

NOTE: A bobtail's body is a thin cylindrical shell with very little flesh. Puncture wounds can involve damaged internal organs and care must be taken to keep topical creams out of the body cavity

- Cover open wounds with a secondary dressing eg **Thin Duoderm** or **Opsite** and cover with **Fixomull** or **Vet Wrap** dressing and change every 3-4 days, daily if maggots were present.
- Cover minor wounds with **Fixomull** and apply **Silvazine** or **Iodosorb** daily through the dressing pores. Change in 5-7 days.

Bobtails with fractures and wounds needing dead tissue to be debrided under anaesthesia, will need to go to the vet.

Bobtail Fluid Therapy

Bobtails need 1-2% of their body weight in water daily for maintenance, 5% if dehydrated. Most rescued lizards are dehydrated.

BWt (g)	2% rehydration	5% rehydration
50	0.5ml BID	1.3ml BID
100	1.0 ml BID	2.5 ml BID
150	1.5ml BID	3.7 ml BID
200	2.0 ml BID	5.0 ml BID
250	2.5 ml BID	6.3 ml BID
300	3.0 ml BID	7.5 ml BID
350	3.5 ml BID	8.7 ml BID
400	4.0 ml BID	10.0 ml BID
450	4.5 ml BID	11.3 ml BID
500	5.0 ml BID	8.3 ml TID
550	5.5 ml BID	9.2 ml TID
600	6.0 ml BID	10.0 ml TID

BID = twice daily
TID = three times daily

Chart 1.0

Pregnant bobtails may weigh more than 600g but their stomach capacity is unchanged so tube feed no more than 10 - 12mls 2 - 3 times a day.

Bobtail Flu

Signs of the Bobtail Flu

May include all or some of the following:

- Emaciated, with a thin, flat tail
- Bones prominent at pelvis and along spine
- Lethargic and non responsive
- Sticky clear ocular and nasal discharge, sometimes bubbly, eyes often glued shut
- Sneezing **a lot** (healthy bobtails will **occasionally** sneeze to clear salt deposits formed in the back of the throat)
- Pale pink to white mucous membranes in throat (tongue is normally blue) after warming up
- Thick, tenacious mucous in throat
- Younger bobtails may show lower respiratory disease, bloated torso, gasping for breath

Treatment

- Treat trauma cases in the hospital first, then attend to infectious cases.
- Use barrier nursing - wash hands after handling each animal, treat healthiest animals first and don't backtrack
- Place infected bobtail into the centre of a warm vivarium set to 30°C.
- Leave to heat up for 1 hour before assessing and treating
- Re-hydrate orally with warmed Normal Saline (2-5ml/100gm of body weight) spread over the first day
- Nebulise x 1 daily (see below)
- Inject **Baytril 50** Intra-Muscular (I/M) in the upper body area at 5mg/Kg body weight, every 24 hours until gut function returns through feeding and passing stools. NB: Baytril can cause irritation in reptiles so dilute with Sterile Water for injection
- Change to **Baytril 25** Per Oral (P.O.) at 5mg/Kg body weight, SID until a total of 14 treatments (I/M + P.O.) has been given
- Cease Baytril but continue to nebulise daily for 1 week
- Cease Nebuliser and observe for signs of relapse for 1 week

Newborn Bobtails

Bobtails have well developed placentas but the disease doesn't appear to cross into the foetus. Newborns are separated from their sick mothers to prevent cross infection.

Nebuliser

Using an Allersearch Rapid nebuliser, micro-particles (2.5 micrometers) of distilled water are delivered into a nebuliser chamber for about 15 minutes.

