The Use of Oxbow's Critical Care® for Herbivores in Australian Wildlife

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Specialised Animal Nutrition Pty Ltd

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PRODUCT OVERVIEW

Critical Care® for Herbivores

A complete syringe feeding formula for herbivores that are not eating due to illness or surgery. Used and recommended by leading exotics practices across Australia and around the globe.

Forage based fibre is necessary to encourage proper microbial growth in the digestive system of guinea pigs, rabbits and other small herbivores. Timothy grass hay, the main component in Critical Care™, provides the proper balance of forage based fibre and soluble carbohydrates needed to support the natural microbial population in the digestive system of small herbivores.

> **"Fortunately in Australia we now have access to the critical care feeding formula for herbivores used in North America and Europe, e. g., Oxbow's Critical Care for Herbivores. This product comes highly recommended by the author."** *Dr. David Vella, North Shore Veterinary Specialist Centre, NSW*

> **"The use of Critical Care™ has reduced the mortality rate among critically ill rabbit and guinea pig patients by at least 40%. I would not practice rabbit or guinea pig medicine without this product on my shelf."** *Dr Gregory Rich, DVM, West Esplanade Animal Hospital, LA, USA*

> **"Oxbow's Critical Care™ has saved so many patients with GI Stasis. I have had a lot of patients referred to me that did not get better until they started on a diet of Critical Care. The clients are so grateful."** *Aubert Fitch, DVM, Glastonbury Veterinary Hospital, CT, USA*

Primary Ingredients: Timothy Grass Meal, Soybean Hulls, Wheat Germ Meal, Oat Groats, Wheat Middlings

Clinical Applications: GI Stasis, Anorexia & Inappetence, Post Spay/Neuter, Dental Disease, Post Extraction, Receiving Protocol, Molar Trimming, Severe Malocclusion, Post-surgical Care, Appetite Stimulant, Geriatric Patients, Medication Carrier, etc

Guaranteed Analysis:

Crude Protein	min	16%
Crude fat	min	3%
Crude fibre	min	21%
Crude fibre	max	26%
Calcium	min	0.40%, max 0.60%
Phosphorus	min	0.20%
Iron	min	300 mg/kg
Copper	min	18 mg/kg
Zinc	min	100 mg/kg
Niacin	min	60 mg/kg
Vitamin A	min	10,000 IU/kg
Vitamin B12	min	13 mcg/kg
Vitamin D3	min	900 IU/kg
Vitamin E	min	190 UI/kg
Vitamin C	min	10,000 mg/kg
Metabolizable Energy		24 kcal/Tbsp

Using Oxbow's Critical Care® for Herbivores in Australian Wildlife

Anne Fowler, BSc (Vet) (Hons), BVSc, MACVSc (Avian Health, Wildlife Health)

Critical Care® for Herbivores is produced by Oxbow and imported into Australia by Specialised Animal Nutrition. It is available from vet clinics that have an interest in pocket pets. It is not directly available from ebay, which is where timothy hay and rabbit/guinea pig pellets can be purchased.

The reason that I have thought that Critical Care would assist possums in particular is that possums have the same type of gut as our rabbits/guinea pigs - ie caecal fermenters. Critical Care contains finely ground hay. Hay is high in fibre and thus promotes appropriate development of normal caecal flora, unlike fruit. There are other ingredients in Critical Care, such as vitamins and pectins, that may also play a beneficial role in digestion. When it is fed, by mixing it with water, it is about the consistency of pap. It can be added to milk feeds, but is fed at a lower concentration so that the formula can still pass through a catheter-tip syringe.

We also need to remember that for the brushtail possum (Trichosaurus vulpecula), up to 30% of the natural diet may include grasses and weeds (dandelion, dock, milk thistle), so a supplement based on grasses is approaching the 'normal' diet for this species.

It is fantastic that Sydney Wildlife have taken up the challenge to try something to bring wildlife rehabilitation forward, rather than have us repeating the same old, same old for another 20 years! Particularly as they are trying to use a product designed for herbivore digestion and nutrition, rather than human infant over-the-counter treatments. Even better is the success that they appear to have had.

Would Critical Care be good for macropods? That has been the experience in the US to date. As the macropod is a grass-eating species, it would appear appropriate. Particularly when you consider that young kangaroos encourage meryicsm in their mother to ingest stomach contents (ie grass from the stomach) at the time of transitioning onto pasture. In my personal observation, sick joeys appear to prefer Critical Care to a bottle of milk. So, yes, it would be appropriate for macropods and certainly for wombats (as other grass-eating animals) as well.

