

IN VITRO PROCEDURES TO PREDICT DIGESTIBILITY OF BAMBOO AND OTHER FOOD ITEMS BY RED PANDAS USING FRESH FECES AS A SOURCE OF INOCULUM: PRELIMINARY RESULTS

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ABSTRACT

The objective of this project was to produce an *in vitro* digestion system that may precisely estimate the dry matter digestibility of various feedstuffs commonly utilized in the feeding of red pandas. The three substrates evaluated in this system were MarionTM Leaf Eater Food (Marion Zoological, Inc; Plymouth MN), Mazuri® Leaf- Eater Primate Diet (Land O'Lakes Purina Feed, Gray Summit MO), and Japanese arrow bamboo (*Pseudosasa japonica*) leaves. The *in vitro* digestion system was divided up into three stages, Stage I, Stage II, and Stage III, replicating gastric, mid-gut, and hind-gut digestion respectively. The fecal inoculum used in stage III was made from freshly collected feces and acted as the microbial source. The tubes were then incubated at four different stage III times, 0 hours, 2 hours, 4 hours, and 8 hours, in an attempt to distinguish which provided the most accurate depiction of actual dry matter digestion in the red panda. The residue amount within the tube was subtracted from the original amount of feed to determine the *in vitro* dry matter digestibility of the substrate. The *in vitro* dry matter digestibility values for all three incubation times suggest that the *in vitro* digestion system significantly underestimates *in vivo* dry matter digestibility, though precise results are achievable when anaerobic incubation conditions were maintained. By increasing the time during stage III incubation, an elevation in dry matter digestibility values should be seen, allowing us to better mimic the *in vivo* digestion trial results. An accurate and precise *in vitro* digestion system could have a practical use when determining appropriate supplements within the diet of the red panda for a wide variety of feedstuffs.