

Linebreeding Practices in Psittacine Husbandry



By Linda S. Rubin
Aves Communications/Tangowood Aviary
NCS Genetics Consultant &
NCS Panel Judge: National Cockatiel Society
SPBE Panel Judge: Society of Parrot Breeders & Exhibitors
Paper originally presented at the 2004 AFA Convention



INTRODUCTION

It is not unusual for beginner and novice parrot and cockatiel breeders to misunderstand the topic of linebreeding and inbreeding. Often times I'm asked, "What is the closest a cockatiel could be related to another cockatiel without producing genetic defects or lethal factors?"

INBREEDING

To answer that question we must first define inbreeding. Among the stricter proponents, inbreeding includes pairings such as parent to offspring, sibling-to-sibling, and half-sibling to half-sibling. A less strict definition confines inbreeding to brother-sister pairings only. This article will refer to inbreeding as the breeding of brother to sister pairings.

Some readers may be surprised to learn that the closest genetic breeding is to mate brother to sister. Genetically, brother to sister pairings are the most identical to one another, closer even than to their own parents. Because each sibling inherits half its biological genome (all its genes) from its sire, and the other half from its dam, each chick shares nearly the same identical genes as its siblings.

By comparison, a son paired to its own mother would share only half its genes with its dam; similarly, a daughter paired to its own father would share only half its genes with its sire. Because full siblings carry genes from both their parents, brothers and sisters would share the greatest number of genes in common.

Now, with that being said, it is best understood that most hobbyists should never breed brother to sister pairings, most of the time, in the majority of circumstances. Although special conditions do exist where inbreeding may be permitted, they are better intended for the advanced champion breeder and never for the inexperienced to experiment with.

Unfortunately, it is often the beginner or novice breeder who unwittingly or unknowingly dabbles the most in inbreeding! For example, siblings bred from one pair may take advantage of breeding with one another; or, the hobbyist may allow full or half siblings to breed, not fully understanding the dangers and consequences of such unions.

Inbreeding should only be undertaken in a well-established linebreeding program where the aviculturist has many years - often more than a decade - of background knowledge and experience or fully understands exactly what is to be accomplished by the union. Ideally, a planned inbreeding trial is carried out with the express purpose of introducing a new characteristic into an existing, established line. The goal of the inbreeding trial is to set an identifiable characteristic (e.g., a new color or superior show trait) into a line in order to create a new strain, embedding this characteristic within an already developed aviary stud.

However, in inbreeding practices, not only will all the superior, (positive), recessive traits rise to the surface; inbreeding will also force all the inferior,

(bad), recessive traits to the surface. By trait, I am referring to any inherited gene for color, shape, size, personality, fertility, parenting skills, immune system, health, or any other visible or invisible characteristic. There are countless traits that are inherited through the genes of an individual bird. Although this process also applies to linebreeding, it is even more intense in inbreeding practices.

So why breed brother to sister? Brother to sister matings can be attempted under very special circumstances such as setting a particular trait into proven, pedigreed champion or grand champion stock where the seasoned aviculturist fully understands the benefits and risks taken. However, serious culling of the stock is necessary, usually by selling off as pets any undesirable birds produced.

In informed inbreeding practices among seasoned breeders - contrary to horror stories - not all young produced are hideous, monster chicks! Unfortunately, frightening stories about inbreeding among humans, or inappropriate pairs of animals that are not suitable candidates are what abound. The taboo is necessary among humans, but not among all animal pairings. Livestock husbandry is based upon linebreeding and occasional inbreeding practices.

In fact, if superior champion birds are used it is possible to produce a highly valued trait. However, simply pairing a brother-sister combination merely because they are "champion stock" does not guarantee this result! One must know precisely what the goal of a union is and which trait is sought.

There can also be special exceptions necessitating inbreeding such as when there are no other relatives available, or when attempting to quickly prove a new color mutation. However, even then it would be safer, and more preferable, to breed back to a parent because parent and offspring share only half the genes as compared to full siblings.

