

## MARSUPIALS / MACROPODS

### Marsupial

The word “Marsupial” refers to a group of about 260 different species of animals that share the common feature of bearing their young at (basically) a premature stage in their development and raise their infant to a juvenile stage in an anatomical pouch.

**Marsupials** found in North America are Opossums and are called Kidelphids. South America is also home to a variety called Caenolestids or Rat Opossums. The others, found only in the Southern Hemisphere, mostly in Australia, Tasmania and New Guinea are: the Macropods (kangaroos and wallabies), Phalangiers which are called Possums (not the America’s Opossums), Dasyurids which are insect eaters, Peramelids or Bandicoots, Koalas and Wombats. Other than Kangaroos, well known names are : Koala (*Phascolarctos cinereus*), the Sugar Glider (*Petaurus breviceps*) and here in North America the Virginia Opossum (*Didelphis virginiana*). There are a wide array of differences and some similarities between various subgroups of Marsupials. The key determinative factor in classifying them as Marsupial is the use of a pouch in which to rear their young.

There are so many known Marsupial varieties, it is vital to recognize that each requires its own specific environment which ideally would closely resemble the basic conditions provided them in their native geographical region. It goes without saying that some animals can not responsibly or reasonably be housed by the average “individual” in every private situation. The desire or ability to acquire any animal, (Marsupial or any other for that matter) is the taking of a great responsibility, to say the least. Each individual should consider their intent and ability to provide their pets with not just an acceptable environment, but one that provides superior care and consideration for the well being of the pet. One should do all the research they can about appropriate care and each animal’s individual requirements. Consider the cost of acquisition, housing, veterinary care (including the availability thereof), feeding and spend a moment thinking of the emotional requirements of the pet you are considering adopting. Can you provide them with a home that YOU would enjoy if you were in their paws? What are the laws governing ownership of exotic animals where you live? What are the costs of ownership worse case scenario? Double that amount, can you still afford it? Where will you be finding a knowledgeable Veterinarian?

To describe in detail, the appropriate care of each of the individual species of Marsupial would read like an encyclopedia. We are going to discuss most specifically the best case care as we see it, for the largest subgroup of Marsupial and the most common privately housed Marsupial, the Macropods. I know that lots of people are going to say “WHAT ABOUT.....?” Our expertise (such that it is) is in Macropods, so we can expound with conviction and experience. If you are a Koala Farm in Kalamazoo or a Sugar Glider Haven in Syracuse (We are a Wallaby Ranch in Washington!!) and you would be so kind as to Author a fact sheet and contribute it to our cause, we will be most delighted to consider it for inclusion herein.

### MACROPODS

**Macropods** are marsupials and they belong to a family called Macropodidae. Included in this family are subfamilies the likes of: Kangaroos, Tree Kangaroos, Wallabies, Padamelons, Quokkas, Bettongs and Pottoroos.

The meaning of the word Macropod is a Greek derivation of “Large Foot.” So basically, Macropod means Bigfoot. To simplify the description process, one might say that Macropods are all Kangaroos of one size or another, ranging from the tiny Kangaroo Rats or the tiny 2 pound Pottoroo to the giant Red Kangaroos who can tip the scales at near 200 pounds and stand over 7 feet tall on their toes. Over 50 individual varieties exist in the Macropodidae family, so it is again difficult to provide specifics on the care of each individual variety. We will attempt to provide some simple descriptions of the less popularly kept Macropods and follow with specific

details on the rearing and housing of perhaps the most popularly kept Macropod, the Red Neck or Bennetts Wallabies.



*A small mob of grazing Bennetts Wallabies*

**Macropods** are grazers and browsers so they would be considered essentially Herbivorous. Their diets consist of grasses, roots, leaves and branches found in their native habitats. Their teeth are designed with a straight row of cutting teeth like ours in front with a space in front of the molar teeth and no canine teeth at all. Most Macropod species have four molars and while some experience eating difficulties when those wear, others have a tooth replacement process called molar progression in which the molars are progressively lost and replaced with new teeth.

The digestive process of Macropods is a bacterial break down system much like horses or cattle (ruminants) have, to digest the high percentage of roughage in their diets. Larger Macropods like the Red and Grey Kangaroos and the Common Wallaroos are known for their ability to travel long distances on little water and a very low quality diet. Interestingly, it is the digestive system of the Macropod that provides the seed for what may be the greatest challenge to keeping many Macropod species in captivity. When subjected to unusual stress, a Macropod's immune system may be compromised and the bacteria, necessary for the digestive process can begin to grow out of control. This overburden of (basically) parasites can quickly grow and the result is often the demise of the animal due to the anemic condition caused by depletion of red blood cells and their replacement (in effect) by parasites. Low stress environments are a key to the keeping of Macropods.



