Intense (B), (+) dilution (d) milky (my).

The **Pigeon Genetics** Newsletter

News , Views , & Comments

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Section #1 Beginners .

A Modifying mutation that sometimes is mistaken for dilution is " **Milky factor "**, symbol (my) . It causes the entire bird to look like it has been washed over with a soft milky colouration . Another term for the same trait is "Powdered".

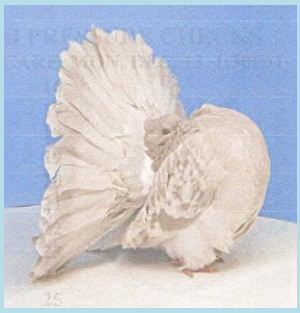
The milky gene is recessive to wild colour and it is "autosomal" (not sex-linked). Both parents must be milky ., or one may be while the other carries the trait hidden ., or both may carry the trait hidden in order to produce milky factor young in either gender . Sometimes the wing Patterns are just softer base

Vol. 4 page 2. colour , or they may appear pinkish or tan in colour and this is due to the presence of bronze (The photos above: Wild type Intense, Gary Keith., the dilute is from Facebook group post , milky is by Dany Doneks and the collage is of a bird from John Vance done by Jith Peter). Intense milky young are hatched with long down hair , while the dilute phase birds are hatched either very short down or naked. Milky birds will usually have dark beaks and toenails in the dark pigments unless pied is also involved . Milky combined with Spread factor on blue series T-pattern along with pied produces the lovely "Lavender" colour seen below.

Pair of True Lavenders - Sazzad Hassain

Dilute Dirty factor blue Lahore (Silver) ., Facebook post by "Royal Khan" ., for comparison .

Volume 4 page 3 , We do not hear about "milky" factor a great deal in pigeon conversations unless we are discussing the beautiful "Lavender " Lahores ., or the "Powdered" Fantails which gained considerable popularity starting back when I was quite young.



A milky brown check & powdered blue bar bred by Andrew Kerns, Wildbriar Lofts . (previous PGNV&C) & Fb.

Ice factor sometimes is mistaken for milky / powdered , but indeed there can be milky Ice factor birds . Powdered Show type Racers may have been developed from a separate (milky look-alike) trait that may also have stemmed from the Ice trait . With these there is no softening of the main Coarse and smooth spread pattern areas .

Unimproved Ice Gola , and Damascenes Lightened Ice Racer (Ts) Ice Pigeon .

Milky and <u>smoky</u> can create a soft blue gray that is darker than Lavender (center photo below) . The terminal tail band and wing patterns are lighter and this can make for a rather striking phenotype in Fantails .

Milky, smoky Opal Blue T-Pattern by - Anwarul Kabir

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Rakin Habib (milky Ice)

Abdul Wahab (milky Grizzle)?

Birds that have kite bronze present with soft tan patterns on Powdered silver can be very attractive . The one below may have Ts1 of the Toy Stencil complex which may account for the Bull eye , or just because of the pied pure white rump.

Indian fantail by "Nur Pigeon " Facebook Post .

Section #2 Intermediates :

We now know that there is a phenotypical **look-alike** for just about every known trait we see in pigeons today. You may hear these referred to as "**mimics**" . Most if not all of our look-alike traits are manmade, have simply happened without any natural selection for any specific reason , thus they are just similar in appearance to something else and not actually mimics of anything .

Mimics on the other hand , have evolved over long periods of time involving natural selection specifically due to their direct relationship with the very survival of a given species. Mimics may occur to attract a mate to ensure fertilization of eggs ., or they may develop as part of a means to avoid predators. So the point being made is that just because it appears to be a look-alike , does not categorize it as a genetic mimic of another trait .

Volume 4 page5, Studies have been done with regards to the patterns and other markings on pigeons and it is possible that the dark chequered patterns and Dirty modifiers have been perpetuated partly due to the environment of rock ledges and later asphalt roves and paved streets . The Rump patch may have evolved because it attracts mates and distracts predators much in the same way stripes or patches do on the Zebra and Giraffe .

Here is a true "mimic" trait whereby a Moth has evolved to "act like" a broken off tree branch.

Milky spread blue/black and bronze Khaal Guldaar.

Volume 4 page 6 . To get the best expressions in milky factor , it is probably best to avoid all darkeners . Individual patches of different colours , affected by the overall milky trait such as is seen on the above Khaal Golas , gives us a wonderful display. We can see each colour (black , and Bronze) clearly affected by the milky modifier.