I have used it with sick koalas and have seen some incredible weight gains when fed with supplementary milk. Again, it makes more sense than feeding them mashed up pumpkin! Leaves and grass are reasonably similar in nutrient profiles. Ideally, blended leaf would be added to the mixture to provide a more natural nutrient profile.

Potential uses in marsupials include:

1. Give around caecal colonisation times in healthy orphan possums, and when macropods and wombat joeys are starting to mouth and chew solid foods.
2. Give to sick orphans to assist with 'normalising gut flora' and providing a source of easily digestible energy - makes more sense to their gut than nutrigel, for example! This may be used for a 1 – 2 week period and weaned out of their diet. It may be left as a food type that is offered, along with leaf, veges with Wombaroo High Protein supplement sprinkled on them.
3. Give to sick/injured adults to either supplement their energy intake or wean them back onto solid food from a short starve or milk supplementation.

Anne Fowler: BSc (Vet) (Hons),BVSc, MACVSc (Avian Health, Wildlife Health)
Adelaide Bird & Exotics Vet Centre

Use of Critical Care® for Herbivores in Common Ringtail Possums (*Pseudocheirus peregrinus*)

Anne Fowler, BSc (Vet) (Hons), BVSc, MACVSc (Avian Health, Wildlife Health)

Digestive Physiology of the Common ringtail possum

The Common ringtail possum is strict folivore with a diet of mainly Eucalyptus leaves. Possums prefer young leaves, which have more easily digestible plant walls, when it is available. The small size of the Common ringtail possum limits the amount of leaf that it can eat, and thus get energy from. Leaf fibre is digested in an enlarged caecum where microbial fermentation occurs. Ringtail possums are caecotrophic – this means that they eat the contents of their caecum during rest in daylight hours. This is an efficient way of absorbing water and more protein from their diet and provides the possum with more than half of its digestible energy intake. The rabbit is an example of a herbivorous mammal that is also caecotrophic.

Why Use Oxbow's Critical Care® for Herbivores?

There is a great deal of similarity in the nutrient profile of leaves and grass. The high fibre grass content of Oxbow's Critical Care® for Herbivores provides an excellent substrate for the growth of bacteria required to break down plant cell walls for digestion. (One key difference is the lack of anti-metabolites in Critical Care in comparison with Eucalypt leaves).

Uses for Oxbow's Critical Care® for Herbivores

In a healthy Common ringtail possum:

Oxbow's Critical Care® can play a role in the development of a healthy, functioning caecum in orphaned animals by providing the correct substrate for normal gut bacterial development. Critical Care® can be offered as an alternative to access to adult caecotrophes.

In a sick Common ringtail possum

Oxbow's Critical Care® has been shown to be beneficial in sick Common ringtail possums. It should be used as part of the overall nutritional treatment of sick possums and not as a substitute for medical therapy where this is indicated.

1. **Caecal stasis (caecal bloat)**. The development of the normal bacteria in the caecum that are required to digest a Eucalyptus leaf diet can be altered by illness, antibiotics or by feeding a fruit-based diet. Critical Care® has been fed to Common ringtail possums from 60g onwards to assist with normal caecal development and appears to prevent the development of caecal stasis. It has been shown to be of benefit in the early stages of caecal stasis. However, other medications are also necessary for advanced stages of caecal stasis.
2. **Failure to thrive.** These cases may include possums that have had another illness, such as pneumonia, or where warmth and nutrition has been lacking. Oxbow's Critical Care® provides an accessible source of protein required to regain muscle and weight.
3. **Sick or injured adult possums.** Oxbow's Critical Care® may be used as a supplement during captivity.

Instructions for Use of Critical Care® in Common Ringtail Possums

Both the aniseed and apple/banana flavours are palatable in possums.

1. Oxbow's Critical Care® can be offered to the mouth in a syringe. It is made up by mixing 1 teaspoon of dry product with 1.5 teaspoons of warmed water.

2. If the animal is old enough to lap, the product can be mixed with milk and offered to the mouth using a syringe or offered in a bowl. Particles are too large to pass easily through a teat without increasing the size of the teat opening. Add ¼ teaspoon to 10ml of milk that has been made up to the manufacturer's directions.

3. In older possums, Oxbow's Critical Care® can be sprinkled with Wombaroo High Protein Supplement® over fruit/vegetables.

The total energy requirement of the Common ringtail possum is 266kJ/kg/d. The table below gives the maximum amount of Oxbow Critical Care® required for a Common Ringtail possum – if this was the sole food fed. This is an unlikely scenario. However, it does illustrate how a small amount can give a great deal of energy to these individuals.

