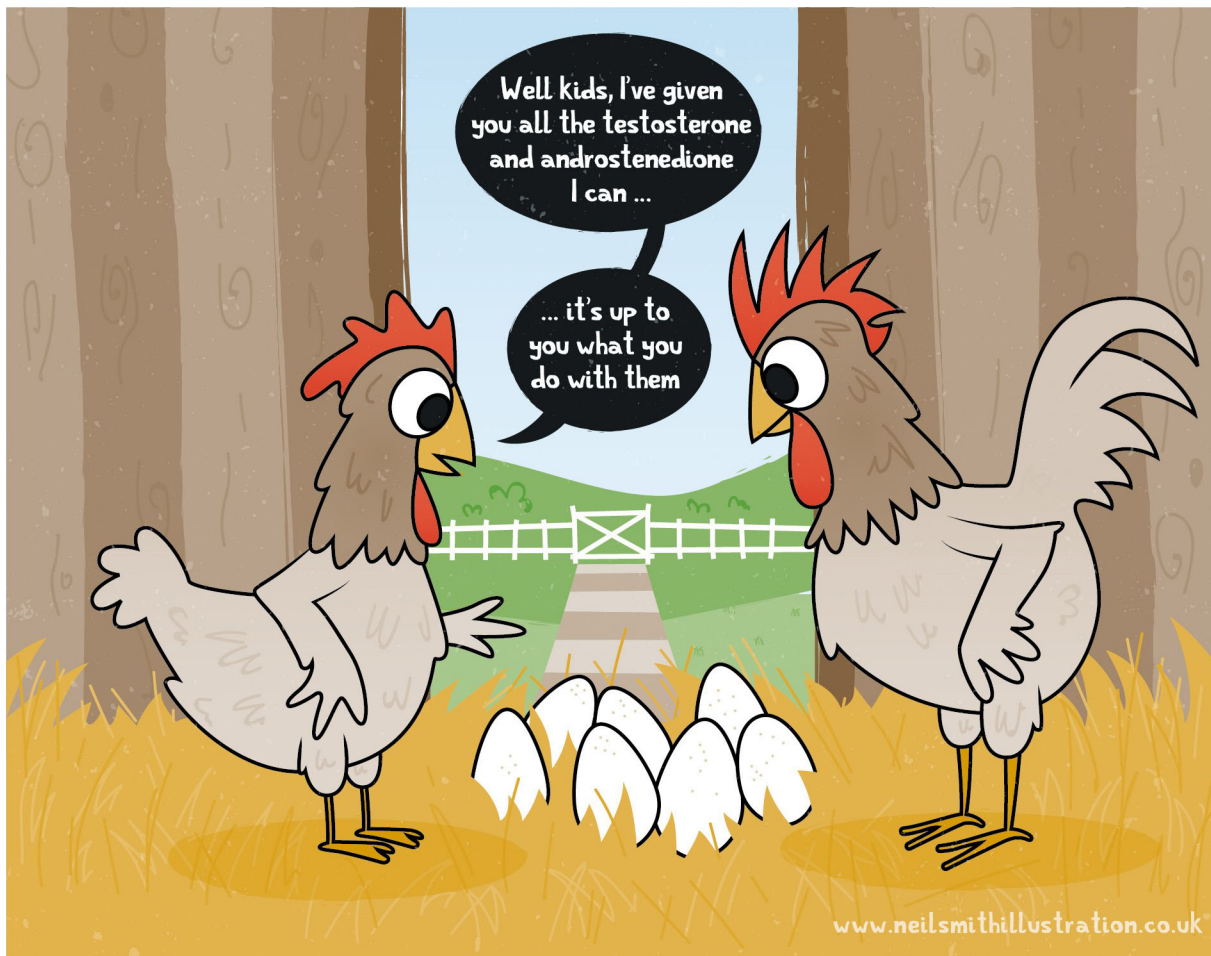


INSIDE JEB

Key hormones disappear early from egg



It's easy to see how a mother can influence her embryos when they hitch a ride inside her during development, but what about offspring that develop in an egg outside of their mother's body? How do mothers impact their development when the offspring are parcelled within a shell? Neeraj Kumar from the University of Groningen, The Netherlands, and colleagues explain that female birds deposit hormones in the yolks of their eggs prior to fertilization; however, it was unclear how and when developing embryos react to these powerful chemical messengers. 'In order to be functional, these maternal hormones must reach the offspring's tissues', say Kumar and Ton Groothuis. So the duo, along with other

colleagues from Groningen and the Max Planck Institute for Ornithology, Germany, injected testosterone and its precursor (androstenedione) into the yolk of chicken eggs to investigate whether the developing chicks absorbed them and which compounds, if any, they were broken down into.

After incubating the eggs for 5 days, the team analysed levels of the injected hormones in the embryo, and the remaining egg yolk and albumen, and discovered that both hormones had disappeared. However, they had not been absorbed by the developing embryo, suggesting that they had been digested by enzymes in the egg during the early

stages of incubation. So, testosterone and androstenedione do not appear to directly affect how chick embryos develop – they are broken down instead – and the authors suggest that chick embryos may use these breakdown products in place of the hormones provided by their mothers to direct their development.

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Kumar, N., van Dam, A., Permentier, H., van Faassen, M., Kema, I., Gahr, M. and Groothuis, T. G. G. (2019). Avian yolk androgens are metabolized rather than taken up by the embryo during the first days of incubation. *J. Exp. Biol.* **222**, jeb193961.

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