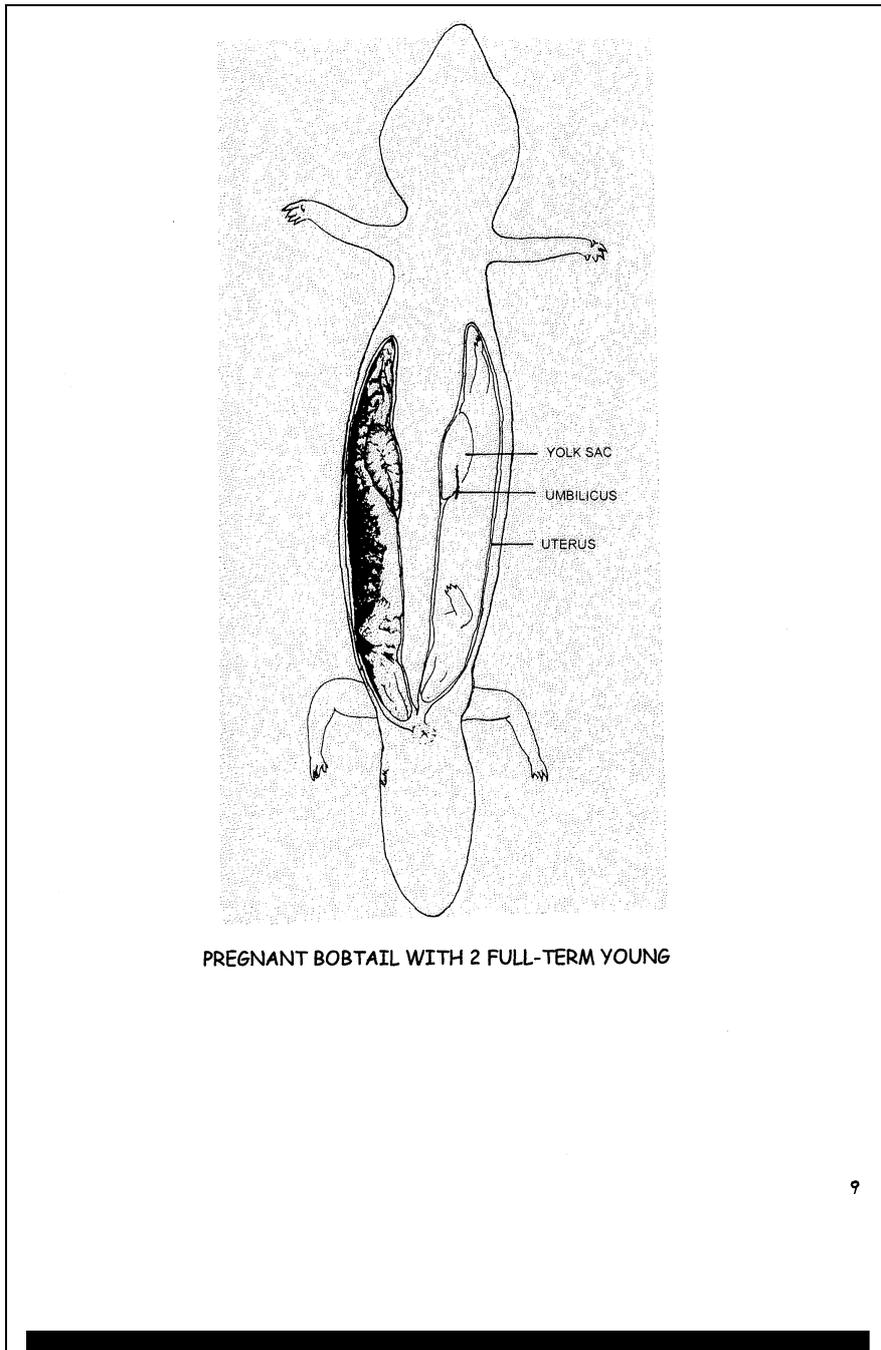
After removing bobtail, spray inside of chamber with *F10* disinfectant and wipe dry. Bobtails are more alert and have increased appetite after nebulising so this is a good time to assist feed (see below).



Daily Supportive Care

- Record weight
 - Bathe eyes with warm water to remove sticky exudate
 - Apply ophthalmic ointment when prescribed
 - Wipe mucous from inside mouth/throat with a cotton bud
 - Remove any ticks
 - Clean and dress any wounds
 - Take to vet for major wounds/ fractures
 - Check faeces for internal parasites and treat accordingly
 - House in vivarium, providing a heat gradient with a basking lamp at Preferred Body Temperature (PBT) 30 °C. monitor temperature of each vivarium
 - Provide normal photoperiods using UV daylight tubes, which are regulated with a timer or solar cell, to turn off at night and on in the morning.
 - Tube feed Reptile Supplement in Normal Saline (2ml/100g body weight) if debilitated.
 - When passing faeces cease tube feeding and assist feed daily until self-feeding enough to gain/maintain weight (see *sick bobtail diet* below).
 - Move to Pre-release vivarium if available, when medical treatment and observation period cease
 - Change to *healthy bobtail diet* (see below) until pelvic bones and spine are well covered and tail is plump.
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Live Birth



Gestation is +/- 150 days.