Weight in Kg	Tablespoon (Dry Product)	Grams (Dry Product)
0.1	0.26	3.9
1	26	39

References
1. *Marsupial Nutrition*. Chapter 5: Hindgut fermenters – the arboreal folivores, Ed: ID Hume. Pub: Cambridge Press, 1999
2. *Life of Marsupials*, Chapter 7: Life in the trees: koala, greater glider and possum, by H Tyndale-Biscoe, Pub: CSIRO Publishing, 2005.
3. Use of Oxbow Critical Care with Ringtail Possums, B Young, Sydney Wildlife.

Where Can I Get it?
Oxbow's Critical Care® for Herbivores is available in Australia from your veterinarian or directly from: Specialised Animal Nutrition Pty Ltd, www.oxbowaustralia.com; or phone: 07 5596 4293 with veterinary approval.

Original Artwork by Daphne Cartlidge Ford, e-mail: idford@netspace.net.au

CASE STUDIES:
Use of Oxbow Critical Care® in Ringtail Possums

INTRODUCTION:

Sydney Wildlife is a volunteer organization which rescues and cares for native wildlife that is injured, sick or orphaned. Animals are rehabilitated and released to the wild. The organization specializes in the problems of urban native animals, its field covering the greater metropolitan area of Sydney. Public education, information and in-service training are part of its services. There is a 24hr. assistance line to the public which takes about 14,000 calls a year. Currently Sydney Wildlife has about 400 members.

There is a high concentration of Ringtail Possums in the northern districts of Sydney – some 600 coming into care each year, 400 of those are babies. The following notes are prepared by Beverley Young who has been the Coordinator for Ringtail Possums for 8 years and keeps detailed records of treatment and care.

USE OF OXBOW:
Carers in Sydney Wildlife have had very positive experiences with Oxbow Critical Care. These are outlined below:

CASE 1 – Male ringtail baby 120g. This possum had come into care at 60g. He had a poor history - feeding problems, fluctuating weight gain/loss, poor sparse fur development. His 3 buddies who received the same care had none of these problems. At 120g. he was starting to develop a 'spongy' enlarged abdomen and his tail and head in particular were showing signs of malnutrition and weight loss. Our concern was that he was possibly in the early stages of Caecal Stasis and a regime of treatment was put in place, with comprehensive record taking. The main thrust was in the use of Oxbow Critical Care. He was at this stage feeding himself with formula and fresh native leaves, along with his buddies. However he was taken out 3 times a day to be hand fed with diluted Lectade (hydration and electrolytes) with a sprinkling of Oxbow (about ¼ teaspoon in 10mls fluid). We found this the best way to have him take the Oxbow, it also gave him extra fluids which is part of our treatment regime. This was kept up for 3 weeks. Towards the end of this period he was filling out in the previously skinny areas, his abdomen had decreased in diameter and his fur was thickening up very well. We now started to put the Oxbow into the regular formula feeds (which meant the buddies would get it too), still supplying some extra weak lectade in the cage. The possum went on to be healthy and fit and was eventually released with his buddies at the usual 6 months of age. The rationale in using the Oxbow was to increase nutrition input, and provide fibre to assist in moving material through the caecum, and incidentally to give extra fluids. We have had many babies with similar symptoms in the past who have gone on to develop Caecal Stasis and died. We were very impressed with the results of Oxbow use.

sydney wildlife
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CASE 2: Female 100g. ringtail baby. This possum also was starting to show the signs of malnutrition and had an in-care history of poor feeding and weight gain. She did not have any abdominal bloating however. The regime we used was not as intrusive as the previous one, we just added a sprinkling of Oxbow to the regular feeds over two weeks. Weight settled to a regular gain and all signs of poor nutrition disappeared (thin face, bony tail, sparse hair growth). This one is still in care and doing well with no further intervention.

CASE 3: Female ringtail 80g. baby. This possum had been doing well but started to lose appetite and suddenly developed diarrhoea. Our usual regime for these cases is to initially take off milk formula, giving lectade only for 24hrs. When put back onto milk the diarrhoea returned - Thrush was suspected. As she had already lost a day's milk feeds I was concerned to keep up her nutrition while on further treatment. She was again taken off milk, given Nilstat for the Thrush (4 days), and her feeds were Lectade (diluted) with Oxbow , for 3 days. On the fourth day she resumed milk feeds, with Oxbow added. At the end of this treatment period she had not lost any weight, her general condition was good and she had no further diarrhoea. This possum is doing well, she is now 220g. and progressing normally.

