Runner Duck Eggs

Mike Ashton asks: what colour should they be?

'The Runner cannot help but lay large, white and green shelled eggs of a most delicious flavour.' Levi D. Yoder, Natural and Artificial Indian Runner Duck Culture (Pennsylvania, 1910).[1]

There is a trio of exhibition Fawn-and-white Indian Runners outside the window. One duck lays white eggs. The other lays pale green ones. That is how we can tell the parentage. Sometimes a duck will lay a slightly smaller egg than her sisters', especially if she is a young bird. Sometimes the egg from one will be a slightly different shape from that of another. There is always slight variability within a flock, giving additional information about who lays what. These are useful management aids.

However, it's been a bone of contention: 'What colour should Indian Runner eggs be?' Recently we had an enquiry from a breeder who was worried that his bird laid white eggs. He had been told that Runners' should be green. Go back a hundred years and one might well have found breeders panicking that they should in fact be white. What is the answer, and why should it matter?

The nests belonging to wild mallards seem to contain pale green eggs. It might have been important for farmers to tell the difference between their domestic stock and wild intruders. Egg-shell colour might have become a badge of purity in some instances.

Egg Shape and Colour

Throughout the bird world there is tremendous variation in size, shape and shell colour. Birds that lay just one egg in a season can afford to expend more bodily resources (per egg) than those that lay a clutch. A kiwi, for example, can lay an egg about 25% of the female body weight. That is huge. I have seen an X-ray photograph of a kiwi in lay, and it was horrifying. A humming-bird can produce an egg of just 0.3g. An ostrich's might be 1600g (a mere 1% of the mother's weight).

All eggs are 'rounded'. They have a smooth 'bolus' shape that allows easy passage along the oviduct. Owls tend to produce almost spherical eggs, but many birds have to maximize volume in relation to the geometry of the pelvic bones. The deeper the pelvis: the rounder the egg. To compromise, most eggs are 'oval', a word that means 'egg shaped'. This is a variation of the ellipse, with one end more bulbous than the other. The evolution of this characteristic is easy to understand if you think of a sea-bird laying its clutch on an exposed cliff ledge. Round or elliptical eggs might roll off into oblivion. Pyriform (pear-shaped) ones tend to roll in tight circles! They are more likely to stay on the ledge. Additionally, pyriform eggs of ground-laying species fit into neat clutches of four, easily covered by the hen plover, for example.

The colour is laid down in the thick, calcium-rich testa of the shell. The pattern tends to be in the cuticle, the outer protective layer. It is only in the later stages of the egg's passage along the oviduct that the markings are applied by pigment-secreting areas of the uterus. I imagine a sort of spiral production line with little paint guns

firing at given intervals. If the production line is quite fast there will be streaks or elongated marks. If it is slow, there may be round spots or even bands.

Evolution has played a massive role in terms of correlating pattern with habitat. Birds that lay in caves or holes tend to have plain whitish eggs. Those laying in the open have often evolved cryptic patterns: they camouflage the eggs against a background of pebbles, leaves or plants. The colours essentially are made up of two groups of pigment: porphyrin (reds and browns) and cyanin (blues and green). Ducks frequently hide their nests in vegetation, hence there is little need for elaborate protective markings. [Ref. Brooke and Birkhead, Cambridge, 1991]

Indian Runner eggs: two from the Fawn-and-white ducks and the very dark one from a Black Runner who had just started to lay again after a short rest. You can see how easily the black pigment can be rubbed off the surface cuticle. The pale green egg is more deeply stained in the hard shell.

Genetics

'The wild mallard lays a light buffish-green egg. Most domestic ducks produce eggs with either greenish-blue or white shells. Mazing (1933) found that the gene for white shell color was recessive but the abstract of his work does not specify whether it is sex-linked or autosomal. Since no symbols were presented in the report, G+ is suggested for the dominant green egg shell gene of the wild-type.' F M Lancaster, in Poultry Breeding and Genetics ed. R D Crawford (1990).

In a recent communication (6 July 2010) Lancaster analysed Mazing's results and concluded that the gene must be autosomal (i.e. not sex-linked). He points out that egg shell colour is one of those awkward genetic characters which are difficult to investigate because of their biological limitations.

- 1. It is a character of the female who lays the egg, not the embryo inside the egg.

