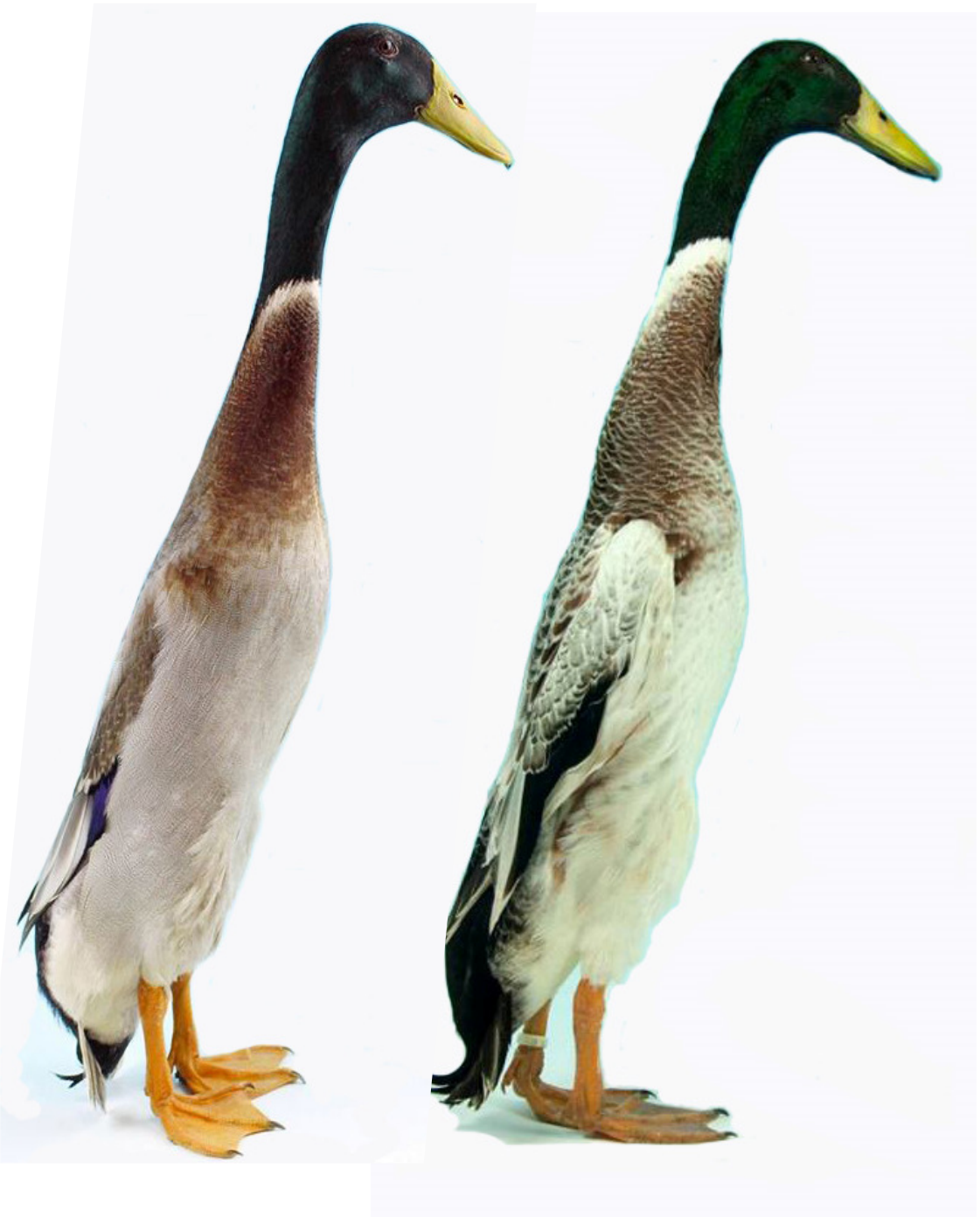
I R D C April 2023



CONTRASTING COLOURS

Silver drake with white collar completely encircling the neck, and pale belly feathers; both of these features are typical of harlequin phase (lih/lih). The amount of light feather depends upon the influence of colour enhancers which can add eumelanin/phaeomelanin and can reduce the pale 'silver ' effect. Claret feathers generally stray along the upper flank in (lih /lih) male birds.
The tail feathers (retrices) should be black; there can be a thin border of white. The smaller feathers of the rump and undertail are black
The standard Silver colour of Harlequin birds such as the Silver Runner, Welsh Harlequin and Abacot Ranger is thought to be dusky mallard (md/md) pattern. The precise breeding programme of Ross Rollman (Australia) has pointed to the fact that M+ plumage features (such as eye stripes and the 4 spot mallard in duckling fluff) can be hidden by pure harlequin phase. This was indicated in F M Lancaster (1953). Thus the (md/md) status of harlequin birds should be viewed with suspicion. The presence of M+ should introduce colour faults in standardized dusky birds such as the Abacot Ranger and Silver Runner. However, in some cases, the effect of M+ may not be so evident, especially if there is a heavy overlay of colour enhancers which clearly cover up the M+/M+ eye stripes e.g. in the Australian Elizabeth and Watervale breeds.

The light phase **Trout drake** (li/li) always shows a greyer belly than the Silver. In contrast to dark phase Mallard (Li/Li), the Trout has a ragged claret bib and a patch of white feathers at the stern adjacent to the dark undertail.
The tail feathers (retrices) are a lighter colour than the Silver's. The females and the males, both in the fluff and adolescent plumage, show the presence M+/M+.

These two drakes were each Best Runner at major shows with large entries in 2015 and 2019.

IRDC

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SECRETARY

It feels as if we will never get back to normal, with respect to avian flu. Stakeholder meetings have continued with Defra, but the number of people attending the Teams meeting has tended to fall from over 100 to around 60 as time has gone on.