CASE 4: Male 150g. ringtail, recently rescued. This one was just a very recalcitrant feeder, would not take formula at all and was losing weight. A sprinkle of Oxbow in the formula was enough to encourage him to start lapping and he is now doing well. The apple/banana flavour probably helped! In the past we have added a tiny amount of pure fruit juice to 'flavour' the milk with poor feeders but we have never been happy about doing this because of the sugar content, which is contra-indicated for young ringtails' digestive systems.

CONCLUDING: Our carers have been very impressed with results from the use of Oxbow and we will certainly be continuing to use it, particularly with young possums showing signs of compromised nutritional status, and the on-going problems that may result from that.

I would be very happy to discuss our use of Oxbow with Vets or other carers and nurses.
My email address is youngbevg@gmail.com

Beverley Young OAM

Use of Critical Care® for Herbivores in the Common Wombat (Vombatus ursinus)

Anne Fowler, BSc (Vet) (Hons), BVSc, MACVSc (Avian Health, Wildlife Health)

Digestive Physiology of the Common Wombat

The Common wombat mainly eats a diet of grasses with a low nutritional value. The majority of this diet is indigestible fibre from the plant cell walls. The first part of the large bowel (proximal colon) has evolved into site where energy is taken from the grass fibre. The proximal colon of the Common wombat is so large it represents 68% of the total gut volume.

The grass fibre is broken down by bacteria. There are more bacteria in the colon than elsewhere in the gut. These bacteria break down the fibre to create a source of energy for the wombat, permitting it to use low quality grasses and survive periods of food shortages that occur with drought.

The horse is the mammal with a similar digestive tract to the Common wombat. Although the Southern Hairy-nosed wombat has some subtle but significant differences in its grazing strategy and length of the proximal colon, its digestive tract is similar to the Common wombat.

Why Use Oxbow's Critical Care® for Herbivores?

Critical Care® for Herbivores is a premium grass-based recovery food which can be given to herbivores that are unwilling or unable to eat their normal diet due to injury or illness. Providing an easily digestible source of fibre to promote the development of the normal bacterial population in the proximal colon seems prudent when the digestive physiology of the Common wombat is considered. As Common wombats eat grass, a supplement with finely ground grass, as the primary ingredient, is an appropriate addition to the diet.

The addition of high sugar or high fat ingredients to the diet of wombats may be detrimental in that it may favour the growth of less desirable bacteria that prefer those conditions, and not those adapted to a high fibre diet.

Uses for Oxbow's Critical Care® for Herbivores

In a healthy wombat:

Oxbow's Critical Care® for Herbivores can play a role in assisting the wombat at the age of weaning when the introduction of solid food takes place. By providing an appropriate fibre level, the normal gut flora can be established. This can be offered at the stage that the molars have erupted and grass is being introduced for the first time. This occurs from an Age Factor of 0.6 or approximately 1.2kg onwards.

In a sick wombat:

1. Diarrhoea: Oxbow's Critical Care® has been successfully used in wombats with diarrhoea, together with medical therapy. It has been used in cases with bacterial, fungal and protozoal diarrhoea. In these instances, Critical Care® provides a source of fibre that can be readily converted into energy and helps the faeces to become firm.
2. Other diseases, for example cystitis or pneumonia: Oxbow's Critical Care® can be used as a supplement for energy during these illnesses. A grass-based diet can assist in the alkalinisation of urine. Care should be taken with offering any food item by mouth to a wombat with pneumonia to ensure that aspiration into the lungs does not occur.
3. Failure to thrive. Once it has been confirmed that there is not an infectious cause for failure to gain weight, by examination of the faeces by a veterinarian, Critical Care® may assist by providing a readily available source of energy. The protein levels are sufficient to meet the requirements of a growing wombat.

Instructions for Use of Critical Care® in the Common Wombat

Wombats may accept either the original (aniseed) or apple/banana flavour.

Making up Critical Care® for Herbivores

Except in particular cases under veterinary care, Critical Care® should not be added to the milk, but fed separately at the consistency of mousse or porridge. Addition to milk will result in less energy being offered to the wombat, and thus a greater volume will be required. As the wombat stomach is small, it is less likely to get sufficient energy before it feels full if added to milk.

Add 2 two tablespoons of pre-boiled warm water to 1 level tablespoon of Critical Care® and mix well to a consistency that can be drawn up into a catheter-tipped syringe. Although the mixture can be refrigerated for up to 24 hours, it is preferable to mix up fresh for each feed.

How to Offer:

Oxbow's Critical Care® should only be offered once wombats are warmed and adequately hydrated. Giving food to a cold, dehydrated and shocky wombat means that the food will not be absorbed by the gut and runs the risk of aspiration of the food.