Birth only takes a few minutes after several weeks of exaggerated breathing and contractions.

The young are large; a third to a half of their mother's body length. This makes breathing difficult for the mother, as bobtails have no diaphragm to separate the lungs from the developing babies. Breathing is further complicated by respiratory disease.

Newborn take about 30 minutes to ingest their placenta and membranes.

Newborn Bobtail Data						
Admission Number	Age (days)	SVL mm	Tail Length	Total Length	Weight (g)	Litter Size
1932	0				101	Triplet
1931	0				93	Triplet
2102	0	147	39			Single
2077	12	143	37	180	61	single
1960	53	230	66	296	242	single
3579	1			188	73	Twin
3580	1			196.5	96	Twin
6410 A	0			184	67*	Triplet
6410 B	0			184	62*	Triplet
6410 C	0			182	56*	Triplet
6494	3	151	55	205	80	Triplet
6495	3	152	45	197	86	Triplet
6498	3	149	42	192	70	Triplet
6491	3	120	31	151		Midget?
6544	0	116	25	141	31	Died

*Stillborn- did not ingest afterbirth

Dystocia

Sick, pregnant bobtails are often too weak to give birth and may die before the young are delivered. A Veterinarian can save the unborn by performing a caesarian operation. As reptiles are able to survive for long periods of oxygen deprivation, voluntary breathing can be delayed by up to 30 minutes. Seemingly lifeless young can be revived by

- clearing the airway
- clamping the umbilical cord
- placing the baby bobtail in warm (25 -30°C) water bath up to its neck.

Once conscious, the newborn can be fed the afterbirth and placed in a separate vivarium so it won't contract its mother's illness.

Diet

Baby, juvenile, sick or injured bobtails need feeding daily. Sick bobtails are tube fed or assist fed when they are hydrated. Bobtails are maintained at their preferred body temperature 28 - 33°C while food is being digested. This may take several days.

The diet should comprise

- 22% hard apple for healthy bobtails, soft juicy watermelon for sick URTI bobtails
- 22% banana
- 22% tomato
- 22% washed greens– silver beet, dandelions, broccoli
- 12% Wambaroo Reptile Supplement Mix ® (RS)