Milky looks nice on a **stronger** base colour. Washed out colours and mixed / grizzled colours do not lend themselves well to the milky trait because there is not enough colour there to begin with to show the powdered effect .

Section #3 Advanced :

The milky gene should be serving us much more significantly if we begin to appreciate its unique feature and select to eliminate all of the traits that interfere with its expression. Below "Golden Dun " Milky ? dilute Brander Bronze.

Iffi Sonu photo.

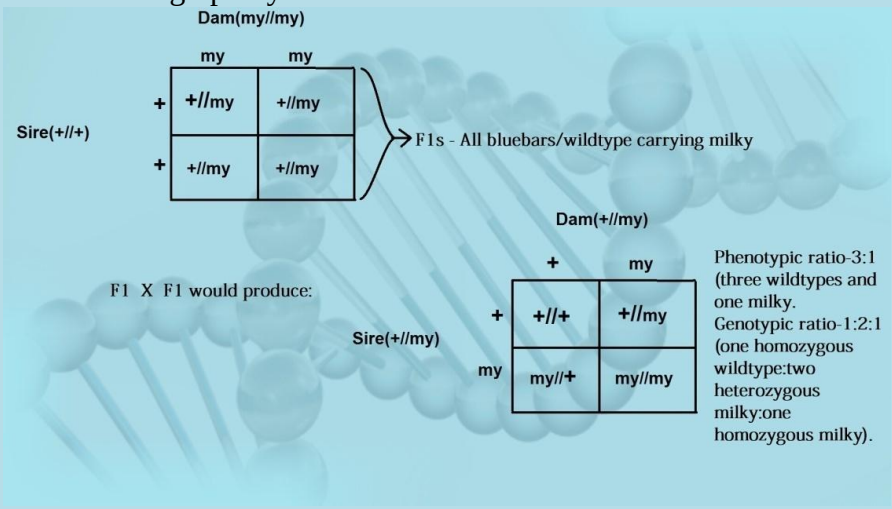
Milky factor Ice factor Blue Bars , Aiagopa Ttepiotepia

Vol. 4 page 7 . There are a number of graphic methods that we can use to determine what we will get from any given pair . Firstly we must consider each individual trait separately . Secondly we must already know which traits are sex-linked (located on the sex chromosomes) , or autosomal (not on the sex chromosomes) ., and whether they are dominant ., partial dominant or recessive to wild-type Blue Bar . Once we understand that , we can begin with a Punnet Square as you see below. You can place the genotype of sire on the left side of the table , in this case the sire has the wild type allele(+) in the milky locus on the homologous chromosomes. Then at the top we place the genotype of the female parent, in this case the dam is a homozygous milky (my) . Note: we are not considering anything here except the milky trait, which is an autosomal recessive trait. In the four squares you then place each of four possible combinations for the offspring. In this case all f1 will appear as wild type (Blue Bars) , that each carry the milky gene hidden.

The f1 youngsters mated together will give you the ratios shown in the second punnet square.

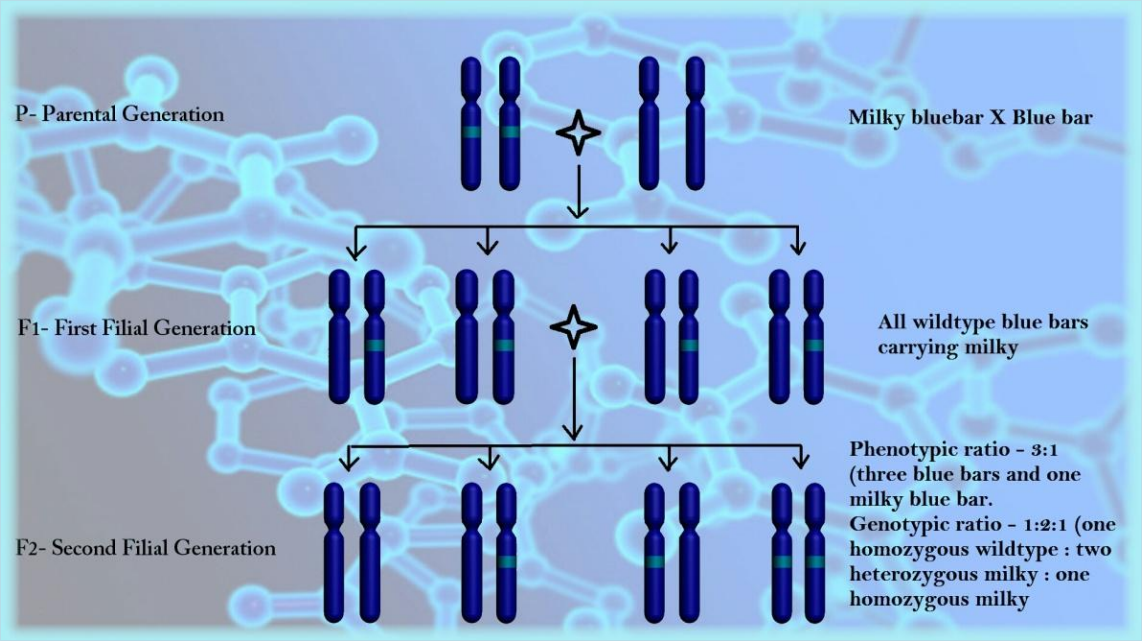
The charts below by Jith Peter .