In the United Kingdom, there have now [1] been 178 confirmed cases of highly pathogenic avian influenza (HPAI) H5N1 since 1 October 2022:

150 cases in England / 21 cases in Scotland / 6 cases in Wales / 1 case in Northern Ireland (22/04/2023)

The number of UK cases has been falling so, from April 18, the housing order is lifted [2]. However, there is a plea to continue with biosecurity measures; we do not know what this virus has in store.

International Disease Monitoring Update in February
Along with this unprecedented number of UK cases has been H5N1's serious spread down through North America into the southern hemisphere.

- APHA [UK} noted in March that poultry outbreaks were coming down (20 per week, down from 60-70/week in December) but the wild bird cases were increasing.

- In February, H5N1 spread across the USA and to the south-east of Canada. It is also in Mexico, the Caribbean, north-west South America, west coast of Chile, northern Argentina, east coast of Uruguay and Bolivia. Canada reported 8 poultry outbreaks; and the USA 27 plus findings in wild birds and mammals. There have been 8 wild bird cases in Mexico; 1 brown pelican in Guatemala; 1 poultry outbreak, 1 pelican and 1 peregrine in Costa Rica; 2 poultry outbreaks and 2 brown pelicans in Panama; 1 lion in a zoo in Cuba; 2 poultry outbreaks in Colombia; 13 poultry outbreaks and 1 swallow in Bolivia; 54 seabirds (mainly pelicans) in Chile; reports of dead sealions in Peru; 2 poultry outbreaks and 2 Andean geese in Argentina, and 1 black-necked swan in Uruguay.

- In Europe, H5N1 is spreading north. There were clusters of confirmed cases in Belgium, the Netherlands, southern Denmark and north Germany, the Czech Republic, northern Austria, Hungary, Poland and northern Italy and Slovenia. Many of these incidences were in wild birds.

- Looking at USDA, poultry outbreaks were levelling off with, in Febru-

ary, 5 commercial poultry outbreaks (down from 6 in January and 25 in December) and 19 backyard outbreaks (down from 22 in January and 37 in December). In February there were 6,218 wild birds.

- In Great Britain, the risk of incursion of highly pathogenic (HPAI) avian influenza H5 in wild birds was still assessed as very high (i.e. event occurs almost certainly).

Risk of spread to other species

In the 2000s, it was rare to find mammals affected by H5N1. People were infected: women who had plucked swans in Kazakhstan, and also Indonesians who had consumed raw chicken blood. But this time, the incidences of H5N1 to mammals seem greater. Reuters reported [3] that bird flu has killed tens of thousands of birds, mostly pelicans, and at least 716 sea lions in protected areas across Peru, as the H5N1 strain spread throughout the region.

Recent cases of infection in foxes, otters, cats and grizzly bears have occurred in the United Kingdom, France and the United States. These infections have been in predators which have eaten dead, infected material.

Although H5N1 is well adapted to infection of birds' lungs there is the worry that the virus could adapt to infect the mammalian respiratory tract more easily.

Perhaps with this potential disease transmission in mind, and with the prospects for 2023-2024 unknown, Defra is now expanding the Poultry Registration scheme.

1 https://www.gov.uk/government/news/bird-flu-avian-influenza-latest-situation-in-england
2 https://www.facebook.com/photo?fbid=601484468677774&set=a.582442270581994
3 https://news.cgtn.com/news/2023-02-25/Bird-flu-kills-sea-lions-in-Peru-1hI3zlArSSc/index.html

Registration of birds: comments for consultation process to be received by the end of May

It's currently mandatory for UK poultry keepers to register their birds if there are more than 50 on the premises [1].

But moves are afoot to extend compulsory registration down to even one bird. The reasoning is that such records will assist Defra in contacting all

keepers in the UK the event of an outbreak. Significantly, this will assist Defra in tracing all captive birds within a 3km protection zone or 10km surveillance zone surrounding an outbreak. Details of current situations are updated on the Interactive Avian Influenza Disease map [2].

Have your say on registration by completing the form 'Give us your views' available on this link

https://consult.defra.gov.uk/poultry-register/all-birds-registration2023/

It is possible to send in a breed club response for this survey but this would be viewed as a bloc response, and differently from individual responses. So, it benefits us all if you give your personal views.

The form gives quite a small box to give your view if you have several things to say - and it works best (when you have reviewed the form) to paste in (from a Word file) any lengthy answer. Maybe they did not anticipate lengthy answers!

Press release from Defra [3]

- Views sought on new registration rules for all bird keepers in Great Britain
- New rules would require all bird keepers to register their birds and update information annually.
- Proposal is part of government action to tackle avian influenza.

The new rules would apply to all keepers, no matter how many birds they have. At present only those who keep 50 birds or more are required by law to do so. They would also be required to update their information on an annual basis.

By registering their birds with the Animal and Plant Health Agency (APHA), keepers will ensure they receive important updates such as any local avian influenza outbreaks and information on biosecurity rules to help protect their flocks from the threat of avian influenza.. This will enable the government to communicate with bird keepers quickly, to manage potential disease outbreaks, such as avian influenza, and limit the spread.

The new rules would cover owners of backyard flocks, birds of prey and pigeon fanciers, but would not affect pet birds kept entirely inside a domestic dwelling, such as a parrot or budgie kept in a cage indoors which never

leaves the property other than to visit a vet or another short-term period….

The consultation proposals take forward the recommendation from the 2018 Dame Glenys Stacey Review and lessons identified from the 2021/2022 highly pathogenic avian influenza (HPAI) H5N1 outbreak and previous HPAI outbreaks.

Bird keepers will need to provide information including their contact details, the location where birds are kept and details of the birds (species, number and what they are kept for).

A 12-week joint GB-wide consultation will run until 31 May and you can have your say by using this link https://consult.defra.gov.uk/poultry-register/all-birds-registration2023/ which is also a link on reference 3.

