Feather

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The following article has been prepared from a lecture I gave to Newcastle Budgerigar Club of Australia.

Following is an insight into what is a very complicated subject. That is Feather Quality!

The overall appearance of our exhibition Budgerigars is the result of a combination of many components. Bone structure, skeletal dimensions, muscle, fat and the all-important feathers are the basic components, which make up our exhibition Budgerigars. Whether the bird is of excellent quality or not will depend upon the configuration of these components. Furthermore, the way a bird controls its feathers and the direction they are held, will also have a major bearing on our Budgerigars appearance.

Feather is probably the most important and least understood aspect of breeding exhibition quality Budgerigars.

Feather has responsibility for the following list of features that make up the exhibition bird of today.

The below list is only basic; however you can see how important feather is. Therefore a basic understanding of feather is necessary if you wish to be successful with exhibition budgerigars.

- Variety: Whether the bird is a Opaline, Cinnamon, Clearwing or Pied, its variety is expressed by feather.
- Colour: The birds colour is expressed by feathers that are blue, violet or dark green etc. Also if the bird is of good colour or not it will be displayed by feather.

- Markings: A bird's markings are also displayed by the feathers. Wing markings, spots etc., both good and bad markings must be considered. The markings on a bird are something which is neglected by the general fancy. We should consider the definition or clarity along with intensity of markings when pairing to produce the ultimate bird. A bird with exceptional markings always stands apart from the less than perfect counter parts.
- Size and Shape of the Bird: The more feathers a bird have, generally the larger it will appear. The shape of the bird is a combination of the Skeleton, Muscle and Fat as mentioned earlier along with the feather it carries and where the feathers are located / concentrated.

The all-important Top end

In my opinion the most important part of the Budgerigar and the part which attracts immediate attention is its "Top End". Even though we must consider the whole bird, the head and face seem to be so important for that first and lasting impression.

Following are the exhibition characteristics and how feather controls their appearance.

- **Mask:** it is impossible to have a deep mask without length of feather.
- **Spot (size/shape):** To have a large well shaped spots you need to have a feather that is proportionally wide and long. It must be obvious we cannot have a large spot on a small feather although the reverse is true. I do not have an answer to controlling spots. I think spots are inherited randomly with regards to shape and size. However if your birds are from a family strong in this feature, you are well on the way to having good spot on your babies. The shape and position of the spots should not be neglected either, on at least one side of the pairing you should have round and reasonably well positioned spots. This will help alleviate misshapen spots and split masks in your birds.
- **Cap:** The cap on a Budgerigar is the direct result of the length and width of the feathers on the top and over the crown of the head. Feather direction is so important in this area, especially when the bird relaxes, and the top end feathers are 'blown'. If you have the correct feather in this area and the bird

has the ability to unleash the cap feathers, transforming its top end to give the frontal, lift and brow we now require. The crowning glory of the Budgerigar!

- **Back skull:** A bird has to have a lovely collar of feather which extends up from the shoulder region, filling in the portion of the bird which starts about the crown of the bird and flows over to the back of the bird (nape) in one extended graceful sweep. Back skull is the feature which gives the birds the appearance of having a beautifully rounded head from whichever angle you view the bird. Without this feature in your birds, you will not achieve a good back line. Poor back skull, equals poor back line. Nothing looks worse than birds which cut away behind the head. Birds that lack back skull should be eradicated immediately as this is a very invasive and dominant fault, if not kept in check.
- **Shoulder:** This is a debatable area; I think good shoulder is a combination of the birds skeletal and muscular system combined again with feather. To have great shoulder a bird needs to have a wonderful full collar of feather around the top end of the bird, from the wing butts upwards. If your birds do not have shoulder they will not have width of mask. The "BIG FACE" look we all aspire to have on our birds.

Along with the above features the bird must hold each individual feather around the beak or facial area in a different direction, giving the impression of the feathers radiating out from the beak. Thus giving the bird a tucked in beak and head width, these are probably the hardest features to obtain and then retain.

Feather Descriptions Misleading

To date feather has been discussed by the fancy as being — Yellow, Intermediate and Buff — this is a dreadful over simplification of a very complexly structured piece of material. It would seem this description was put forward many years ago. I am led to believe it was taken from the canary fanciers of the time, who used it as a classification of the colour of their bird’s feathers. I am not convinced it had anything to do with large or small feathers as both buff and yellow coloured canaries are essentially the same size. Members of the hobby, since and to-date, have endorsed this concept by adopting its usage without giving feather on Budgerigars in particular,

too much thought. We probably could justify it as being a broad classification of feathers. But apart from that, this simplistic classification is useless and basically meaningless. Most experienced breeders would realize feathers are much more complex than that.