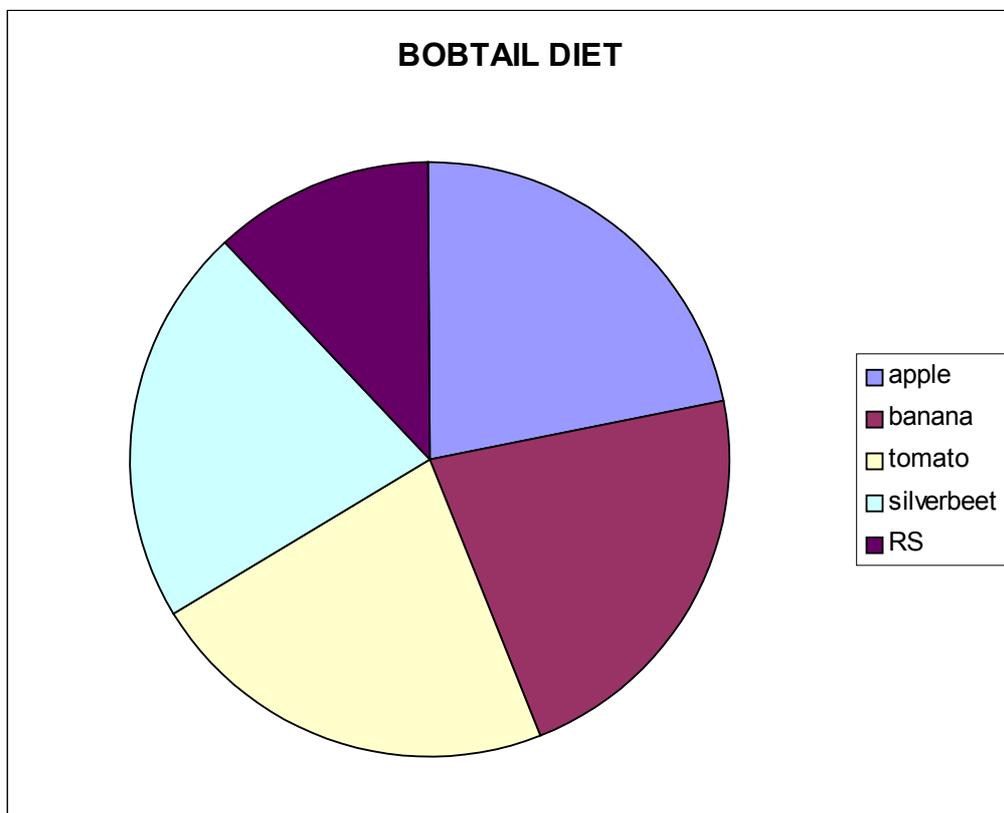


Chart 2.0

Tube feeding

Fruit puree with Wambaroo Reptile Supplement® (RSM) mix can be tube fed to sick, hydrated bobtails via a feeding tube. Adults can take 8 – 10 ml and juveniles 5ml. Baby food with vegetables and meat Pass the tube over the tongue taking care not to enter the slit in the hard pallet in the roof of the mouth. The airway is small and easy to avoid but keep the animal straight so that the tube does not rupture the oesophagus if the animal decides to start curling its body into a defensive posture. Keep the head elevated to prevent food flooding back up the throat into the airway.

Note: Grind RSM in a coffee grinder to prevent blocked tubes and syringes

Assist feeding

Chop the food into bite sized pieces appropriate for the size of their throat. Carefully open the mouth and place a piece of chopped food on the tongue with *metal* forceps. The jaw may clamp shut so take care not to damage the gum tissue by dragging the forceps out; wait for the mouth to open then withdraw. Raw egg yolk can be spoon-fed but take care to clean any spilt food from the face afterwards. Feed only a few pieces of soft food at first to allow the gut to become active again.

Food Estimates

Bobtail weight	Food weight
100g	33g
200g	60g
300g	81g
400g	102g
500g	121g
600g	142g
700g	160g

Example:

A 100g Bobtail needs approximately 33g of food a day.

7g each of apple/watermelon,

7g banana,

7g tomato, 7g greens and

5g Wambaroo Reptile Supplement Mix

Once healthy and in good body condition, feed only 2 – 3 times a week to prevent obesity.

Natural food such as snails, yellow native flowers and insects can be introduced as enrichment and preparation for release.

Pre-release Assessment

- The bobtails must be healthy, self-feeding, alert and exhibit a menace response to people and have good body condition.
- Feed firm fruits and vegetables eg. Sweet potato, apple, pear, green beans, grated carrot to the above diet to toughen gums and palate of Pre-release or long-term cases that are self-feeding.

Release

Bobtails mate for life so are usually returned to their home range as long as there are no present dangers due to dogs, traffic or toxins. Otherwise, release within the same postcode to where the animal was rescued to maintain genetic identity.

Plan to release when the weather forecast is favourable for the next few days. Choose a time during the day when sunny and warm to allow the bobtail to move towards shelter. Hand-reared juveniles should be over 250g body weight for a greater chance of survival.



NOTE: During the colder months, when overnight temperatures drop below 10C , fast pre-release bobtails (keep heat on) for several days, monitor stools and turn heat off after gut is empty (3 days of no stools) release in the warmest time of day.

Conclusion

Good husbandry and treatment regimes, tailored to the individual species, can yield good results in rehabilitating bobtails back to the wild and thereby reversing so much negative human impact on these incredible animals.

WEBSITES

Vivarium suppliers:

www.ultimatereptiles.com.au

www.reptapets.com.au

Wound Management

www.anapsid.org/emergency/firstaid

www.worldwidewounds.org

BIOGRAPHY:

Ruth is a Registered Veterinary Nurse. Her career spans 4 decades in Melbourne and California. She worked as a laboratory technician at Veterinary Research Institute, Melbourne for 6 years, in haematology, clinical pathology, post mortem room and research projects. Ruth began working with wildlife 1985 when she encountered an orphaned pinkie possum and joined the Wildlife Branch of RSPCA Victoria. She moved to Perth and began volunteering at Kanyana in 1992. Ruth is involved in training volunteers, vet students and vet nurse students on care and medical treatment for wildlife. She set up an isolation ward for sick bobtails in 2004 and spoke on Bobtail Flu at the NWCC in Penrith NSW in 2004

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