1 https://www.gov.uk/government/publications/poultry-including-game-birds-registration-rules-and-forms

2 https://defra.maps.arcgis.com/apps/webappviewer/index.html?id=8cb1883eda5547c6b91b5d5e6aeba90d

3 https://www.gov.uk/government/news/consultation-launched-on-new-registration-rules-for-all-bird-keepers-in-great-britain

THE INDIAN RUNNER DUCK CLUB

There has never been a large number of people committed to breeding pure Runners to actually take up membership of the IRDC. As you can see from the records of Secretary Matthew Smith, there were only about 30 paid-up members in the 1930s. The Club did well to retain 25 post war. We do wonder how many people will remain members of breed clubs, or indeed keep their birds, in the current circumstances of avian influenza. With the lack of shows there is little demand for pure colour, show quality birds—in contrast to the demand for pets and hatching eggs.

Extract from 'The Indian Runner Duck – a Historical Guide'

During the 1930s, agreement had been reached on the true Runner type. Ashe Kings' criticisms had been (almost) finally silenced and a detailed Runner Standard accepted by the Poultry Club in 1930. Coutts was forced to give up his birds by 1930 and the Misses Davidson and Chisholm appear to have given up showing by 1932. James and Matthew Smith showed and judged, as did Hewetson, Fox-Brockbank, Appleyard and Anthony. Other stalwarts were Annand, Argo, Cree, Hewitt and Whitley, whilst Vernon Jackson started to show at the major events. Runner entries sometimes reached about one hundred but often fell to between 30 and 50.

Poultry World, Nov 21 1930: The Palace

INDIAN RUNNER DUCK CLUB SHOW. Judge: Miss Chisholm

FAWN (12): 1, 3spls, 2,3 Cree, a real grand team, little to choose, real Runners, fit; res, vhc, hc Smith. DUCK (10): 1,2 spls, Hewetson, nice duck, grand carriage, neat head, fit; 2,3,4,c Smith, another good duck, good head and carriage, fails wings; 3rd, nice colour, grand head, fails shape; res Hewitt; vhc Colmer; hc Hewetson. WHITE (15): 1 Annand, nice carriage, grand head and bill, wins easily; 2 Ives, neat body and head, shows bad; 3 Hewitt rare range body, good head, stands well; 4 Dawes, nice head, on small side; vhc Hewetson; hc Abbot. DUCK (14): 1 Argo, very fine drawn bird, perfect carriage, good head; 2,4 Annand neat body, nice head and eye, shown fit; 3 Hewetson, neat body, fair head, fails carriage; res Whitley; vhc Hewitt; hc Smith; c Cree. FAWN&WHITE (8): 1,2,3,spl, res Smith, 1st good body and reach, fine head and bloom; 2nd, close up, not as fit; 3rd similar; vhc Appleyard, hc,c Pollock. AOC (10): 1 Smith, grand shape and condition; 2, res Dodd, both good shape and reach, fails wings; res, vhc, hc, c Reeve. UTILITY (10): 1 Fox-Brockbank; 2 Marshall and Godsmark; 3 Hewetson; res Bell; vhc Haworth; hc Appleyard.

Indian Runner Duck Club.

LIST OF MEMBERS, 1930-1931

PRESIDENT

A. H. Fox-Brockbank, Croft, Kirksanton, Silecroft, Cumberland

VICE-PRESIDENT

~~Dr. J. A. Coutts ... 21, Cambridge Road, Southport~~

COMMITTEE

Mr. J. T. Dodd ... Riccarton, Newcastleton, N.B.
Mr. E. H. Lang ... Dumgoyne Cottage, Dumgoyne by Glasgow
Miss Chisholm ... Maisonette, Mount Cochon, Jersey, C.I.

Mr. T. Smalley ... The Lilies, 124 Beckenham Road, Beckenham life
Mr. C. O'S. Cree ... Moignes Court, Owermoigne, Dorset
Miss. E. Davidson, Maisonette, Mount Cochon, Jersey, C.I.
Mr. J. P. Dalgleish, Brankston Grange, Bogside, Alloa.
Mr. H. Jackson, Junr., Clayton-le-Dale, Blackburn, Lancs. life
Mr. F. I. S. Chatterton, Artist, Elmpark Road, Finchley, N.3
Mr. J. R. Smith ... Netherholme, Dumfries
Rev. J. Hewetson ... Burbage Vicarage, Buxton
Mr. H. Whitley, ... Primley, Paignton, S. Devon
Mr. T. French ... Doonpark, Dalbeattie
Mrs. Dunlop ... Carcant, Newham, Gloucester
Mr. D. Dunlop ... Carcant, Newham, Gloucester
Mr. J. Hewitt ... Woodbine, Littlethorpe, Ripon
Mr. A. Slater ... The Old Vicarage, Lythe, Whitby
Mr. I. A. Lewington Forrest Farm, Milkoham, Wilts.
Mr. C. Campbell ... The Willows, Haxby, York
Mr. Glant Fiske ... Harwood Hall, Corbets Tey, Upminster
Mr. G. Frost ... Crooklands Farm, Leighford, Stafford
Mr. F. I. Heme Iryk Old Mill House, Partridge Green, Horsham X
Mr. H. C. Wilson ... Ballydugenan House, Toomebridge, Co. Ulster

Mr. D. Thomas ... Esgereiron, Llanybyther, Cardiganshire
Mr. F. Argo ... Bructor Farm, Inverurie, N.B.
Mr. M. Smith ... Halmyre Terregles, Dumfries
Mr. R. Appleyard ... Ixworth, Bury St. Edmunds, Suffolk
Mr. H. S. Godsmark, Redlands P.F., Brede, Sussex
Mr. McL. Marshall, Redlands P.F., Brede, Sussex

Indian Runner Duck Club.