- 2. It is sex limited, which means that it can only be expressed in the female parent. The male has no phenotype and has to be progeny-tested through his daughters.
- 3. The female's phenotype cannot be determined until she is mature and starts laying.

He does point out that this information might be of practical use if a breeder wanted to get rid of green eggs from the laying stock. What is not possible, he asserts, is to get rid of green eggs by only hatching from white ones. 'This is because the embryos could have been fathered by a green-egged male (GG or Gg). It only takes one very fertile "green" male to spread green eggs throughout the flock. Progeny-testing suspected males against known homozygous "white" females is the only way to remove male carriers of green eggs.'

Runner Eggs

I do not believe that the colour of Indian Runner eggs was ever specified in the very first published standards in Great Britain, which were drawn up by the Waterfowl Club and incorporated into the Poultry Club Standards of 1901. Six years later, however, the newly formed Indian Runner Duck Club published its own 'Standard and Rules'. Page 4 makes references to the desired size and shape of the adult birds, specifying that this should be sufficient for 'layers of a great number of large white eggs.' Lewis Wright's 1902 edition of The Book of Poultry also states 'The eggs are white in colour, and average five or six to the pound, being large for the size of the birds, and quite delicate in flavour.'

Dr. C S Valentine, writing from the USA in 1911, recorded letters from fellow breeders who were on the lookout for white-egg Runners. They complained that they had been 'buncoed', one getting 'all colours, many being white' from his Fawn-and-white Runners, the other got 'fine layers of large pale green and white eggs.' In a publicity pamphlet (urging readers join the 'Cumberland Runner Club') in 1914, she went further and explained what was going on in her own stock: Success Farm carries three groups of Runners: The Whites, the Cumberland Penciled, and the birds of union blood known as 'Cumberland-Fairy-Fawns.' The name shows the two bloods, both recognized as strictly pure. These modified 'Fairies' have the same markings as the Cumberland Penciled Runners.[2]

Our Cumberland Penciled Runners and our White Runners are strictly White-Egg stock. The Cumberland-Fairy-Fawns differ only in having had one infusion of blood from the recently found native Indian stock, known as 'Fairy Fawns.' They are a strictly pure combination of stocks. The very best type of the Fairy Fawns discovered laid a pale green egg. About four years ago, this Fairy Fawn blood was bred with the Cumberland blood. No green egg blood has since been added; nor have any but white-egg mothers been bred in any year since.

So, at this time in history, before the 1914-18 War, the pressure was for white-egg Runners, just as in the newly created Khaki Campbell. Joseph Walton's imports must have included green-egg layers and subsequent attempts to 'purify the breed' may have proved useless. Indeed, Lewis Wright's 1912 edition of The Book of Poultry contains an extensive quote from Walton himself, comprising most of the section on Indian Runner Ducks in the book (pp. 561-564). On page 563 he says merely that: 'The eggs are large for the size of the birds; and mostly white in colour of shell.'

Nowadays, egg colour would seem to indicate little about the quality of the pure Runners. Eggs vary from pearly white to blue green in many plumage colour varieties. It is only in Black Runners (including Chocolate) that one might notice a tendency to have 'sooty' outer shells on some of the first eggs of the season. Later eggs can be a white as those of other Runners. You find similar 'blackish' shells on the early clutches from Black East Indian and also Cayuga ducks.

To conclude: is there any need to worry about egg colour? I don't think so. It's better to choose an egg from what you know are exhibition quality parents, with a good track record for sound offspring. A white egg alone is no guarantee of a true Indian Runner—nor indeed is a green one.

Footnotes

1 'I myself, a breeder of Runners for six years, heretofore bred them only for pleasure, but find them to be profitable, and intend breeding them hereafter in large flocks for their egg yield.'[p.27] Yoder's stock appears to predate Walton's 1909 imports, suggesting that the egg colour was by no means consistent in the early days of the twentieth century.

2 These terms would seem to distinguish between varieties already in the USA. 'Penciled Runners' were what the British called 'Fawn-and-whites'. 'Fairy Fawns' appeared in the British press to apply to Fawn Runners imported by Joseph Walton from Lombok and Java in 1908-9. Bred to existing British stock, these formed the foundation for the future exhibition birds.

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