

# Reverse peristalsis in the chicken digestive tract

I.R. Godwin and W.J. Russell

Department of Physiology, University of New England, Armidale NSW 2351

Recently a uniquely avian myoelectric pattern has been demonstrated in the muscularis of the chicken intestine (Clench and Mathias 1992). Termed the rhythmic oscillating complex (ROC), this myoelectric complex occurs during fasting and involves a very rapidly propagated (25cm/s) series of spike bursts that periodically change direction in a highly organised way. About 37% of these spike bursts are orad with the remainder being aborad. A ROC lasts about 7.5 minutes. Immediately after a ROC, normal fed pattern migrating myoelectric complexes recommence. Godwin (1995) suggested that the purpose of these ROCs may be to move caecal digesta back to the duodenum when an animal is hungry, providing an internal alternative to coprophagy.

The present study was designed to investigate if these electrical recordings actually translate into aborad digesta movement. Twenty broiler chickens were fed a commercial broiler diet *ad libitum*. After 6 weeks 10 of the birds were fasted for 4 h. One ml of 100mg/l CrEDTA solution was introduced into the cloaca of these birds via a syringe. They remained fasted and were killed by decapitation after 1 to 2 h. The other 10 birds were *ad libitum* fed throughout and received a similar cloacal injection of CrEDTA. After death the digestive tracts of all birds were removed and quickly ligated at the rectum, iliocaecal junction, proximal duodenum and proximal to the proventriculus. Each segment was flushed with water to remove digesta for Cr analysis.

The distribution of the injected marker is shown in Figure 1.

Fasting resulted in over 65% of the injected CrEDTA still being present in the bird after 2 h. The data also show that CrEDTA rapidly moves in an orad direction in the fasted bird, with considerable marker being recovered in the stomachs and crop (data not presented). The fed birds showed some slight retention of marker in the lower gut with no CrEDTA being recovered from the stomachs.

The phenomena of reverse peristalsis in chickens is highly effective in the fasted bird, but appears to play little role in the fed animal.

## References

- Clench, M.H. and Mathias, J.R. (1992). A complex avian intestinal motility response to fasting. *American Journal of Physiology* 262, G498–504.
- Godwin, I.R. (1995). Motility of the Digestive Tract of Chickens. *Proceedings of the Australian Poultry Science Symposium*, 7, 172–175.

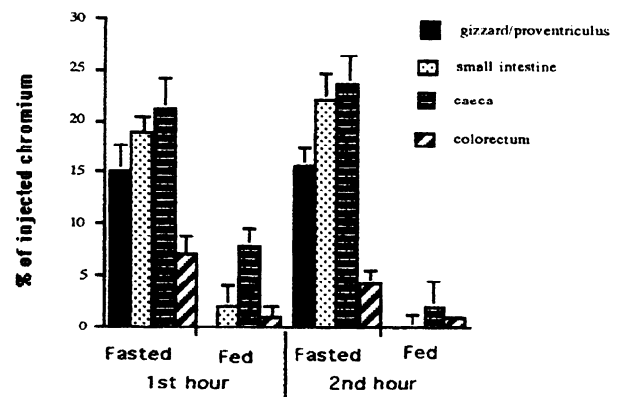


Figure 1 The effects of fasting on orad transit of cloacally administered CrEDTA.