LIST OF MEMBERS, 1949

George Brumby .. 77 Lloyd Street, Cannock, Staffs.
Ronald Moore .. Langley Hill Farm, Middleton, Manchester
C. O's Cree .. Owermoigne, Dorchester.
Michael Gillow .. Parkdale, Bowdon, Cheshire.
Vernon Jackson .. The Mansion, Ford, Salop
Matthew Smith .. Halmyre, Terregles, Dumfries
Reginald Appleyard Ixworth, Bury St. Edmunds
J. W. Robinson .. 35 Oxford Street, Belfast
J. Watson Heslop .. Mosspetral, Greenhead, Carlisle
A. R. Dungey .. The Pathway, Nash Grove, Wokingham
F. Argo, senr. .. North Flobbets, St. Katherines, Aberdeen
H. Argo .. .. North Flobbets, St. Katherines, Aberdeen
Lance Evans .. Allshine Farm, East Anstey, Tiverton
J. T. Dodd .. Riccarton, Newcastleton
Hough Watson .. Braystones House, Beckermet, Cumberland
—. —. Mitchell .. Farnham Royal, Bucks.
J. R. Smith .. Merryvale, St. Lawrence, Jersey
H. W. Biddlecombe Prestberries, Hartpury, Glos.
Albert Waters .. Holbeach Bank, Spalding retired
~~The Lady Ailwyn~~ ~~Stone Lodge, Ipswich~~
Dan. Drewery .. Mount Pleasant Duck Farm, Gedney Dyke, Spalding, Lincs.

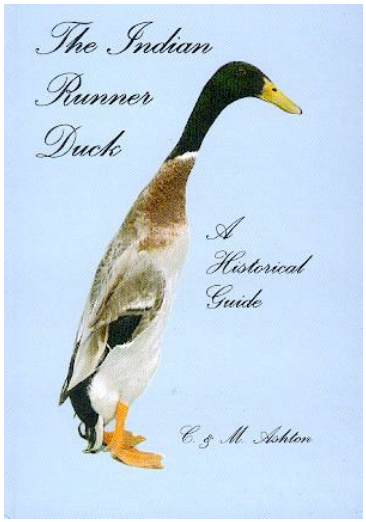
Mr. W. Woodmas Howard House, Gilsland, Carlisle
J. B. Newton Lewis Baythorne Grove, Baythorne End, Halstead, Essex.

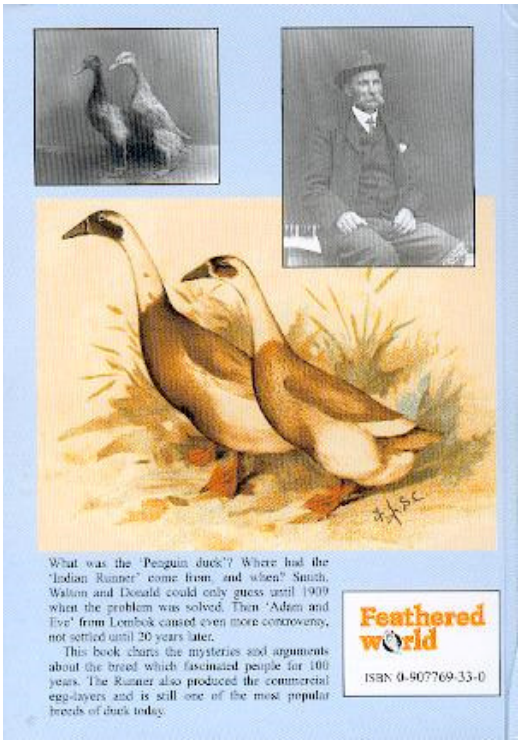
A. Lewington Cold Hayes Farm, Brockenhurst, Hants.

A few people managed to exhibit their birds throughout the 1930 –1949 time span. They included Matthew Smith, his son J R Smith, Reginald Appleyard, C O 's Cree, and F Argo. As you can see from their addresses, they travelled vast distances to exhibit their birds in London at the Crystal Palace and Olympia.

How that was achieved with Runners is almost unbelievable. Birds were sent by rail, in wicker hampers, sometimes lined with cloth. Food and water containers were within the hamper. Livestock were the responsibility of the railway staff *en route*, and the hampers were collected by the show organisers. The practice of transport by rail was eventually curtailed, with the advent of better road transport - and doubtless the Beeching railways cuts of the 1960s. Show schedules even into the 1980s often stated 'no railed stock' which was rather enigmatic to those who had not used the rail transport system.

The IRDC archive was retained by Matthew Smith's daughter-in-law , Mary Smith, who kindly passed on the material to Chris Ashton for the IRDC in 2001. Much of the material was included in 'The Indian Runner Duck—a Historical Guide'.





INCUBATORS

Over the years, I've had MS, Curfew and Brinsea incubators. I still use the Brinsea Polyhatch and Hatchmaster— and broody birds! Brinseas are well made – and the company still sells spare parts for its older models. It's a very good service.

Interhatch at Chesterfield advertises Brinsea, along with Fiem.
The Incubator Shop at Beverly (West Yorks.) also stocks an amazing variety including Brinsea and Fiem, plus Rcom which seemed very popular a few years ago.
If you are choosing an incubator on the internet, the Brinsea page is very useful for deciding on the right model for you.

