The Role of Inbreeding in the Racing of Pigeons and the Foundation of Families

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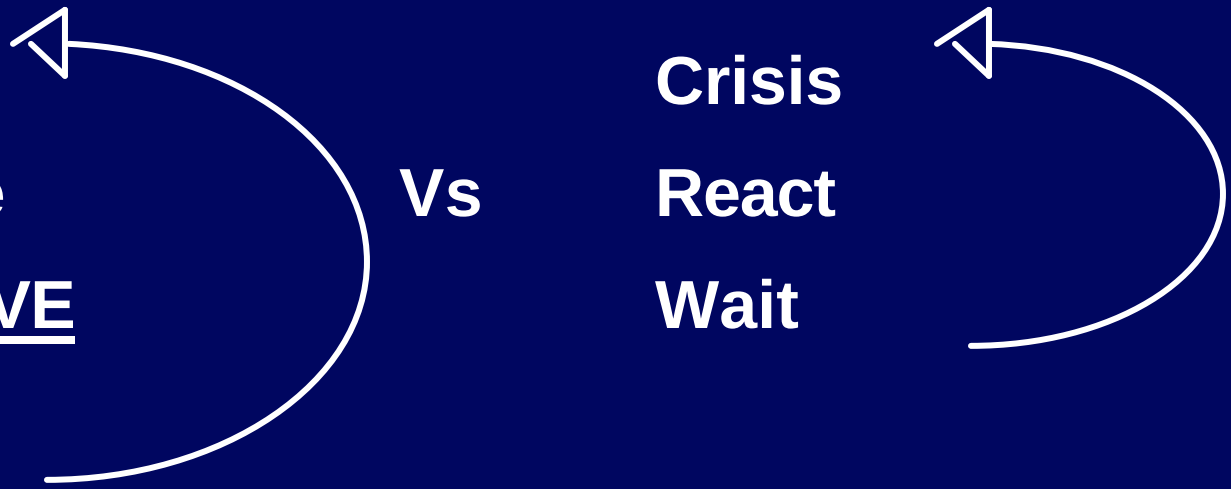
Agenda:

- Some Background Comments
- The Concept
- Ten Guiding Principles
- Examining Six Common Myths
- A Strategy for Most of Us

1) I am here to share what I have come to believe after 37 years of intense study and practice in the field of animal breeding.

2) I am not here to make converts. There is plenty of room in the sport for many approaches. Use what works best for you.

3) **There are no "silver bullets" in this business. Every successful approach takes a plan, patience, and hard work.**



4) Surely we will continue to improve our techniques, but remember that once a new technique is widely known, it stops being an advantage and becomes a requirement.

5) As sophisticated as racing is today, we may well be close to the point where we have maximized all the environmental factors. When this day comes, genetics will be the only area where one may forge an advantage. Even more importantly, I believe we are far from the point of having maximized the genetic factors

6) Much of the prejudice against inbreeding stems from misunderstandings about how it works and from the failure to realize that what is morally inappropriate for a human population doesn't really apply to the breeding of an animal population where we can cull.

So, what Is Inbreeding?

1) It is nothing more than the mating of related animals.

2) Linebreeding is a type of inbreeding where the related animals have a common ancestor. It is often used to try to “perpetuate” an animal that has died or perhaps that was too expensive to buy.

Why Would Someone Practice Inbreeding?

(+) Inbreeding increases the predictability of the matings by narrowing the gene pool.

This results in a higher percentage of offspring which meet selection criteria. In the case of racing pigeons it can mean a higher percentage of birds capable of a certain level of race performance. Instead of 1 in 1000, the rate might be reduced to 1 in 50.

There Are Downsides:

(--) Since variability is reduced, it can slow further improvement. For this reason, a successful inbreeding program will usually incorporate an outcrossing strategy to increase variability (in a positive direction of course) when uniformity has been achieved and further refinement or improvement is desired.

(--) Inbreeding decreases the positive effect of heterosis (hybrid vigor). This effect is rather easily and dramatically managed by the use of a crossbreeding program for the production of the racers.

The concept for the use of inbreeding in racing pigeons is to use two inbred, but unrelated, lines which cross well and to use these crossbred birds for the race team. By careful construction of the inbred lines, the resulting crossbreds can be uniformly outstanding. Further, the crossbreds benefit from 100% heterosis which can give them a significant advantage.

To put it another way, having a “golden couple” is very nice, but wouldn’t it be even better to have a “golden pair of lines”?

1) The laws of genetics apply to all species with amazing consistency. Learn them and use them to your advantage. The pigeon is not an exception. Don't waste valuable time rediscovering known science.