*“Velvet” A young Albino Bennetts female shows off her “Big Feet”*

The “Large Foot” and long tail are common elements in Macropods as are the relatively small heads, large ears and on the females, forward opening pouches. The feet are normally very long and narrow and commonly have four toes. Central is the largest and strongest toe, functioning greatly during high speed maneuvering or in self defense. On the outside of each large toe is a smaller toe and on the inside are the two smallest toes. The small toes are normally fused together and function as a thumb for grooming and care of the ears.



*“Rocky” the Red Kangaroo shows off his hands*

The smaller front paws or “hands” have five, finger like digits, on smaller arm like limbs.

**Pademelons, Quokkas, Bettongs and Potoroos** are some of the smaller and lesser kept of the Macropods (listed with the smallest last. Potoroos are tiny little guys weighing only 2 to 4 pounds. These small Macropods can be kept in lesser spaces than the larger Kangaroos, and while quite a few are actually kept in captivity, many are simply impossible to get or keep privately. Perhaps practicality and economics play a role to some extent given the small size. Housing of smaller animals in captivity is often difficult due to the requirement for fully enclosed housing of some nature. Enclosing a large area well enough to protect large numbers of small animals., from predators is often not practical or economical for the average private interests.

**Tree Kangaroos** of nearly a dozen varieties exist, for example, but are very rarely held in captivity and require large enclosures with plenty of high trees for natural activities, when they are. A few Tree Kangaroos are housed in the larger Commercial Zoos in the world. Here again, the difficulty (aside from any regulatory considerations) of safely and adequately providing for this type of splendid animal makes private ownership rarely practical.

**Wallabies, Wallaroos and Kangaroos** make up a sizable subgroup of the huge and varied category of Marsupials. Nearly fifty more animals from the tiny, 4 to 5 lb New Guinea Dorcopsis or Forest Wallabies, to the nearly 200 lb giant Red Kangaroos, fill this category. In general, size is the recognized determinant of sub category here. Those species with an average weight of 44 lbs or less are considered Wallabies. Those species growing on average to 45 lbs or more are considered Kangaroos.



*“Mickey” a young Red Wallaroo will grow to 100 lbs.*

A completely separate species, “Wallaroos,” a species conveniently named as though they were a mix of

Wallaby and Kangaroos (they are not), are also conveniently sized in between, growing as large as 70 to 100 lbs and standing up to 5 feet tall on their toes. Common Wallaroos of which there are many, including some known as “Rock Kangaroos,” by virtue of size find themselves included in the category of Kangaroos. Wallabies and Kangaroos will congregate in a group called a “Mob” for grazing and relaxing for the apparent purpose of safety in numbers. When a wary roo senses danger, it will run off while thumping the ground in a noticeably loud and alerting way. This signal sends a message of high alert to all members of the mob and they often respond by fleeing in mass. Youngster “Roo” are called “Joeys” while an adult female is known as a “Sheila” and the adult male referred to as a “Boomer.” One dominant male generally does the job of fathering all of the mob’s Joeys. Like many species, the male requires nearly twice as long as the female to reach the age of sexual maturity. It is assumed that these characteristics are built in to assure that the females are all quite pregnant by the time the young males reach maturity. Young males must challenge the right of the dominant male when approaching the females, so they are either ready to drive off the big cheese, or they are themselves driven off by the stronger and larger male.



*Healthy examples of the Grey and Albino Bennetts Wallabies*

Perhaps the best known and most popularly kept animal in this large Macropod category, is the Bennetts Wallaby, native to Tasmania but also found on mainland Australia (known there as the Red Necked Wallaby). These mottled grey and white animals grow to 35 to 60 lbs and stand 2 to 3 feet tall. They are a species that tends to be very hearty in even fairly cold climates as their native foothill habitat in Tasmania is cold and snowy in the winter. Both Grey and Albino varieties of the Bennetts Wallabies are found in private hands worldwide. Their average life span in the wild is approximately ten to fifteen years. Bennetts have however, been known to survive as long as nineteen years in a quality captive environment. A giant Red Kangaroo apparently holds the record for life span in captivity, surviving 28 years with high quality care. This illustrates the substantial commitment one makes to provide surrogate care when the exotic of choice is the Kangaroo.



*“Velvet” again shows a good view of a Macropods legs*

The hind legs of the larger: Kangaroos, Wallaroos and Wallabies are an energy efficient design using a long,

leveraged foot connected to a spring like tendon and pivoting on an equally long and effective upper leg. The foot connects to the leg with a long section of the foot in front and a short section behind the joint. The ankle or back of foot is then connected to the thick tendon that runs up the back leg. When still, the tendon is relaxed and when hopping the tendon is under variable tension. When the tendon is tightened the foot extends the animal hops. On landing the tendon is stretched, like stretching a spring and the next hop is assisted by the resultant spring like tension, returning the foot to its extended position. The tightening of the tendon is effortless for these larger Macropods so long distance travel at moderate hopping speeds requires very little expended energy. These efficient hind legs unfortunately lack independent mobility. Consequently, slow movement which we would equate to walking is done by moving the still (and retracted) hind legs, while lifting them off the ground by using the front legs and tail as a “tripod.” In other words, the forepaws and tail take the animal’s weight as the feet are brought forward. The extremely muscular tail that aids this slow walking motion is held straight out as a balance beam when hopping at high speeds.

