## The effects of short-term omeprazole on serum gastrin and chromogranin A, as markers of rebound gastric hyperacidity, in the horse

Benjamin Sykes, Massey University, New Zealand
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In humans, discontinuation of omeprazole can be associated with a marked rebound in stomach acid production that results in severe abdominal pain. This is stimulated by excessive production of the hormones that stimulate stomach acid production and proliferation of the cells that signal for acid secretion into the stomach. Together, these factors result in a markedly increased capacity for gastric acid production when omeprazole is stopped. Observations within the racing population at The Hong Kong Jockey Club (HKJC) suggest that such an effect may be occurring with stomach ulcers documented to develop within the current withholding period of omeprazole for racing (a shorter than expected period).

We hypothesize that; short duration (8-week) administration of omeprazole will result in increases in the hormones responsible for acid secretion (serum gastrin and chromogranin A (CgA)); and, any changes induced by the above will resolve within 4 weeks following the discontinuation of therapy.

Collection of blood samples has already been partly performed as part of an ongoing study at the HKJC to compare the impact of two withholding periods on the prevalence of stomach ulcers at the time of racing in Thoroughbred racehorses. Fourteen Thoroughbred racehorses in mock training were used to compare two withholding periods for racing ("2 clear days" vs. "Not on race day"). Horses were randomly allocated into two groups. Both groups received a total of 8 weeks (excluding withholding days) of omeprazole at the treatment dose. Group A were subjected to the "2 clear day" withhold at the end of week 4 and to the "Not on race day" withhold at end of week 8. Group B were subjected to the "Not on race day" withhold at the end of week 4 and to the "2 clear day" withhold at the end of week 8. Baseline examination of the stomach (gastroscopy) was performed on day 0 and gastroscopy has been repeated pre-, and post-, each withdrawal period. Blood samples were collected from all horses to follow levels of gastrin and CgA over time. Samples were collected prior to morning feeding on day 1 of each study week. Horses have completed the administration phase of the study. They will now be sampled weekly for a further 4 weeks to assess the persistence of any observed changes in blood levels of gastrin and CgA over time.

Serum gastrin and CgA concentrations will be determined by ELISA at Massey University. A commercially available ELISA kit for gastrin will be used and validation work for equine CgA will performed as part of the study with a heuristic approach to be taken. Documentation of such changes and their persistence will provide valuable information for formulating evidence-based protocols for using omeprazole most effectively and safely. Further, validation of an ELISA for CgA is an important step for further work evaluating the effects of both short- and long-term administration of omeprazole in the horse on both gastrointestinal and bone health.