2) Genetic change occurs in the time frame of generations. This requires that your breeding program be focused for a prolonged period (years!) on a consistent set of goals.

3) Body, attitude, fitness, fuel, and luck collectively contribute to winning a race. All but luck are influenced by both genetics and environment. Genes determine the maximum potential of the bird, while the environment determines how much of that potential is actually realized.

With respect to selecting genetically superior animals it is critical that the environmental factors be equalized, so that observed differences in performance are in fact due to a genetic difference. Use contemporary group testing whenever possible. The new computerized traps are a fantastic new advance that will greatly aid in this regard.

4) Inbreeding increases predictability by narrowing the gene pool. (This also means that it decreases the variability that will be seen in the offspring and can actually set limits on progress that can be made). A true master breeder is never satisfied with such limits and uses both inbreeding and outcrossing to achieve consistent results that steadily improve over the years.

5) If the genes you need are not in the gene pool, no amount of selection will put them there. Start with the best stock you can possibly obtain and with great care and discipline, always watch for opportunities to improve your gene pool. Consider this ...

Van Loons and particularly Super 73's have become quite the rage recently.

"... I asked him, 'What methods do you use to get those kinds of results?' Mr. Van Loon looked at me sternly and said, 'Remember this, there is only one thing that is important - good pigeons, nothing else.' "

Tony Rossi, "Louis Van Loon: The Miracle Man from Poppel", The Racing Pigeon Digest, October 15, 1995.

Remember that for genetics to be an advantage, your gene pool must be significantly better than that of your peers. If the Van Loons really represent a step up, they will be an advantage only until they are widespread.

To maintain a consistent advantage requires that you either continually discover the hot new lines early or that you out breed your competitors.

6) Inbreeding should only be done with world class animals. If you inbreed with average animals you will develop a line that is only capable of producing average animals.

7) Inbreeding decreases the effect of heterosis (or hybrid vigor). This will require that you distinguish between your breeding and racing programs.

8) Assuming the appropriate genes are in your gene pool, your results are directly related to the intensity of your selection and the time period over which this selection is exerted. In other words:

Results = (Selection Pressure) X (Time)

9) Selection pressure is determined solely by the criterion you use to cull and the extent to which you apply it. If you want to make progress you must cull. If you want to make a lot of progress you must cull hard and cull often. Even among world class animals you shouldn't expect to retain more than one in ten.

10) You must cull fairly. Remember the criterion you apply must in fact measure the traits you are selecting for and they must be measured evenly for all members of the selection group. Two examples of applying this principle: 1 - use contemporary group testing 2 - select directly for the traits of interest instead of selecting for correlated traits.

1) Pedigree isn't important, it's performance that counts!

The pedigree tells you an enormous amount about the gene pool from which the individual was bred. Of course it is important. It is extremely important! Obviously though, it isn't the only thing that is important. I want a breeder who comes from a long line of performers and from a line which has narrowed the gene pool so that I get a high degree of offspring who also perform well. I also want that pedigree in order to know how closely it is related to my existing gene pool. An outcross will result in the addition of new genes and will therefore broaden my gene pool and increase the variability I will see in my youngsters. As a breeder, I need to have a sense of how much variability I am adding before I throw away years of careful selection. Naturally, a sloppy or untrusted pedigree is the equivalent of no pedigree.

1) Consider this example:

		1376
	1017	
447		834
		192
	834	
		1175
		191
1001	1376	
		1036
		192
	834	
		1175

1) On the surface nothing seems exceptional. The animal is inbred and so there should be some uniformity in what it produces, but there are no flying or progeny records indicated for any of these birds. Many people would argue that it would be pointless to go back any further than the third generation since the contribution of any one bird would be minuscule.

Agreed?

1) The percentages of Og and Meadowlane in this animal are 36% and 36% respectively. Og and Meadowlane are dead. This bird is a 1996 hatch. In my program, this bird is priceless, but I would never have known it if I hadn't looked in detail at the pedigree.

		1376	Og Meadowlane Twice
	1017		
447		834	Og Meadowlane 4 Times
		192	Og Meadowlane Twice
	834		
		1175	Og Meadowlane Twice
		191	Direct son Og Meadowlane
1001	1376		
		1036	Og Meadowlane Once
		192	Og Meadowlane Twice
	834		
		1175	Og Meadowlane Twice

2) I can't use this bird because it isn't a pure (Janssen or VanLoon or your favorite family).