A connection exists between the hopping of these greater Macropods and their breathing action when traveling at speeds. The lungs are compressed internally when the animal hops and he thus exhales. Throwing the feet forward for landing contrarily pulls the lungs open, filling them with air. Hopping repeatedly thereby takes the conscious breathing action out of the picture and for all practical purposes, breathes for the fast moving animal. It has been effectively demonstrated that hopping rapidly takes virtually no more energy than hopping slowly so increased speed does not burn exponentially increasing amounts of energy in Macropods as it would in human beings, or horses for that matter. It has also been determined that weight has as little effect on energy requirements as speed, so a growing baby in a female’s pouch adds little strain and Mum is nearly as capable of flight and maneuvering as she would be without her little package.

### **BREEDING CYCLE OF THE AVERAGE MACROPOD**

**Bennetts Wallabies** are among the most widely held Macropod, owing to their heartiness and virtues of adaptability. The larger Macropods seem to be less vulnerable to difficulties associated with stress and thus the most commonly found in private ownership. We have exploited the trusting nature of a beautiful Bennetts female named Victoria Secret to provide you with many of the following photographs, illustrating the most incredible infant bearing process we know of. Many Macropods and selected other Marsupials share some of the surprising capabilities we discuss here.



*“Vanessa” sits on her tail in the birthing fashion*

Following a short gestation period as is common in marsupials, 28 to 35 days in the case of the Bennetts Wallaby, the partially developed embryo is delivered in a simple conventional birthing exercise while the female sits with her tail outstretched in front of her, licking a path to the pouch. The licking of a path to the pouch is the only assistance given by the female to her newborn infant, known as a Joey. There seems to be some confusion over exactly what assistance the action of licking the path provides the newborn and partially developed Joey. The direction of travel is clearly defined by gravity, since the female gives birth in a sitting

position. This always leaves the pouch straight up and the embryonic Joey uses its (nearly fully developed) tiny arms and hands to claw their way up to the opening of the pouch. The forearms and front paws are the only well developed part of these newborns and they use them instinctively, to laboriously pull themselves along the wet path provided by Mum. The debate stems from a difference of opinion as to whether the female licks the path to help the infant stick to her without falling off, or if she licks the path to lubricate the area so the infant does NOT stick to her and find itself unable to move.



*Birthday Baby Bennetts Wallaby*

When the strong survive and baby reaches the pouch, it locates one of four nipples located in Mum's pouch and attaches itself. The nipple quickly begins to swell and effectively locks baby on, where it will stay for many months. The photo above is the day of birth as evidenced by the short length of the nipple baby locked on in mid air. The nipple will immediately begin to elongate to facilitate movement by the fast developing infant. At this early stage, the infant Joey has no instinct or reflex designed to suck formula from Mum. The adult female possesses a special abdominal muscle which she uses to pump the appropriate amount of formula to baby. Within a few days, development is well underway with baby's eyes, ears and limbs beginning to take shape and darken (no pigment is noted in the Albino).



*Ten day old Bennetts Wallaby "Gabrielle"*

Within ten days, many things have taken place. The nipple baby hangs on, has lengthened and baby now lays on its back in Mum's pouch. Eyes, ears, tail, hind legs and claws are all clearly developing. By a week to ten days after the birth of the suckling infant Joey, the female will breed again. Another egg is fertilized by the male and begins to develop within the female. At the point that the developing embryo, now called a

“Blastocyst,” reaches approximately one hundred cells, its development is slowed to a stop and it enters a state of suspended animation called “Embryonic Diapause.” Under normal conditions of abundance in food, water and general health, the blastocyst will remain in diapause until a decrease in lactation for the female triggers the process of development to start again. Then within 28 to 35 days, the newly developed infant is born and the cycle begins again.

Shockingly, it has been recorded that births have taken place following a period of up to two years of embryonic diapause when unfavorable conditions for Joey rearing persisted in the interim. Drought or excessive mob numbers for the available food are reasons that a period of embryonic diapause might be extended. If things do not go well with the development of the infant in mum’s pouch and it is lost, Mum of course has the baby in diapause ready to go to expedite the process of replacing the lost Joey.



*Albino Wallaby “Sundance” and Grey “Gabrielle” with eyes open and looking back at 5 months*

When all goes well, after about five months of development and constant attention from its Mum, the infant Joey has developed to the point where the eyes will open. It is at this time that baby also begins to release Mum’s nipple, then reattach on its own to continue feeding. The photos above show the surprising difference in appearance between a pigment lacking albino infant and a darkening grey at the same stage of development.



