British Poultry Science
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/cbps20

Efficiency of the cloacal sexing technique in greater rhea chicks (Rhea americana)

G. Bazzano [a], A. Lèche [a], M.B. Martella [a] & J.L. Navarro [a]
[a] Centro de Zoología Aplicada, Universidad Nacional de Córdoba, Córdoba, Argentina

Version of record first published: 17 Sep 2012.

To cite this article: G. Bazzano, A. Lèche, M.B. Martella & J.L. Navarro (2012): Efficiency of the cloacal sexing technique in greater rhea chicks (Rhea americana), British Poultry Science, 53:3, 394-396

To link to this article: http://dx.doi.org/10.1080/00071668.2012.692470

British Poultry Science Volume 53, Number 3 (June 2012), pp. 394–396

Taylor & Francis
Taylor & Francis Group

SHORT COMMUNICATIONS

Efficiency of the cloacal sexing technique in greater rhea chicks (*Rhea americana*)

G. BAZZANO, A. LÈCHE, M.B. MARTELLA AND J.L. NAVARRO

Centro de Zoología Aplicada, Universidad Nacional de Córdoba, Córdoba, Argentina

Abstract 1. The feasibility and accuracy of the cloacal sexing technique in greater rhea chicks was assessed using chicks of two captive populations of greater rhea in Córdoba, Argentina.
2. A total of 46 greater rhea chicks of 2 to 3 months of age were randomly arranged into three groups and the members of each group were sexed by a different operator.
3. A feather of each chick was plucked for sexing through a molecular method and results were used as controls.
4. Sex was correctly assigned by cloacal inspection in 98% of the cases. Chick manipulation was easily performed and no infections or traumatic lesions were observed *a posteriori*.
5. Cloacal sexing of rhea chicks up to 3 months of age does not affect animal welfare and should be considered an efficient alternative to molecular methods.

INTRODUCTION

The greater rhea (*Rhea americana*) is the largest flightless bird in South America, reaching 93–140 cm in height and 22–28 kg in weight. At present, this species has conservation and economical relevance: while farming of greater rheas has multiplied during the last two decades, their free-ranging populations have been detrimentally affected by human activities (Navarro and Martella, 2008).

An efficient management of flocks on farms frequently requires sexing the birds at early ages. However, this is very difficult to accomplish in the greater rhea because these birds show low sexual dimorphism during the first 18 months of life (Carbajo *et al.*, 1997). Although a molecular method has been recognized as an efficient tool for sexing rheas because it is non-invasive and extremely accurate (Rossi Fraire and Martella, 2006), it is still expensive and frequently not available. For this reason, we assessed the feasibility and accuracy of the cloacal sexing method, which involves physical examination of the genitalia.

METHODS

The study was conducted on chicks of two captive populations of greater rhea in Córdoba, Argentina (Córdoba city zoo and 'El Manzano', a commercial farm). The breeding stocks of these populations were hatched in captivity; however, there are no differences in genetic variability between captive-bred stocks and wild populations of central Argentina (Alonso Roldán *et al.*, 2011). A total of 46 greater rhea chicks obtained from artificial incubation were identified at birth with numbered Velcro leg bands. Chicks of 2 to 3 months of age were randomly arranged into three groups composed of 12, 14 and 20 animals, respectively. Each group of individuals was sexed by a different operator, using the cloacal sexing method. All operators previously received the same basic training. In addition, a feather of each chick was plucked and preserved for sexing the

Correspondence to: Gisela Bazzano, Centro de Zoología Aplicada, Universidad Nacional de Córdoba, Rondeau 798, 5000 Córdoba, Argentina. E-mail: gbazzano@yahoo.com or gbazzano@efn.uncor.edu

Accepted for publication 7th December 2011.

ISSN 0007–1668(print)/ISSN 1466–1799 (online)/12/030394–3
http://dx.doi.org/10.1080/00071668.2012.692470

individual by means of a molecular method (Rossi Fraire and Martella, 2006), and the results were used as controls.

To perform cloacal sexing correctly, the operator has to place the chick on its side on the floor, and an assistant must grab both legs firmly (Figure 1a). Then, the operator must evert the cloaca using both hands, gently pulling to the front with the thumb and forefinger until the phallus or clitoris is exposed. In males, the phallus is observed as a little whitish appendix of corkscrew shape (Figure 1b), whereas in females the clitoris is distinguished as a little blunt prominence, more reddish and smaller than the phallus, and may have tiny protuberances on its sides (Figure 1c). To perform this technique without causing any harm to the animals, gentle manipulation is necessary to prevent the occurrence of cloacal prolapses, and latex gloves are recommended for cleanliness and prevention of disease transmission from bird to bird.

