

SHORT-BEAKED ECHIDNAS (TACHYGLOSSUS ACULEATUS): AN INSECTIVOROUS HERBIVORE

Michelle Shaw, MSc^{1} Lydia Tong, MA VetMB¹ Phoebe Meagher, PhD¹ Kate Brandis, PhD² and Debashish Mazumder, PhD³*

¹Taronga Conservation Society Australia, Bradleys Head Road, Mosman, NSW 2088, AUSTRALIA.

²University of New South Wales, High Street, Kennington, NSW 2052, AUSTRALIA.

³Australian Nuclear Science and Technology Organisation, Locked Bag 2001 Kirrawee DC, NSW 2232, Australia.

Short-beaked echidnas are considered myrmecophages, carnivores that specialize in eating termites and ants. Dogs and cats have been used as the carnivore models to develop their artificial diets. Echidnas appear to do well on artificial diets, often living 50+ years in captivity. A recent review of necropsies of echidnas at Taronga Zoo revealed pathology in captive echidnas that may have been previously dismissed as incidental due to their longevity. Between 1908 and 2007, only 7 captive births were recorded in Australia. Only four captive-bred echidnas survived beyond 18 months of age in the American zoo population between 1903 and 2011. Nutrition may be the fundamental issue which underlies poor reproductive success. Stomach lesions seen in captive echidnas are reminiscent of ruminal acidosis gastritis which is instigated by large amounts of highly digestible carbohydrate and low fiber levels in herbivore diets. Taronga introduced a diet with lower simple sugars and added cellulose in 2014 and has since had echidnas born each year. Another Australian zoo made a similar diet change years earlier and in the last decade bred 13 echidnas. Stable isotope analysis (SIA) shows a $\delta^{15}\text{N}$ value in wild echidna quills which positions echidnas in a trophic level similar to deer. Initial results from isotopic analysis and application of diet mixing model in conjunction with stomach morphology, pathology, pH, and microbiome indicate that short-beaked echidnas are more similar to herbivores than carnivores.