From studying feathers for many years on Canaries, Zebra Finches and for the past sixteen years on Budgerigars I have come to the following conclusion. All corresponding feathers on birds of the same species are different. To explain this further, each species of bird is different from each other species; a duck has a different feather structure to a sparrow as an example. Most importantly, ***all Budgerigars have a different feather structure to each other***, it could be considered a bird's finger print. Therefore, ***no two Budgerigar's feather structures are exactly alike***. The difference between individuals may be unperceivable, but there will be a difference!

Individual Feather characteristics

Following are the feather variables we must contend with when breeding birds for exhibition. Each one of the following feather features has a bearing on the visual qualities of our birds.

Length: - Length of feather is self-explanatory. Our bird's feathers can be short as is the case on a pet bird or they can be extremely long, also they can be any length in between. Feather length alone is not responsible for the Supreme exhibition birds of today, this is a common misconception. Granted it is important but only in conjunction with the following feather features.

Width: - Width is the distance across the feather, a feather can be narrow or wide and as above any width between these parameters. From my observations I believe feather width acts independently to feather length.

Shape: - The feather can be rounded, squared off or even pointed. Possibly feather shape could be almost limitless.

Thickness: - Feathers are not mono or even bi-dimensional. They are three dimensional like all matter, not only does a feather have length, width and shape. It also has thickness and especially the feather shaft. This could be explained as the distance from the front or outside of the feather through to the inside or back of the feather. If you have a thinner feather and still maintain the other dimensions of width and length, the bird will exhibit all the great features which come with the extra larger feathers whilst keeping the bird tidy because the feathers can lay closer on top of each other.

Structure: - feather structure is its actual components that are the feather shaft, the down, the barbs etc. It would be reasonable to expect and is the thinking of some experienced fanciers, a new mutation or variety brings with it a new type of feather construction. Thus in some cases it is capable of changing other varieties feather structure when utilized with them, both good and bad, the Opaline and Cinnamon would be good examples.

The spangle is the most recent on the scene and it appeared to have some very positive influences on all varieties of Budgerigars. It should also be noted, the spangle was first introduced into Germany via Switzerland and this variety may be an important factor in their new style of budgerigar. Without harping about the Mannes birds, it has also been substantiated his feather structure is different to the norm. The electron micro scope has indicated his feathers have more barbules per millimetre than comparable size feathers from the UK. A possible explanation as to why his birds while retaining their massive bulk appear to have a beautiful finish to their feathers, giving them a delightful soft sheen.

If I had the chance, I would question as to which varieties of birds the feathers for these studies were collected. It would certainly give a fuller picture to the findings. Just putting my thoughts forward, it would appear to me, the finish Mannes has achieved, on his birds is not that dissimilar to the finish on Cinnamon Budgerigars. It may be the case and is possible the cinnamon characteristics could have crossed over and aligned themselves with the elementary budgerigar feather genes. Therefore through selection Mannes has fixed this across all varieties in his stud.

Down: - The amount of down at the base of each feather will have a definite bearing on the appearance of the bird. The down acts as a packing underneath the feathers, holding them off the body giving the bird the illusion of being larger. During a lecture given by Fred Sherman some years ago in Tasmania, he claimed to have built his formidable stud at that time, by the observation of feather down on the babies in the nest and selecting for this when pairing up. So down is definitely very important in the appearance of the finished bird.

Density: - The density of feather is the number of feathers on a bird. Birds which impress me appear to have many more feathers on them than the average bird. Density of feather also keeps the bird looking better under the stress of judging or whatever. This feature is an absolute asset in the production of top quality Budgerigars. Somehow it gives the impression of the bird being tight feathered which is not normally the case with heavy feathered birds. I have noticed on my better birds, more feathers on the top end, this coupled with good feather structure gives some uniquely large headed specimens. This feature may in fact be an illusion as I have no way of counting the feathers to see if this is correct. However as I said there appears to be more feathers.