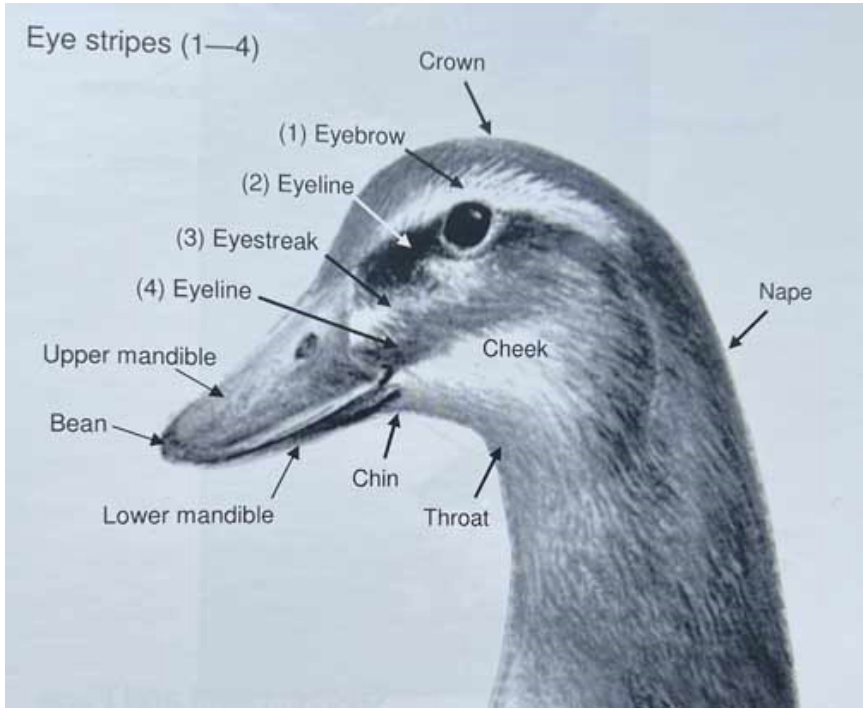
https://brinsea.co.uk/latest/product_advisor/choosing-an-incubator/

" Selecting the right incubator, brooder and accessories for your particular needs can be a challenge. You need to consider the number of eggs you want to incubate, whether you want to turn your eggs by hand or have automatic turning and so on – but whatever your level of experience Brinsea have the incubator for you! We have produced a product comparison chart to assist you in choosing the ideal selection of products for you and your birds. "

https://brinsea.co.uk/latest/resource-centre/egg-sizes/

Thank you Antonia Hudson for continuing to host the IRDC website

Indian Runner Duck Club | Welcome
https://www.runnerduck.net/



Mallard (M+) face markings are collectively referred to as 'eye stripes '. The paler markings (including the cheek and the throat) are emphasised by 'Appleyard grizzle' (page 16).
The darker eyelines show up in infant fluff.

WHAT HAPPENED TO OUR TROUTS?

Trout Indian Runners used to be the most reliable colour – there were very few complete rejects and, although the birds were rather small, they were of a beautiful type.

Something happened though, in the late 1990s. The Trouts got a lot taller, and that's where the colour problems began. Birds brought back from Germany (where the Trout standard colour originated) began to acquire grey/white flecking in the green hood of the males. That was something which crept in, so we were almost unaware of it at the time. Often it did not show up until December, almost looking like an early male eclipse stage. Not so. Left unselected, the grizzle became more and more marked. And if it was selected for – then it could actually become the enhanced 'Appleyard eye stripe'.

It was much more difficult to see the problem in the females. Only by being aware that there actually was a problem could the correctly marked females be identified, and that was tall order because the fault had arrived by stealth. This is a recessive feature which creeps in almost unnoticed.

Since the 1990s, 'Appleyard Runners' have even been selected from the faulty 'Trout' stock. These 'Appleyards' are usually very tall, strong birds and there is no doubt that the colour has 'arrived' because the type (in mallard restricted (MR/MR) rather than mallard (M+/M+) is eye catching. I'm also sure it will stay because of Runner colours being continually mixed up in groups of mixed colour birds which supply 'Indian Runner hatching eggs'.

Although probably originating from German stock, the 'Appleyard' infiltration has also migrated into the USA. And there are now signs that, in Australia, the dreaded 'Appleyard grizzle' is contaminating their bantam duck and exhibition mallard populations too.

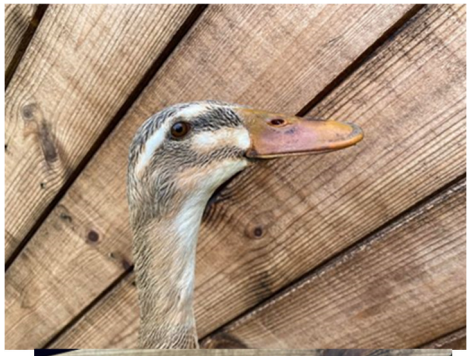
What am I looking for to stay clear of this problem?
In the males, it's essential to choose drakes which have a clear hood of coloured feathers, which stays free of grizzle until April in the breeding season. That means running on a group of males until the best can be selected for

breeding, sometimes at nearly a year old. That's an expensive and long-term business.

These observations on grizzle apply to normal Trout (bl/bl), Blue Trout (Bl/bl) and Apricot Trout (Bl/Bl) birds. In the duckling photo by James Rigby, there is one of each colour type. All three are 4-spot mallard (M+/ M+) and light phase (li/li).

Head colour faults in mature Apricot Trout Indian Runners

This Apricot Trout male is homozygous for the blue gene. The UK standard for exhibition stipulates that the head should be pigeon blue. This bird is correct.



The white in the head colour (grizzling) of this male is a common major defect which should be avoided. The dilemma for the breeder and exhibitor is that these grizzled birds often have a better 'Runner' head, and are also tall, eye-catching birds. Unfortunately, they should not be selected as Trouts.

The grizzle fault shows up much more clearly in not-blue birds – this green-headed male (left) shows up the fault much earlier than the Apricot.

So, what do the females with the Appleyard grizzle gene look like?

Breeding from males with the grizzle fault can produce females with white/pale eye stripes, and a white throat.