Milky is an autosomal recessive mutation, so a bird must be pure for milky factor in order to express the mutation. Mating a milky bird to a wild type produces only wild type birds (unless the wild type parent carries milky), and all the f1 will carry milky. Mating two f1s (milky carriers) will produce 25 % birds pure for milky which express as milky, 50% offspring will be heterozygous for the mutation and 25% will be free from the mutation. You can see that in the diagrams given below. Paragraph by Jith Peter.



The punnet square is probably the most commonly used method for monohybrid crosses. A monohybrid cross is a mating between individuals that have different alleles at one genetic locus of interest. It is quick and easy to sketch and then to fill in the appropriate symbols . Start with the very basic Colour traits , and see how it works , then try some of the more rare traits , while remembering that you must ignore such things as the fact that they may be pieds or some other combined modifier traits.

Volume 4 page 8 . Calculation using the Chromosome diagram : Here we follow the same procedure except we use a matching pair of chromosomes for each parent, coloured or otherwise marked to show that the male is pure for milky and the female is pure for wild type . Then the filial generation of the four possibilities that in this case will all be the same genetically. If we mate two of these together we can see by the f2 generation that we again have the same phenotypic & genotypic ratios as seen above in the punnet square method . No matter which trait you are considering ., it is best to take it as an individual trait and compare it against another individual trait making certain that you firstly know which one is Dominant over the other., and whether they are sex-linked or not.



For your records you can make any kind of similar drawings to denote the two chromosomes of the Male parent ., and the two matching chromosomes for the female parent.

Sex-linked traits cannot be carried hidden by the female , so they are charted as showing the hen with only one Chromosome for the trait and a somewhat smaller second sex chromosome that otherwise contributes no colour modifiers .

More will be done on that in a Newsletter featuring the chromosomes and DNA.

Vol. 4 page 9. Below : Intense Black , Milky Black - Intense brown /Chocolate , and milky brown . This photo is designed to demonstrate the phenotypic difference that you may see involving Intense spread and milky Blue & brown series birds . The black is affected by the autosomal Dominant modifier (SPREAD), the Lavender is also a spread blue bird which is also milky factor. The Chocolate is a spread Intense Brown series bird , and the fourth photo is a Chocolate affected by the milky gene. Photos from Mick Bassett .

Below : The first two birds are Ash-red T-pattern that are affected by the "dilution" gene , the third and fourth birds are also ash-red T - pattern but with the milky factor from Nilesh Rajput and the last bird is an Intense phase Ash-red T-pattern which also is expressing a strong "bronze" trait from Mohammad shoaib.