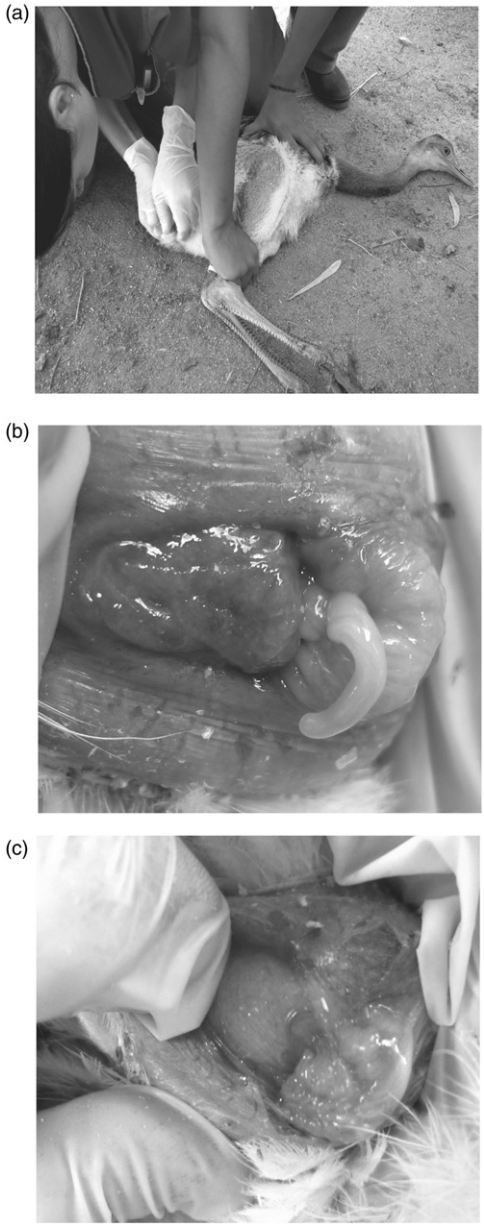

Figure 1. *Cloacal sexing of greater rhea chicks (Rhea americana): (a) handling and position of the chick for sexing; (b) male genitalia; (c) female genitalia.*

RESULTS AND DISCUSSION

Sex was correctly assigned by cloacal examination in 98% of individuals (only one chick was wrongly identified as a female by the operator that examined the cloaca). Therefore, the error rate (2%) in this study was much lower than the 40% mentioned by Malagó *et al.* (2005), who used the same technique in ostrich chicks of similar age as the rheas we employed. On the other hand, some authors suggest that this technique may lead to stress, bleeding (Malagó *et al.*, 2005), prolapses and infections to ratite chicks (Huchzermeyer, 1998; Soley and Groenewald, 1999). Nevertheless, in this study, with appropriate care and handling of chicks, the cloacal examination technique was easily and efficiently performed and no infections or traumatic lesions were observed *a posteriori*. The technique can also be used in sub-adult and adult rheas; however, the presence of at least one additional assistant is necessary to firmly and safely restrain and handle the animals. Because of the large body size and strong legs of greater rheas, it is difficult to evert their cloaca for examination, and the chances of injuring the birds during the process are high. At the same time, kicking by the rheas can injure themselves or the operators.

In conclusion, cloacal sexing of rhea chicks up to 3 months of age does not affect the animals' welfare and should be considered an excellent alternative to molecular methods, because it is safe, accurate, fast, comparatively inexpensive and can even be routinely performed (with minimal training) by the personnel in charge of the management of the farm.

ACKNOWLEDGEMENTS

We are grateful to the Zoo of Córdoba city and T. Caferatta for their collaboration. This work was funded by the Ministerio de Ciencia y Tecnología of the Province of Córdoba, the Secretaría de Ciencia y Técnica of the Universidad Nacional de Córdoba (SECyT-UNC), the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) and the Agencia Nacional de Promoción Científica y Tecnológica (FONCYT-PICT 2007). JLN and MBN are researchers of CONICET and GB and AL are fellows of same institution.

REFERENCES

Alonso Roldán, V., Navarro, J.L., Gardenal, C.N. & Martella, M.B. (2011) May captive populations of Greater Rhea (*Rhea americana*) act as genetic reservoirs in Argentina? *Zoo Biology*, **30**: 65–70.

Carbajo Garcia, E., Castello Fontova, F., Castello Llobet, J.A., Gurri Lloveras, A., Marin, M., Garcia, J.M., Sales, J. & Sarasqueta, D.V. (1997) Cría de Avestruces, Emúes y Ñandúes. [Breeding of ostriches, emus and rheas.] Real Escuela de Avicultura (Ed.), Areyns de Mar, Barcelona, Spain, Real Escuela de Avicultura.

Huchzermeyer, F.W. (1998) *Diseases of Ostrich and Other Ratites*, (Pretoria, South Africa, Agricultural Research Council).

Malagó, W., Medaglia, A., Matheucci, E. & Henrique-Silva, F. (2005) New PCR multiplexes for sex typing of ostriches. *Brazilian Journal of Biology*, **65**: 743–745.

Navarro, J.L. & Martella, M.B. (2008) The relevance of captive breeding to conservation of native ratites in Argentina: an overview. *Australian Journal of Experimental Agriculture*, **48**: 1302–1307.

Rossi Fraire, H.J. & Martella, M.B. (2006) DNA test applied to sex the lesser rhea (*Rhea pennata pennata*). *British Poultry Science*, **47**: 375–377.

Soley, J.T. & Groenewald, H.B. (1999) Reproduction, in: Deeming, D.C. (Ed.) *The Ostrich, Biology, Production and Health*, pp. 129–158 (New York, CABI Publishing).