Distribution: - The location of the feathers on the bird. As above we are looking for a concentration of feather on the head, a lovely collar of feather to give back skull and a full back line whilst enhancing the shoulder and width of mask. You can have a bird with lovely feather but if it is in the wrong places it is useless, you will end up with nothing but untidy bags of feathers. I believe this was the case with the old Australian birds. We always had the feather qualities we needed, before we started to import birds from the UK. However, the birds we were breeding had the feathers concentrated in the wrong places. Most particularly on the top end of the Budgerigar i.e. Head, shoulder and face.

From the above feather features we can see how meaningless the words Yellow and Buff are as an explanation or description of the particular feather any of our birds are carrying.

Some of the above individual feather features are very hard to identify, however if you study your birds overall feather appearance, whilst keeping the above in mind, I am sure you will see your birds in a very different light.

The mode of inheritance of feather

My observations would suggest the Yellow to buff pairing theory which has been touted for decades is without foundation. There is nothing I have seen which confirms the pairing of yellow or finer type feathered birds to Buff or longer feathered birds produces a blend somewhere in between, described as the intermediate feathered bird. Intermediate birds being put forward as the required show bird. There is also no evidence to substantiate the continual pairing of the so called buff birds together will make your birds become more or double buff. This concept would have its beginnings placed some sixty years ago.

I can't understand why they keep pushing this theory, it is obviously wrong. Feather is not passed on in such a simple manner. After many years of breeding and studying the feathers as I said before on exhibition Budgerigars, Canaries and Finches, I still **do not** believe it is possible to manipulate feather. The type of feather an individual budgerigar ends up with is basically in the "laps of the gods".

It is has also been said, "Buff feather is recessive"! How can it be? If you pair two so called buff birds together what do you breed? (Answer from the floor) "*Anything and everything, no consistency what so ever*". Exactly! Blue is recessive, if you pair two Blues together or two Recessive Pieds together you will breed 100% Blues and Recessive Pieds respectively. If this is the case, "how can buff feather be recessive"?

Leaving the above aside, I will endeavour to explain how I believe feather is inherited. Basically we need to understand; features, whether they be on a Budgerigar or any living thing, are passed on to the next generation by in some cases, many thousands of genes. These genes control the features and everything to do with the offspring. Furthermore, features are either passed on fixed or in a state of constant change.

The first example where the feature is fixed is called **Discontinuous Variation**: - this is where there is no variation passed on to the offspring. My belief is this type of inheritance could be controlled by one single gene and therefore easy to predict and control. An example of this would be the Ino. or blue gene in Budgerigars. These features are passed on without change, in either a visual or latent state, they do not change they are either in the genes or they are not.

The second example which is technically called **Continuous Variation**: - is where the feature is passed on to the next Generation in a modified state, it is Continuously changing from one generation to the next. This inheritance phenomena could be the result of the cumulative effect of many and possibly hundreds of genes, and maybe in the case of overall feather quality and features even thousands of genes.

Consequently feather quality is virtually impossible to control or predict. Examples may help to explain, a Human finger print is continually changing, there are no two finger prints on Earth the same. Human height is another good example of continuous variation. This is how feather is inherited, in a constant state of variation. So each birds feather in the nest is, if you like is a mutation of its parents feathers and **each offspring will be different**.

If we take feather as a two dimensional object i.e. just length and width, you can see we have two factors are in a state of continuous variation, within maximum and minimum parameters. Leaving aside all the other dimensions and features of feathers which could also be in a state of constant change. I would suggest this is why when we pair two lovely birds together we can, and most of the time do, breed less than desirable youngsters! Could this also be why it is so hard to get any continuity of quality in your nests?

"*If the above is the case, why bother*", I hear you say. Well lucky for us, as we know some human parents have a tendency to produce above average height. As it turns out we also have families of budgerigars or individuals for that matter, that tend towards producing excellent quality youngsters, with favourable feather characteristics. It is our responsibility to identify these families or individuals and

concentrate our efforts into them. These good families will still throw out poor babies periodically because you are working against Mother Nature.

Continuous Variation is in essence the basis of Darwin's Law of Evolution: Survival of the fittest. If species were not in a state of constant variation there would not be the genetic diversity within the species in order for it to survive in a continually changing environment.

Remember you are fighting against 4 million years of evolution, thus the bird's readiness to revert to its natural wild state. Quality can only be maintained and improved with attention to detail, keen observation and sensible well thought out actions.

Finally you must select for and concentrate on FEATHER QUALITY!