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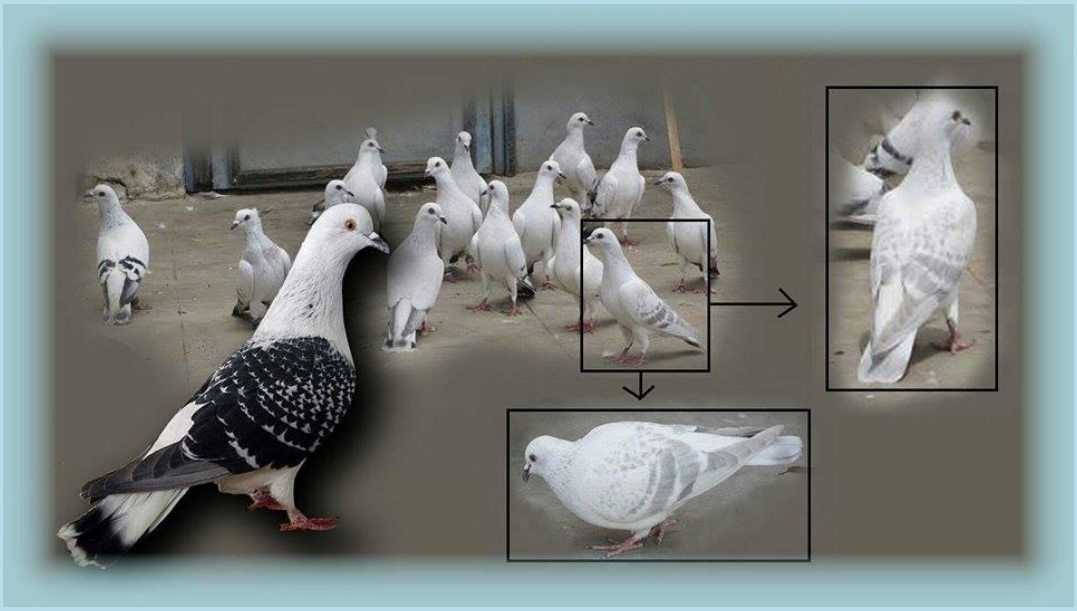
Milky dilute ash-red T-pattern bronze and dilute Ash-red T-pattern bronze –From Mohammad shoaib & Nilesh Rajput.

Below : Ice factor blue checker and Ice milky factor checker . Ice factor affects the areas of the bird where we find the pigment granules in a "clumped" arrangement. The milky gene affects the entire plumage so that the smooth and coarse spread areas of the tail band , wing flights , and wing patterns are softened from black to gray or tan tones. Ice breed from fb and the remaining birds are Hydrabad Neela from Mohammad shoaib



Vol.4 page 11. Below : Milky T-pattern Kite Lahore and two spread ash expressions showing that they are not true "Lavender", but rather a greyish ash red tone . The red lacing may or may not moult away with age from the bird on the right. There may be several different reasons why some birds have apparent laced edges to feathers while others of the same colour trait do not . In some cases it may be an optical illusion involving feather structure and light reflection. In other cases it may be residual base pigment which remains expressed as a result of additional modifiers such as a bronze factor and / or Sooty factor.

Photo of Lahore from Nilesh Rajput and the other two are from fb

Addition to last Month's article by Jith Peter .

In the report on Molecular Research of the U of U on dilution , which I explained last Issue , I have given the functional role of SLC45A2 Protein as a Cation exchanger. I would like make it a bit more clear!

The function of Slc45a2 has been proposed to be linked to the production of melanin in either of two different roles

1) The proper movement and sorting of tyrosinase to the melanosome (Graf et al., 2005)
2) the maintenance of a specific pH within the melanosomes themselves by working as a cation exchanger (Lucotte et al., 2010)

Studies in Zebra fish(2012) support the second postulation and based on that claim I explained SLC45A2 as a cation exchanger. However, The report of U of U and another report of molecular research on chickens published by another university says that the exact function of SLC45A2 is still unknown. Since the exact function of SLC45A2 is still subject of much controversy, I just wanted to especially mention this!

Lastly we have three lovely Standard Fantails : (1) a milky Brown series Checker. (2) An Ochre / Khaki Bar., and (3) A milky pure Indigo Blue bar? . Wildbriar Lofts Andrew Kerns Fantails .

Milky dilute Blue bar and dilute Blue bar from facebook.

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Milky spread blue T-pattern frill Stencil / Toy Stencil Complex by Wildbriar Lofts , and a spread blue T-pattern Frill Stencil / toy stencil full complex from Facebook Group.

In closing I want to thank Jith Peter of Palakkad India who put a great deal of time into creating the charts and arrangements of colour traits so that we can compare them closely .

The success of the Newsletters also depends upon input from YOU the subscribers . Everyone has been somewhat silent , opting to enjoy without taking part , so I hope that more will contribute photos ., ideas ., and comments in the near future.

The Next Issue will feature "smoky" factor . Then in June the Bronzes ., and then in July the Almond family .

Jith Peter is working with me as co-editor to bring you a top quality Newsletter with as much information about each Month's Topic as we can possibly provide.

Special thanks to all those who have consented to the use of their photos . In a few cases we took photos from files we made before we kept records of Owner/Breeders . We will try to ensure that all those whose photos we use will be given full credit in the future !

Until Next issue it is " so long" from the Pigeon Loft ~ Bob R.