*“Gabrielle” seen here still in her birthday suit*

Within a couple weeks, baby is seen peeking out of Mum’s pouch and popping back in whenever one of life’s endless new surprises gives baby a start. Over the next several weeks, baby learns life’s little secrets from the ever vigilant female. Baby is taught what to eat by virtue of simply following Mum’s lead. It is also at this time that baby begins to develop the bacteria in the gut needed to take over the process of breaking down the newly introduced solid food. One of the first things baby ingests is dirt, thereby introducing bacteria into its system where only sterile formula had previously been. This first bacteria which accompanies the dirt, will

support the process of digestive decomposition in the Joey's stomach.

Over the next few weeks the bacteria grows to healthy working digestive quantities and along with the introduction of new solid food to babies system, forms the base for the beginning of the production of solid waste by the growing Joey. Mum simply removes solid waste from the pouch in her normal cleaning exercise. While critical internal changes are taking place at this time, external maturation is noticeable by the ever thickening fur growing on baby's skin. Over the next few weeks, light peach fuzz gives way to a full coat of soft fur and Baby Joey begins to gain the ability to withstand the elements as its little body learns to regulate temperature on its own (thermoregulation).



*"Gabbie" is venturing out completely around six months*

Once fully furred, at six to six and a half months of age, the young Joey begins to venture out of the pouch. Some have comically appeared to simply fall out on their little bean when stretching too far for food. They will return to Mum's pouch by grabbing at it with their little hands, poking their little head in and a somersault later, the tip of their tail is last to disappear. Soon, Joey is spending more time out of the pouch and exploring further from the security of Mum's heartbeat. Mum will begin to allow and eventually encourage baby to spend more time out of pouch and on its own. Other changes have been taking place without notice within the female. The formula Mum has been feeding baby has changed from an infant formula, to a juvenile formula with all the added fats and nutrients necessary and now able to be assimilated by Joey's more advanced digestive system.



*"Gabrielle" getting a snack at eight months*

By the time the Joey reaches 10 to 11 months of age, Mum closes the pouch to youngster's entry, but continues

to allow access to the growing Joey's own personal nipple from outside the pouch. It is this vital series of advancements in Joey's development that assure the lactation changes for Mum that mark the start of the gestation period for the blastocyst she holds in embryonic diapause. Before long, the new infant is born and makes its own journey to the pouch.



*New Baby takes the adjacent nipple with larger nipple on right*

New arrivals to Mum's pouch will attach to a different nipple than the larger nipple that the juvenile, now feeding from outside (referred to as "at heel"), has been using. If it is available, the new infant will take the nipple immediately adjacent to the one being used by the Joey at heel. It is obvious that while the Joey at heel accesses its customary supply of formula, it takes care not to disturb the developing infant on the "nipple next door."

Thus continues the normal birthing cycle as experienced more or less and give or take some details, by most Macropod females. Nearly all Macropods give birth to only one Joey at a time and rarely does a Macropod female, adopt another female's baby. If very young, lost Joey's are lucky to survive the elements or the danger of being stomped on by adults other than their own protective Mum. Most female Macropods simply do not have time to deal with any other female's babies. The average female you see accompanied by a Joey at heel, is responsible for a total of four generations as she stands there. She is responsible for herself, the Joey at heel, the Joey in the pouch and the Joey in embryonic diapause. They are a breeding machine, but a methodical and thorough one, producing only a single baby in the typical year.

## **MAINTAINING MACROPODS AS PETS**

Many Macropods are commonly maintained as pets and in many cases, are simply family members. Like many other animal groups, the (physically) larger species of Macropods are the most widely held by private parties. Larger species are often comparatively hearty and often less prone to stress and perhaps less driven by purely instinctive flight responses. Additionally, the smaller animals require conditions difficult to provide in captivity with the highest consideration given to protection from predation. In the wild, Macropods of all sizes face dangers and predators ranging from the bite of a small poison spider to the crafty and prolific predator, man. Dangers in captivity include even more potent combinations. Everything from bacteria on the ground to the eagles and hawks in the skies above can be detrimental to the survival of captive animals. The result is that the smallest Macropods are commonly caged in tiny enclosures that provide a safe, but less than ideal home. It also appears to be less often that the smaller animals are likely to become tame as pets go.



*“Rocky” a juvenile Red Kangaroo gets a bottle from Mommy and a hug from Daddy*

As a breeder, we consider a pet quality Macropod to be one that enjoys the interaction that they have with human beings. This narrows the variety of Macropods we discuss here to the larger Wallabies and Kangaroos as well because they can easily be handled and maintained as a companion and a friend. Ours is experience with Bennetts Wallabies, Wallaroos and Kangaroos which can all be incredibly enamoring as personal pets and as friends. We recommend hand rearing any pet Marsupial if the intention is to maintain it as a pet. Hand rearing is a tremendous investment in time and effort but pays off in the most important aspect of any relationship.....TRUST. If you are not willing to make this investment in the interest of trust, we recommend you select another species for a pet.