An emphasized word of caution, however. There is usually little need to breed this closely if a more patient, planned breeding program is used and other family members are substituted. Even in the case of a new color mutation, the impatient frenzy to dive in headfirst without understanding the repercussions of lethal factors and complications (such as the loss of size, vigor and vitality and other health issues) can create serious problems. In the long run, a healthy, robust line can be formed over several generations if a responsible, carefully crafted, linebreeding plan is adopted.

So, what can happen when breeding brother to sister pairings? For the majority, inbreeding can result in lethal factors such as producing a preponderance of dead in shell babies, chicks failing to thrive or that may die prior to weaning, inherited health problems, weakened immune systems, and any number of outward physical maladies, conditions, or show "faults" we wish to avoid. Yes, there can be a time for inbreeding, but it is usually reserved for superior quality birds raised by well-educated and experienced aviculturists.

LINEBREEDING

Fortunately, however, there are other methods to use in order to establish an aviary stud. Linebreeding techniques, the use of less closely related relatives, are both useful and necessary whenever building or maintaining breeding studs. In fact, without linebreeding related birds, you won't develop a strain or stud of your own!

Why use linebreeding programs? Because the improvement of our birds is based on livestock husbandry principles that outline planned, linebreeding techniques, and sometimes even the sporadic use of inbreeding IF it is advantageous to the line. If you are at all interested in establishing your own aviary stud that perpetuates valued characteristics from generation to generation, then linebreeding is absolutely necessary. In order to create family lines and develop different strains of birds that excel in specific characteristics, be it show qualities, health, personality, parenting skills, or anything else, linebreeding is essential.

Linebreeding enables the aviculturist to create individual family lines, develop different strains and bring them together to form a unique aviary stud. The purpose of linebreeding is to set selected, desirable traits into a breeding stud so that all birds will inherit these traits as part of their genotype. In turn, these traits will be passed down to future offspring because they are inherited within the line(s). In well-worked studs, these traits can even become recognizable as originating from a specific aviary, e.g., from "John Doe's line of birds." Some cockatiel studs are known for producing outstanding traits or characteristics, such as very large size, "steam-boat" crests, super-sized cheek patches, creative whistling ability, high fertility, devoted parenting skills, and so on.

Because a unique, individual breeding stud cannot be created or maintained without the practice of breeding related birds, top breeders and exhibitors routinely practice linebreeding. By only working with unrelated birds (known as "outcrosses"), you simply cannot

establish or set inherited traits into your lines. Such traits may be inherited in the short term but will be lost if not bred back into the line. Linebreeding is the only way to accomplish the setting of desirable traits among a flock from generation to generation.

BUILDING A LINE BREEDING PROGRAM

If you are truly dedicated to starting your own aviary stud, it is wise to keep only the very best birds that you own - provided they outwardly show the qualities you wish to set in a future stud. Either keep your other stock separate to produce pets, or keep those dearest to you as your own special pets but do not include them in your breeding program.

If none of your birds are of high quality, you may instead wish to start from scratch. Most of the time this is the easier route to undertake, because by buying only a few top quality pairs of birds you will have the traits you need to work with right away.

Also, it is best not to purchase stock from more than two or three breeders to start. The goal is not to buy birds from everywhere and everyone, because you will end up losing the very traits you purchased once you breed many unrelated birds together. Unrelated birds act as outcrosses and you will need a written plan as to why one bird is partnered to another, just as you do with linebred birds.

It is imperative that the cockatiels you purchase are linebred from a top stud if you wish to retain the genotypes (full genetic makeup) you are purchasing. Linebred birds will have identifiable visual traits, (and invisible traits such as health, etc.), that have been bred into the lines that are dominant from generation to generation. These traits, when correctly paired, should also work for you. When selecting future stock, ask the breeder whether the birds are linebred, then ask which traits are set into the line (e.g., head width, crest density, round cheek patch, extended mask, high wing carriage, healthy immune system, high fertility rate, etc.). Any "set" or physically dominant trait should be visible to you or proven in offspring.