In contrast, the ideal Trout female eye stripes (left) should be coloured, not nearly white. Note that this female also has a coloured rather than a white throat. There is a pale fawn ground colour. The breast should also be coloured, not split by paler feathers (***the five photos are by James Rigby).***

This group of Juveniles show the problem. Produced from Trouts ([bl/bl] green head crossed with Apricot Trout [Bl/Bl])) the resultant Bl/bl mixture shows birds with pale eye stripes and throat, as well as birds with coloured eye stripes. The Apricot parent birds are more likely to carry and pass on the fault because it's harder to see the pale stripes in the paler plumage. These Apricot 'Appleyard' types were well established in the German stock in the early 2000s.

The same problem also afflicts the USA and Canada stock where only determined selection of birds pure for colour will resolve the problem. Maria McDonald's group of almost uniform Trouts (page 18) has been selected over several generations from commercial colour crosses. As you can see, the green hood in the drakes is good at this stage of selection, and they have the typical light phase V of green at the back of the neck (rather than the broader Mallard green stop). In contrast with Trout and Mallard, a completely white neck ring is evidence of a cross with harlequin phase. That sometimes crops up in the show pen when such drakes (li/lih) also reveal faulty colour by light spotting on the flights.

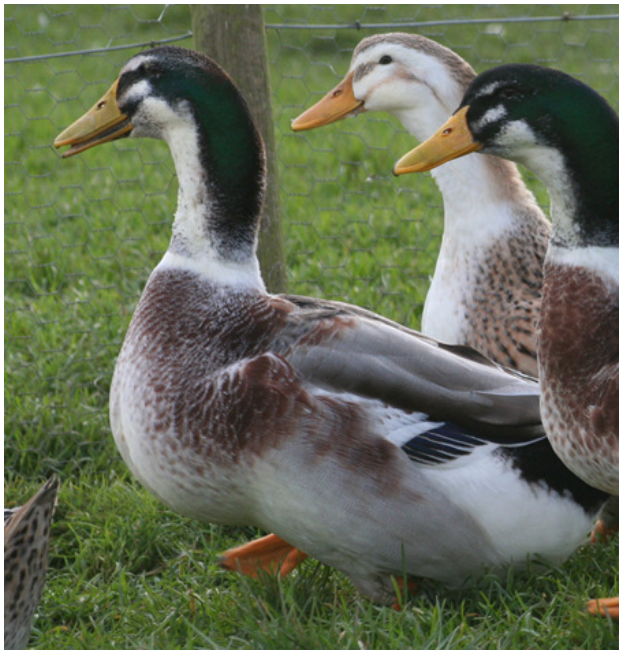
Maria's females still show slight variability in eye stripes and throat colour. But, getting this far from the original mixed colour birds has only been achieved by her careful selection of ducklings in the fluff, over several generations, as well as from birds in nuptial plumage.

WHERE DID THE APPLEYARD GRIZZLE COME FROM?

The Mallard restricted pattern (MR) is known to hide beneath the white plumage of Pekin ducks, which were used by Jaap in the 1930s in his analyses of mallard plumage. The striking, light face markings often accompany MR, and Reginald Appleyard in the UK probably used Pekin crosses to create his table duck, the large Silver Appleyard (hence the breed's name). Unfortunately, the face markings need not travel as a package with mallard restricted; they can be separated from MR, hence the problem.

Does it matter? Well, for the average duck person, then probably not. But the mixing up of the colours does result in rather non-descript brown ducks rather than the beautiful pure colours and breeds. Also, the grizzle does contaminate other colours such as the UK Silver (harlequin) Runner as well.

As an illustration of what happens from mixtures, commercial ducks from China show the variety of genes hiding there – from coloured to pale eye stripes; to hoods or not hoods; and to a reduction in body colour (MR) or overall body colour retained (M+). These are the colours and patterns which, when selected, make up the pure colours of the Rouen Clair, and the large Appleyard (see page 20).



An exhibition Large Silver Appleyard of Graham Hicks illustrating the face markings. The dominance of Mallard Restricted colour makes it hard to establish the genotype by a visual inspection . This bird is thought to be (MR/MR) (li/li) because of the 'split chest' from MR and also the white bar of the coverts overlying the speculum—but only test breeding and examination of ducklings in the fluff could prove it.

What has become clear is that the ad lib mixing of duck colours over the last 30 years, especially at commercial hatcheries, and by egg vendors, has created such a genetic mixture that it is very difficult to get back to a standard, pure colour. That is especially true of both Runners and Calls ducks where people recognise the type, but not the pure colours, and so continually mix them up

And it's not just the mixing up of the main colours which is a problem. The genes of major significance – the patterns MR/M+/md and phases Li/li/lih - can be accompanied by modifier genes which affect their expression. It's not simply a matter of sorting MR from M+ and md; and Li from li and lih. In addition to the genes of major significance, there are independent patterns such as pale eye stripes and throat (associated with Appleyard grizzle) versus mallard ground colour stripes; dark hoods perhaps associated with md; and coloured versus white smaller wing coverts (for example). Add to that the colour intensifiers now known… and there is a lot more variability in ducks that we first thought.

Contributors: Chris Ashton; James Rigby and Maria McDonald.

More info on Trouts at https://www.ashtonwaterfowl.net/pdfs/FF_The_year_of_the_Trout_Indian_Runner_2013.pdf

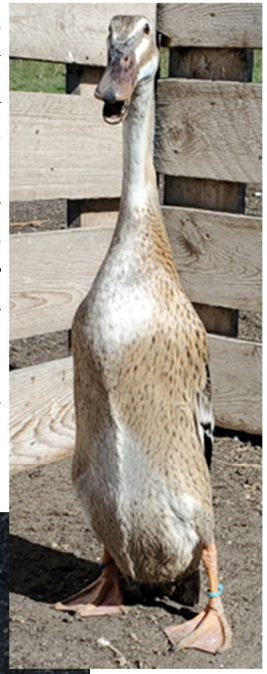
Commercial weeder ducks in rice paddy, China
https://www.foodandlandusecoalition.org/ducks-to-the-rescue/

CORRESPONDENCE WITH MARIA MCDONALD : "SO WHAT DO THE FEMALES WITH THE APPLEYARD GRIZZLE GENE LOOK LIKE?"