*A beautiful pair of Albino Bennetts Wallabies and the a trio of Grey Bennetts at dinner time*

**Bennetts Wallabies** are the species of choice for most people who desire to raise a pet wallaby. The Bennetts is native to Tasmania where the seasons are very much like the seasonal variations found in much of America. They are a medium size and known for being hearty and adaptable. Bennetts are widely held in both the common Grey variety and the more exotic Albino coloring. The Bennetts Wallaby or Red Necked Wallaby (as it is known where found on mainland Australia) can be maintained in an indoor/outdoor environment anywhere as long as there is ample room to exercise and obtain the nutrients provided by natural exposure to sunlight etc. It is commonly recommended that an area of at least 2500 square feet of outside enclosure be provided for a pair of Bennetts Wallabies. This is an area where more is better to some extent. It would not be necessarily perfect to provide ten acres of Wallaby pen. Unless you had a whole lot of Wallabies and/or intended them to

simply go off and live in the wild of your own property. But a half acre of pen would not hurt anything, even for just a couple. Bennetts Wallabies are very even in temperament and when “bottle raised,” will bond with its surrogate Mom and family very quickly and inseparably. Their soft and loving nature and total dependence on their surrogate Mom endear them to those who take on the responsibility of parenting such a demanding and rewarding friend.

Parenting an infant Joey is a huge responsibility and bottle feeding any baby, is the most demanding of investments. But if you wish to have an exceedingly tame and loving pet, that is the way to do it. Your Baby will grow up to be a strong and independent natured animal but will trust you and enjoy contact with you. Once an adult, Wallabies require little actual care, aside from maintaining their housing and removing wastes. They do not tend to try to escape from their homes or yards, where they love to romp and play. Most fencing is provided for THEIR safety and frankly to keep others out. Wallabies are groomers, and they have virtually no natural odor, so they are very conscious about their appearance and easy to tolerate inside or outside. They are just dolls when they stand up, lean back and scratch their bellies, or when they hold a treat in their hands and enjoy it. Not to mention when they hold you with their little hands and beg for love. The single strange and sometimes surprising thing they do is a process called “Merycism.” Merycism is the process of regurgitating and again swallowing some of their food. Some do this more than others, but most of them do it occasionally. It is very much like the process of cud chewing in cattle. People often think the animal is choking or just getting sick when they first see it taking place. No worries, it is a natural though not so polite thing to do!



*Baby boy “Joey” with his new Mom*

**A Bennetts Wallaby Joey** is ready for delivery to a surrogate Mom when it is between 7.5 and 8 months of age, from the time of natural birth. Joey has by this time been taking short journeys out of Mum’s pouch and gained the strength to hop around as well as the sense to seek the security of the pouch as needed. The baby is gently taken from its natural Mum’s pouch, wrapped in a blanket and transferred to a man made pouch. Baby must be gently taught to accept feeding by its new Mom using a commercial Marsupial or Kangaroo formula.



*“Joey” receives a quality replacement Formula*

**Joey receives a bottle** containing regular amounts of warm formula every four hours at first (normally). A specially made artificial Marsupial nipple and a collapsible bottle are used to feed exact amounts of formula to Baby. At this point, Joey will weigh about 3.5 pounds and will spend nearly 24 hours a day quietly sleeping in a pouch provided by its surrogate Mom. Joey will be fully furred and so capable of some self-thermoregulation, but Baby must still be kept warm and secure in its own little pouch. We actually keep Baby in its small pouch and hang it around our neck so that Baby can ride on our belly just like with her natural Mum. In this way, Baby is kept warm, feels the breathing and heartbeat of its new Mom (as it is used too) and importantly, receives normal levels of stimulation just as it would in its natural Mum's pouch. Walking around all day long with Baby hanging around your neck in a pouch is exactly what your new Baby needs at first.



*Baby "JJ" learning to potty in the play-pen*

**Stimulating** is necessary for your Joey to learn when and where to go potty just as Baby had been stimulated by its natural Mum. For this purpose, we recommend using a simple baby play-pen with a "Pampers" type absorbent pad in the bottom. Joey will need to be provided with a few staples at this time in its play-pen too, including: Dirt, hay, food and water. The baby play-pen is a great place to keep these things to start. Baby will eat very little at first, but should quickly show interest in grass, dirt and hay. Slowly the intake of solid food will increase and Baby will become more regular at producing solid waste in firm pellet form. Liquid waste will be regularly produced immediately but Baby will need to be stimulated in order to go potty at the correct time. This process becomes a simple matter of feeding Baby a bottle, then pouring Baby out of the pouch into the play-pen. Baby can then be stimulated to go potty with a little tickle and spend a moment grazing on the grass and hay.