LIVESTOCK BREEDING PRINCIPLES

The best advice for any livestock breeder is to purchase the best birds you can afford to buy. This may mean starting with only two pairs of birds if they are all you can afford. Or, if using your own birds as foundation stock, you may have to breed several generations to produce superior birds before crossing them back to relatives or ancestors in order to set the trait(s).

There are many different linebreeding programs from which to choose. Some of the most common are breeding the best opposite sex offspring back to its parent or grandparent. This type of breeding will establish a line based upon the best cock (father or grandfather), and/or the best hen (mother or grandmother). Some breeding programs advocate pairing the best cock to the best hen, then the second best cock to the second best hen, and so on. Because it is taxing to allow hens to produce many eggs, it is also common to breed more than one hen to the best cock in the aviary. Depending upon the results, the best half-siblings produced can then be bred back to either their parents, to one another, or used in more distant unions.

Once each line has been developed with set traits, the lines may be merged together so that you create your own strain or collection of inherited, recognizable traits. If each strain is kept separate, they can even act as your own outcrosses whenever necessary. Eventually, over time, you will have several strains from which to form your entire breeding stud. There are entire volumes published on livestock husbandry techniques that apply equally well to aviculture and raising birds, and aviculturists will do well to consult them.

Remember three important points:

- 1) Do not buy from too many breeders. Limit yourself to two or three seasoned breeders - you may want to go to advanced breeders or judges who are continually successful on the show bench. Buying from too many sources is like trying to finish a jigsaw puzzle that has too many pieces. You will ultimately lose the picture because not all the pieces will fit the puzzle and there will be far too many pieces left over.
- 2) Buy linebred birds. It is better to buy good quality, linebred birds that you know have set characteristics

The Parrotlet Ranch
Specializing in Rare Species/Subspecies/Color Mutations
Hand Raised Parrotlets



Sandee and
Robert Molenda
P.O. Box 2547
Santa Cruz, CA 95063
Phone (831) 688-5560
Fax (831) 689-9534

VISA & M/C Accepted
www.parrotletranch.com

MAP Certification # 182

and a detailed pedigree illustrating the success of its family line, than to buy unrelated outcrosses, no matter how lovely the birds may appear. First, you can only guess about the history of an outcross and whether any good qualities are set as dominant traits. Second, you won't know whether the outcross has any lethal factors set as recessive traits. Once your breeding program is at a certain point, you will need to bring in an unrelated outcross. However, you can buy a bird from another linebreeding program so that it acts both as an outcross, yet still guarantees (as a linebred bird) to set the necessary missing traits back into your line while invigorating your stock!

3) Recognize that you get what you pay for! Understandably, accomplished breeders who have carefully linebred birds for generations, providing top nutrition and selectively breeding for health, visual, and other qualities, are going to set higher prices than what you may find at most pet stores or from a less knowledgeable breeder. Supply and demand - it's purely the economics of the situation. If a beginning breeder doesn't wish to pay top dollar for linebred birds, then they may prefer to take the much more patient path and create their own.

LINDA S. RUBIN has an international byline as a writer and speaker with over 25 years experience breeding cockatiels and other parrots. She is the author of the "National Cockatiel Society's Show Standard of Excellence," and her books include: "Cockatiel Genetics Made Easy!" "Multiple Bird Households," "Ultimate Parrot Guide," and a forthcoming edition of "The Encyclopedia of Cockatiels."

For information on the National Cockatiel Society, Inc. or the Society of Parrot Breeders & Exhibitors, Inc., contact the author at:
LSRaves@aol.com. ■



We have 13 Species of Cockatoos, 9 Species of Macaws, 10 Species of Amazons, Queen of Bavaria Conures, Red Sided Eclectus, 3 Species of Caiques, Blue Quakers, Derbyan, Blue-headed Pionus and Hawk-headed Parrots. We offer Hand Raised, Fully Fledged Companion Parrots and Parent Raised Unrelated Juveniles for breeding.

We are a distributor for Hagen Products
662-673-8100 • Fax: 662-673-2226 • Email: MSPPatch@aol.com
• www.ppatchparrots.com