The whole point of inbreeding is to increase the percentage of quality animals. However as the gene pool becomes more restricted to those "good" genes, the crop becomes more uniform. We reach a point where they are all good, but they are all the same. In the pigeon racing sport, "good" is a relative term and what was good twenty years ago is not really competitive today. As breeders, we must continually raise the standard. In an inbreeding program, this will require an outcross. It is far better that the "outcross" be a series of mild course adjustments over the years, rather than a radical cross to a totally unrelated animal.

If the animal in question is significantly superior to the birds in your breeding program (as indicated by its racing record or the racing record of its offspring) and if it is mostly of the family of your loft, then it may be the *perfect* addition!

3) This animal is valuable because it is inbred.

Inbreeding is a tool. The product of the use of the tool depends completely on the craftsman and not the tool.

If the bird is a superior animal, then I believe it is more valuable if it is inbred because it is more likely to pass on its superior traits to a higher percentage of its offspring than if it isn't inbred. Similarly, if the animal is not of superior quality and it is inbred, it may well only produce mediocre animals

I have in the past seen national champions in other species produced from poor individuals that were the inbred product of national champions. Given no other options, I would use such an animal in the breeding program. I would expect though to have to cull most of the youngsters and would patiently wait for the right one to eventually segregate out of the pool.

4) Old Birds Don't Breed Winners.

True for hens. Remember the effects of environment begin at conception and not at hatching. For this reason a young and healthy female is preferred to provide the best environment inside the egg. Going one step further, you will fully maximize this aspect of breeding racers by using yearling F1 hens with outstanding young bird racing records and who are themselves from distingished parents.

False for cocks. Remember that breeding and raising the young are two different propositions. If the cock is too old to pump well or if raising youngsters will be too much of a physical drain on him, then use young proven pumpers.

5) "I must be careful not to inbreed too much."

Again, inbreeding is a tool. Using it even once with the wrong birds is using it too much. With the right birds and in the hands of someone who understanding what they are doing (and who observes the results and thinks about what the results mean) it is not possible to inbreed too much. The bird on slide 20 is real and I may well breed brothers and sisters off this mating together in the next generation.

True, if the inbreeding is taken to an extreme, the straightbreds may be sufficiently disadvantaged that they are not competitive in racing. However, the heterosis is 100% fully restored in the very first generation of the cross. In other words, this situation is very easily managed.

Extreme inbreeding can also affect breeding vitality and this must be watched. However, scientists have been able to create isogenic strains from 35 plus generations of full sib matings and so it can be managed even if we were to take inbreeding to this unlikely extreme.

6) "This is how you inbreed - start with cousins to cousins and aunts to nephews ... then repeat this for …"

There are no simple formulas. Who gets paired is so fully dependent upon the animals at hand and the objectives you have in mind that it is simply foolish to try to reduce it to a cookbook methodology.

To follow such a plan would be analogous to building a house by "sawing boards for three days, then hammering nails for four days then …".

1) Make sure that every other aspect of your racing program is competitive. Genetically superior birds can consistently fail to win if the environmental factors among competitors are sufficiently superior.

2a) If the above is satisfied and your best birds are still not superior to your competition, then look to add some new birds to your program.

2b) I would recommend a good sample (at least 2 pair) of a single gene pool that is clearly superior based on race results.

2c) I would place a premium on a gene pool which is already narrowed. If you are having to start over, start at the top and avoid the time it takes to reinvent the wheel.

2d) I would obtain the very best animals from this pool that I could get my hands on. Recognize though that average animals from a superior inbred pool are potentially more valuable than very good animals from a widely diverse pool.

2e) In either case, you will want to test the progeny of your purchase and reacquire stock if they do not measure up. Remember your acquisition was only a sample of the gene pool. You may not have gathered the right genes. It is also possible that the right genes are not really in the pool you selected from and you should try another source. The true value of animals from a high quality narrow pool is truly extraordinary.

2f) If, on the other hand, your birds are already superior but you have been practicing years of continuous outcrossing, you might consider closing the pool to further outcrosses for awhile and narrowing it so as to increase the uniformity of your crop.

3) Heterosis (hybrid vigor) provides such a significant boost to the performance of the racing pigeon that you should assure that a significant portion of your race team is the result of a cross between two separate and largely unrelated families. In my loft, all the first round are crosses and then subsequent rounds are bred straight. I fly (for testing purposes) the first two rounds. Do not breed from the crosses except to produce racers!

4) Always maintain at least two generations in the stock loft. Progress is very often measured in two steps forward and one step back.

5) Test, cull, test, cull, test, cull, test, cull …

6) Selection is a three stage process:

   The 1st cut is based on the bird's potential

   The 2nd cut is based on actual performance

   The 3rd cut is based on the performance and/or breeding of the progeny

7) Plan, execute, OBSERVE, THINK. Repeat.