*"Apollo" comfortable in Daddy's arms*

Baby will scurry quickly back to its pouch at first, but will spend increasing periods of time, out of the pouch as development progresses. Many people recommend a heating pad be kept in the play-pen so that heat can be provided for Baby when the Joey is hung in its pouch, in the play-pen. We actually very rarely hang our Joeys

in a play-pen at all. We hang them around our neck, on our headboard or hold them in our arms. When Baby has gotten older and very active, we will hang the pouch so that Joey can go in and out, but I personally support as much physical contact as possible for as long as possible with a Baby Roo. I have often been heard to say that if you leave your infant Wallaby hanging in a play-pen all the time, you should not be surprised if it soon develops the personality of a play-pen. We do not let a play-pen raise our Babies. It seems that more stimulation and socialization for young Joeys leads to adults that are better adjusted, more trusting and generally more able to overlook the little things. This is good in an animal that can be detrimentally affected by stress.



*Juvenile Bennetts eating more solid foods*

**The weaning process** for a bottle raised Bennetts Wallaby is a simple matter of starting with six bottles per day and decreasing one bottle each month. Some youngsters begin to refuse to take the bottles at their own discretion and on their own time frame. Likewise, some will reject reentry to their pouch sooner than others. We allow the independence in that level of decision making. If a healthy youngster is eating solid food, drinking plenty of water (that is to say lapping water on their own) and dropping consistent, dark and firm pellets, their dependence on the formula is giving way to the digestion of solids. Under these circumstances, Baby is weaning itself. The development of “judgment” could be seen as the onset of the “Toddler” stage for a young wallaby. Like raising a child, raising your Wallaby is a matter of consistency and time invested, returning dividends. If you consistently feed and potty your young Bennetts Wallaby in a play-pen and on a pad made for that purpose (as an example), it should not surprise you if soon, your Joey is returning to the play pen to eat and pee on its own. Do not let it disappoint you if this process takes some time, it does usually work.

Wallabies and Kangaroos drop pellets as much more of an autonomous bodily function than the passing of water. Therefore, you will likely not be able to stop the dropping of pellets and must deal with that until such time as your Joey is ready to go outdoors. If you are as consistent with your efforts to condition a wallaby to use a play-pen to pee in, as you would normally be to housebreak a dog, this should be no real problem. If we have a Wallaby or Kangaroo in the house, we take it to pee every couple hours just the way we let the dog out.



*“Velvet” and “Vanessa” relax in favorite places*

**Juvenile Bennetts Wallabies** begin to show their independence and need for space by adopting their own places in the house and learning to run the obstacle course in between them. Sometimes at alarming rates of speed!! Bennetts Wallabies, like most Kangaroos, are actually “Diurnal” as opposed to “Nocturnal.” At the juvenile stage, Wallabies begin to exhibit behavior patterns that they will retain all their lives. Inside or outside, they will tend to get up in the wee hours of the morning to graze or browse for a few hours. This is the time that they usually can be seen running and playing. They seem to love the crisp morning air. Before lunch time, they will retire to their favorite spots to relax and snooze away the hottest part of the day. Late afternoon and early evening bring them back out to graze and they stay up doing so until late in the night.

Typically, by the time a Wallaby or Kangaroo is a teenager, they want to be spending a lot more time outside and we want them to be outside more too. They are getting bigger and needing to spend more time grazing and browsing than life in the house can provide, unless you switch the flooring all to grasses and weeds. That is not to suggest that Wallabies or Kangaroos commonly graze on your carpet. Quite the contrary, normally they will stick to grazing on your papers, photos or books and only disturb the carpet when they come across a stray thread sticking up. Maybe they think the lone stray threads are juicy weeds sticking out from the ground. Sometimes a doggie door is installed and a young Wallaby will learn to use it to go in and out. Ours simply go outside with the rest of the mob when they are ready. We spend time every single day with our mob and maintain a personal relationship with each individual one of our little Mobsters. They are the perfect cure for “Empty Nest Syndrome” or the onset thereof!



*Compact indoor housing with hay bales and heat lamps*

**Outdoor housing and Feeding** is a matter of providing fenced enclosures with cover that allows protection from temperature extremes and mostly natural vegetation for sustenance. A source of supplemental heat will be required for those animals susceptible to cold, in geographical areas experiencing harsh winters. We provide small buildings with large openings in each of our enclosures. Each building houses areas for food and water, as well as bedding areas with hay. In the winter, each building is supplied with hanging infra-red heat lamps for those animals who wish to take advantage. Bennetts Wallabies spend little time basking in supplemental heat, but the Red Kangaroos and Wallaroos seem to enjoy a bit more warmth in the winter. Bennetts Wallabies actually seem to love the rain and very rarely seek shelter even in a torrential downpour. They appear to tolerate snow quite well and actually show little sensitivity to temperature down into the low twenty degree range. We do not attempt to provide fully heated housing. We consider it unhealthy to provide too much heat inside if the ambient temperature outside is very cold. What you want to avoid in any event is temperature extremes. General housing design should avoid building in gaps where a Macropods foot could get in or under them then cause injury should the animal jump away with a foot in something.