Wombats are fed in an upright position – i.e. not lying on their back like a kangaroo. Critical Care® is offered using a 60ml catheter-tipped syringe. The nozzle of the syringe is placed in the mouth behind the incisors and in front of the molar teeth. Only 1-2ml per kg is offered at a time before the syringe is removed from the mouth and the wombat is permitted to chew and swallow for up to a minute before more is offered.

Amount to Offer in a Day

As wombats have a lower energy turnover in comparison to mammals, they only require 18 grams (2 tablespoons) of dry product per kilogram of body weight per day, if fed as a sole food. This is not normally recommended as both milk and free access to grasses (if appropriate for the age) should be offered wherever possible. What this does mean is that a small volume may be of benefit to the wombat. This amount may be divided into 2 – 3 feeds a day. It can be offered after, or instead of a milk feed.

References

1. Marsupial Nutrition. Chapter 4: Hindgut fermenters – the wombats. Ed: ID Hume. Pub: Cambridge Press, 1999
2. Life of Marsupials, Chapter 8: Wombats: vegetarians of the underworld, by H Tyndale-Biscoe, Pub: CSIRO Publishing, 2005.
3. Fauna of Australia, Chapter 32. Vomatidae, by RT Wells. Available online: http://www.environment.gov.au/biodiversity/abrs/publications/fauna-of-australia/fauna-1b.html

Where Can I Get it?

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Original Artwork by Daphne Cartlidge Ford, e-mail: idford@netspace.net.au

cedarcreekwombatrescue.com

“Cheeky” an 11kg female wombat came into care after suffering head trauma probably from being hit by a car. She had severe swelling to her nose making breathing through it impossible, a fracture cheek bone and a non-displaced fracture near the hinge of her jaw that was painful and prevented her from closing her mouth properly. “Cheeky” was very distressed and had to be placed on oxygen to help her breath with less effort. It really looked like she might not make it through the first night.

Wombats are obligate nose breathers and only breathe through their mouths if forced to. When they breathe through their mouths it makes it difficult for them to eat. This along with the injury to her jaw was adding to “Cheeky’s” distress.

After she was treated for shock, she needed nutrition to allow her to heal but obviously couldn’t eat grass or grain since she couldn’t breathe and chew at the same time and her jaw was painful even with pain relief.

A slurry of milk mixed with Critical Care was syringed into her mouth in small amounts every few hours. Because she couldn’t breathe and swallow at the same time, she could take a little at a time. Milk alone was not enough for a wombat her size and the added nutrition of Critical Care helped sustain her until after several weeks the swelling finally reduced allowing her to breathe through her nose and her jaw healed enough to allow her to start eating a little on her own.

She was continued on Critical Care for several months because it was a very long healing process before she was eating a normal diet or grass well enough to maintain her weight.

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CASE STUDY:
4 Year Old Wallaby

Karen Fortier runs Rain Spirit Farm in Monroe, Washington. She conducted a case study regarding the use of Critical Care® for Herbivores with a hand-reared wallaby after a relocation, anorexia, and collapse.

Intent of product use: To restore health of a four-year-old pet wallaby, unable to eat on his own. Also, to determine if Critical Care is a workable solution to feeding animals, unable or unwilling to eat due to injury or illness.

How was the diet altered? Previous diet consisted of 1.5 cups of Mazuri wallaby diet, 1.5 cups of Del's senior equine feed, 1.5 cups of vegetables (yams, apples, and carrots), 1 cup rolled barley, free choice alfalfa hay, and water. Diet was changed to three TBSP of Critical Care, mixed with water, and given nine times throughout the day.

Describe any successes or problems: Food was readily consumed and provided sufficient fiber to prevent diarrhea, even when animal was down. Also increased strength and vitality. Food was easy to prepare and feed using syringe. There was a noticeable improvement in his strength, and coat shedding decreased during the field trial.

Testimonial:

"Palatability tests with the product were done with my donkeys. They loved it, taking it readily from my hand or a pan. Then I tried a little bit with the llamas and goats. Again, they thought it a real treat!" "This product is terrific. It did an excellent job of providing nutrition to an animal unable to eat on his own. Since he liked the taste, there was no struggle to feed him and thus caused less stress than previous tubing efforts. He enthusiastically reacted to feeding, and was chewing the food readily before swallowing. He became stronger and more vigorous by the day. He began to care about living." "Despite his unwillingness to eat anything else except Esbilac, and despite his recurring bouts of colic, he never refused the Critical Care. This product has widespread application for me, as I own llamas, donkeys, goats, ostrich and wallabies."

Karen Fortier
Rain Spirit Farm
Monroe, Washington