Starting to make pure colours of Runners in Canada has proved to be quite a mind game for Maria McDonald. In the UK and Europe we have had access to pure lines of birds because breeders have exhibited their stock and discussed the birds at exhibitions for many years. Not only that, German breeders—who are source of several pure colours—are very selective about the colours they exhibit. That may not be the case where distances in North America (and Australia) are huge. Birds and eggs are frequently bought at local commercial hatcheries where hatchability is uppermost in the mind.

Maria's experience has thus been one of unravelling the mixtures of colours, by using F M Lancaster's nomenclature of duck colour genetics, and also reliably recording parentage and offspring. Thus, she has been looking at all kinds of mixtures from the outset, and then unravelling the segregants emerging from the colour crosses.

Maria says: You only mention the head, which is where I looked at first, but I didn't actually make any progress until I combined watching the head with the other areas of the body. One trait I found to be a clear giveaway for grizzle trouble is too much white in the neck, chest, and belly. So, avoid keeping ducklings with extended yellow areas in the down, as well as juveniles with any white on the throat or chest. Here is a picture of what I mean in the juvenile.



This duck was a 2020 hatch and about 5 months old at the time.

The other trait is the one you and James Rigby showed me, which is the feather pattern on the back. This same duck had a back that looked like this.

Those were the 3 key areas in the females that led me to better Trouts. I can definitely see where there is still much more im-

Chris: I think the problem you were dealing with in the mixed stock available at the time was at least two-fold. There were light eye stripes and throat from 'Appleyard' grizzle, plus harlequin phase (lih) interfering with the feather pattern.

Trouts (li/li) crossed with silver (lih/lih)) retain light peppering along the leading edge of the primaries which shows on the female in the hand (page 21). This peppering does not necessarily disappear when a li/lih bird is bred back to li/li again to obtain (li/li). Some imperfections still seem to remain. They are the details which exhibitors pick upon when examining birds closely at shows. Judges will only see these details by handling the birds – and also knowing what to look for.

Harlequin also lightens the under belly [as does MR]. It also interferes with the delicate streaking of the feathers – the lower flank feathers become peppery rather than streaked, and the back becomes mossy in some (li/lih) birds or marked with triangles where the streak along the shaft is interfered with by a concentric dark mark. These harlequin giveaway marks show up on the back of the McDonald bird—suggesting an lih cross at some point.

It is amazing how Maria has managed to extract pure colours from the original mixtures. Please take a look at her Runner colours on her website to see how she has segregated them out.

Harlequin markings, in this case on an (lih/lih) bird. They can be more exaggerated than this—or even disappear over the year. Typical of harlequins!

Much of this information is also freely shared on the Facebook page ***Duck Colour Genetics*** run from Australia by Ross Rollman and Rachel Eggins.

Welcome to Dusky Feathers Waterfowl, located in Manitoba, Canada.

We've been keeping ducks for a number of years now, focusing on restoring and preserving heritage breeds, with a parallel interest in the science of color genetics and discovering more about the complexities that create all the different phenotypes we are so familiar with.

And this is me…Maria McDonald, the person whose brain is like a dog with a bone…so I gave it something inconsequential to chew on when the insanities of the world become too overwhelming…duck genetics! (there's always good meat on that bone!)

I love record keeping and data and thousands of pictures. I love Punnett squares and predicting outcomes and calculating the path to a new color (or the path to clean up an old color!) AND I love ducks…their funny quirky manners, their love of routine and predictable behavior, their incredibly cute babies, and the amazing magic that happens every time you put an egg into an incubator!

https://www.duskyfeatherswaterfowl.com/

FERMENTING WHOLE GRAIN WHEAT

We've always fed whole wheat grains under water for both ducks and geese because this prevents fouling by most wild birds. That's especially important for biosecurity and reducing transmission of avian influenza. However, with correct fermentation technique, one can further enhance the flavour and digestibility of the grain. That's also a good strategy now that feed prices have increased so much.

Drying feeds to low moisture content improves their storage time but reduces their food value. Reconstituting them by fermentation improves food value and is like producing the best yogurt or sauerkraut for your birds!

Lactobacilli are present in the air and on the surfaces of the grains and will proliferate in the right environment. L. acidophilus ferments sugars into lactic acid and grows readily at rather low pH values (below pH 5.0). It occurs naturally in the animal gastrointestinal tract and mouth and some strains of L. acidophilus may be considered to have probiotic characteristics. On the first day of soaking, digestibility is initially improved by the reduction of the phytic acid and enzyme inhibitors found in dried grain. By the second day, the Lactobacilli begin the process of fermentation by using the sugars in the grains and multiplying in great numbers, producing lactic acid. The lactic acid makes the environment unsuitable for harmful bacteria, as long as the wheat is totally submerged in this acid, anaerobic environment.

Feeding

Our geese and ducks are fed two-day fermented, strained wheat decanted into buckets of fresh water, just sufficient ration for the day. The strained wheat grains can also be mixed with dry grower pellets for the ducklings. That ration should be consumed straight away and not be left out in the air to go mouldy or attract wild birds. Note that moulds are especially toxic for waterfowl.

All birds also have access to coarse builders sand (sharp sand), or mixed poultry grit if in-lay.

Academic studies have found that fermented feed for poultry has increased egg weight, shell weight and shell thickness, and has improved intestinal health by forming a natural barrier to acid-sensitive pathogens E. coli, Campylobacter and Salmonella. Fermentation reduces the level of anti-nutrients found in the grains and seeds, and improves the availability of vitamins (folic acid, riboflavin, niacin, thiamine) during digestion. It takes a bit more organisation but is well worth doing because increased nutritional absorption also leads to reduced food intake.