Any poison vegetation should be removed from the area of course, but mostly natural vegetation will provide most of the nutrition a Macropod needs. A selection of grasses, weeds, dandelions and roots will be on the menu for the most part. In addition, we feed good quality orchard grass hay, the softer the better to avoid any

sharp awns which may puncture the gums providing a site for possible infection. A commercially produced supplemental feed pellet is also recommended, because Macropods require a certain balance of nutrients as well as selenium to maintain them properly. During the winter of course, more hay will be consumed because of the lesser quality of natural vegetation. We also provide browse in the form of apple branches and some younger maple branches to help with molar progression and strengthen the jaw, as well as to toughen the mouth. They also eat many of the leaves that fall from the maples or come from the apple branches.



*Six foot fencing seen with “T” posts covered where exposed*

**Fencing** for your enclosures should be six feet tall. Solid “Privacy” type fencing can be used where desired or where potential stress hazards exist on the other side. Open wire fencing of one sort or another is most common and many use common 2 by 4 field fencing. Chain link fencing is probably preferred because it is more forgiving should an animal run into it. Fence posts should be located on the outside of the pens if possible to protect animals that run the fence line from injuring their legs. We have designed a system by which we cover posts inside pens with rubber sheeting, attached to the adjacent fencing. This keeps legs from getting to the posts. We also recommend fencing with rounded corners for the same sake of safety for fence pacing. Wallabies and Kangaroos do not tend to try to dig out so this is not a big problem. Wallaroos will occasionally decide to dig however. We have fairly large enclosures, so we use mostly field fencing with T posts and cover the posts where they are inside the pens. In this way we hope to minimize the potential of injury to the legs. If you do not use solid “Privacy” type fencing or walls, you can consider using a sight barrier temporarily until your animals get used to the boundaries of their enclosure. We have used the 3 foot silt fencing available at Home Depot with the stakes in it already. This is very economical and easy to put up for the short duration that it may be necessary, to help minimize the possibility of injury by impact with unfamiliar fencing.



*An example of round corners and perimeter fencing*

My final recommendation in this area is that one consider, using a second “perimeter” fencing, spaced at least a

few feet away from the primary enclosure fencing. While USDA regulations require this kind of security for breeders, private ownership has no such mandate. Secondary perimeter fencing can be extremely helpful in keeping out neighborhood stray dogs and cats. These are probably the greatest two threats to the safety of captive Macropods. Dogs, because they will relentlessly chase a Wallaby back and forth, even from outside the pens, until an animal breaks its neck on a fence or dies from stress or capture myopathy on the spot. Cats are a threat because they are a source of Toxoplasmosis (once they have eaten rodents), a disease which is extremely dangerous to Macropods. Perimeter fencing can also protect your animals from being lost should they get out of their primary enclosure some how. Do not place items like hay bales or rock piles or housing near the fence where an animal might jump up on those and hop over the fence. Keep in mind that your fencing is there to keep your animals in, but it is also importantly there to keep other animals or would be predators out. Be conscious of keeping fences clear of objects that can be used to help predators over the fences from the outside of the enclosures as well.

**Medical and Health considerations** are not exhaustive for most Wallabies, Wallaroos and Kangaroos. The most important preventative medicine for general health is quality feeding, housing and care. Strong healthy animals are less susceptible to the ravages of ailments caused by everything from simple bacterial infection of cuts and scrapes, to pneumonia rooted in exposure. To that end, basically well maintained surroundings and regular removal of excess waste go a long way, Reasonable provision of cover and protection from elemental extremes, including access to supplemental heat where necessary are provisions that should go without saying. The average individual should keep on hand basic first aid supplies to help with minor injuries as with any animal. It is of primary importance to note that this type of animal does everything they can instinctively, in such a way as to hide ailments for as long as possible. Remember that it is the strong who survive so the best way to avoid being the target of predation is to appear strong, even if you are not. So it is imperative that healthy conditions exist in general. You would really prefer not to ever need to diagnose an avoidable ailment in any exotic animal. Most ailments appear first in the form of unusual behavior. Is the animal segregating itself from the rest of the mob suddenly? Hanging its head or grinding its teeth? These could be signs of illness or pain and are signs that should be recognized when they occur. Ill or injured animals should be removed from the general population and segregated to recuperate if the other animals threaten to injure them, or if they have a contagious or suspected contagious disorder..



*Feed in containers off the ground and keep water sources clean*

Certain precautions should be taken in the opinion of most animal care experts, to protect for example from Coccidial infection. Coccidia are single cell parasites found virtually everywhere and when they grow out of control, can quickly kill an animal. We treat the water supply of all our animals for one week a month with a preventative (amprolium) in that regard. Toxoplasmosis was mentioned above and is best prevented by keeping

your animals away from cat droppings. If a cat has eaten rodents, it is sure to be a carrier of the Toxoplasmosis bacteria and will transmit it through its feces. It is important with this in mind, to make certain that your hay does not have or come from places that have cats living and dropping in it. Tetanus potential can be minimized by removing any rusty metal whatsoever from contact with any animals. This includes any rusty, barbed and or sharp wire on which animals can become injured. We also administer a wormer (Ivormectin) every few months as a preventative. We do everything we can to secure our facility from entry by stray animals, feral cats and the like. Finally, we are careful to prevent injury as much as possible by maintenance and housekeeping practices, as well as by careful design of facilities to minimize hazards to little eyes, limbs and heads. These are the basics and focus on prevention. Prevention is always better than treatment in the long run.

If there is a single greatest threat to a Macropod, it would probably be stress. Wallabies and Kangaroos are flight animals whose best defense is to flee from danger. Sudden loud noises or fast moving animals or objects can trigger a panic reflex and the subsequent flight instinct takes over. Under conditions of panic, a Wallaby can suddenly forget that it is standing next to a fence and try to run right through it. If continuing to be faced with conditions resulting in panic, such as an approaching dog, the Wallaby can run repeatedly into the same fence and could potentially injure or even kill themselves doing it. You must guard against domestic neighborhood stray dogs as well as your own if you have them. There is nothing more natural than the predator dog pursuing an animal with the gentle nature of a prey animal. That which is fun for the dog, is deadly for the Wallaby. Stress can come in the form of constant and more subtle things like being constantly harassed by a small child, or even from efforts to capture to provide treatment or medication. The capture and restraint considerations of medical necessity are one of the best reasons to bottle raise "Roos". Providing medical assistance to wilder animals is always more difficult and more dangerous. Under any conditions, a stressful environment absolutely must be avoided.

If there is a single most perplexing medical condition affecting some Wallabies and Kangaroos from time to time, it is "Lumpy Jaw" and you might have guessed, is often marked by swelling in the jaw area of the face. Lumpy Jaw is actually a bacterial infection and has been known to affect other areas such as the legs and feet, where it is suspected that a penetrating injury opens the door to infection. If the bacteria responsible for Lumpy Jaw infect the bone, it becomes very difficult to treat effectively. Surgical removal of infected bone and tissue become necessary along with aggressive antibiotic therapy. Infection actually traced to the specific bacteria that is responsible for Lumpy Jaw is actually quite rare. Still, swelling and infection in the area of the jaw and face are not uncommon and must be treated quickly and decisively in our experience.

If provided with correctly designed and well maintained environmental conditions, Macropods will thrive with little difficulty. Mostly the little things will raise their head: a scraped paw or broken nail. We have even had animals pull their teeth out by biting a fence. Anything can and will tend to happen though, just like real life!! So be prepared for the little things common to your particular pet, and have a good Veterinarian available.

**In conclusion**, we are making no effort to even begin to describe the many varied medical maladies that are possible with Macropods. It is important to note that there are a number of sources of published medical and specific treatment recommendations available. This information should be obtained along with all other pertinent information when considering the acquisition of any species of Macropod or Marsupial.

We also want to make it clear that these guidelines are at their most basic, to say the least. This thumbnail outline is in no way intended to be a complete guide of care for any specific animal. It has been written in such a way as to require one to seek further information, in an effort to avoid its use as a care manual. The wide variety of existing Marsupials or Macropods for that matter, and their own individual requirements, make it impossible to provide more in the space allowed. Please do your homework. Exotic Animal care is unlike caring for the needs of the average domestic animal. If you desire to learn more, or acquire one of the animals described herein, please contact a reputable breeder and request specific information.



*“Rocky” a Red Kangaroo and “Velvet” an Albino Bennetts Wallaby*

Wallabies and Kangaroos will make incredible companions when you invest the time to hand raise them. The bond shared by the average owner of one of these larger Macropods and their pet can be unbelievable. It is most important to recognize that animals reared in this fashion become as strongly emotionally attached to us as we do them. They are purely and completely dependent on their surrogate parent for many months and one must be prepared for the rigors of raising a Baby. You will be up at 4 in the morning when baby cries and needs its “Ba-Ba.” They need you to hold them when they are frightened or cold. And they often just lay their pouch playing with their feet. They are Babies. Like any Baby, they will provide many years of joy (Joey) and love if they are nurtured and provided with consistent, thoughtful conditions. So if you choose to obtain such an animal. Please do what is best for the animal and the neighborhood at large. BE A RESPONSIBLE PET OWNER!! Thank You.

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