Successful fermenting

- Use a glass container for small amounts, or a food-grade plastic (BPA - free) container for larger amounts. The lactic acid released increases the chance of leaching of bisphenol into the liquid.
- Well or spring water to completely cover the wheat is recommended, but I find that our tap water is fine. If it is high in chlorine, then leave the bucket of water to de-chlorinate by sitting for 24 hours, and then add the wheat. Chlorine will inhibit bacterial action.
- Stir the wheat to release gas bubbles. Top up with water to keep a depth of 5 cm plus above the grains.
- Store in the dark; sunlight must be avoided. Use a loose-fitting lid so gas can be released.
- The grains have improved by 24 hours but digestibility is further increased by day 2–3. The grains and liquid should smell like sour-dough bread.
- The process takes 3 or even 4 days in winter when UK temperatures are low, but in summer, a 2-day period is sufficient.

Grains at days 1, 2, and 3. By day three, in cool conditions, the grains are much softer. Two days are enough if the weather is hot.

Fermented feed for laying hens: effects on egg production, egg quality, plumage condition and composition and activity of the intestinal microflora.

Engberg RM1, Hammershøj M, Johansen NF, Abousekken MS, Steenfeldt S, Jensen BB.

Summary: An experiment with a total of 480 hens was carried out from 16 to 38 weeks of age to evaluate the suitability of wet fermented feed for layers, taking aspects of nutrition and gastrointestinal health into consideration.

Fermented feed was characterised by a high concentration of lactic acid and a moderate level of acetic acid, high numbers of lactic acid bacteria and a pH of approximately 4.5. Feed fermentation reduced the concentration of dietary sugar from 32.1 to 7.3 g/kg DM and the phytate bound phosphorus from 2.7 to 1.9 g/kg DM.

Fermented feed seemed to lose attractiveness for the birds quite rapidly, resulting in a more aggressive behaviour and a poorer plumage condition than in birds given dry feed. The use of fermented feed reduced the litter DM (dry matter) content.

During the experimental period, the body weight gain of hens receiving fermented feed was 80 g higher than of hens fed the dry mash. Presumably because of an extended adaptation time to the feed, the onset of lay occurred later when hens were fed on fermented feed, resulting in non-significantly reduced total egg production.

Throughout the experimental period, the feed DM intake of hens fed with fermented feed was lower than that of hens receiving the dry mash (110 vs. 125 g). From week 26 to 37, fermented feed improved the feed conversion as compared with the dry mash.

The use of fermented feed increased egg weight in the period from 34 to 37 weeks (61.4 vs. 60.0) and increased shell weight and shell stiffness.

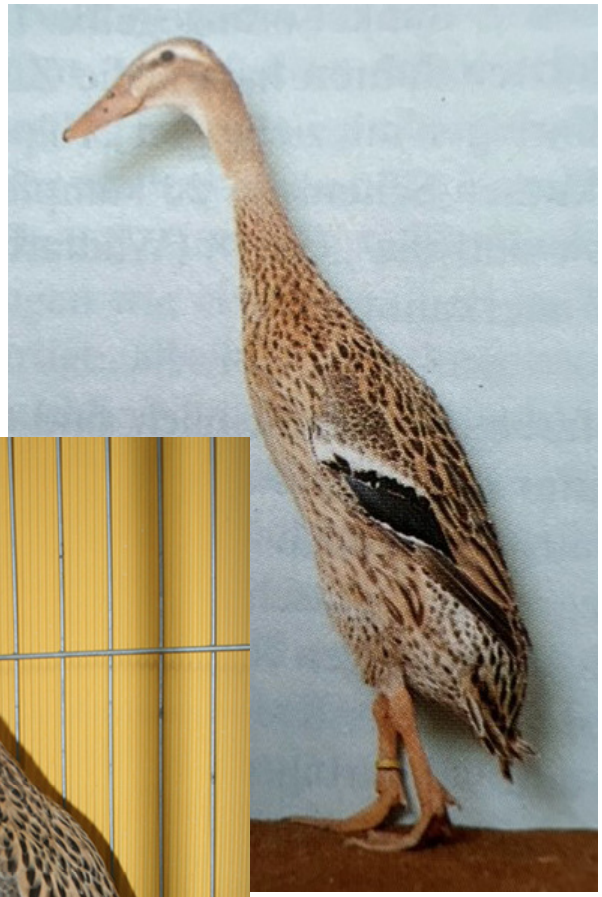
The feeding of fermented feed increased intestinal health by acidification of the upper digestive tract, forming a natural barrier towards infection with acid sensitive pathogens, e.g. E. coli, Salmonella and Campylobacter.

It was concluded that fermented wet feed offers potential benefits for health and nutrition, but may become suitable for layers only after the practical problems related to this feeding form have been overcome. However, an early adaptation of the birds during the rearing period seems to be necessary.

http://www.ncbi.nlm.nih.gov/pubmed/19373724 (original paper)

Br Poult Sci. 2009 Mar;50(2):228-39

Right: A Trout female illustrated in Horst Schmidt, 1989. The ground colour of her paler eye stripes is pale fawn, and she does not have a light-coloured chest.



Left: Trout female at Hannover 2009 showing lighter eye stripes than the 1989 bird, but the lower flank markings are still streaked rather than fuzzy.

Above: Rouen Clair imported from Germany, 2003. Same plumage colour as the Trout (light phase mallard). The eye stripes and throat are coloured, not cream-white.

Trout duck chosen for The Poultry Club Standard, 2018 edition:
Clearly defined pencilling on all the body feathers; bill pinkish orange brown (as females were in the 1980s); coloured eye stripes and throat.