North East Budgerigar Society

Established 1974

Inc.

Budgie Bulletin

MANAGEMENT COMMITTEE 2020-2021

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NORTH EAST B.S. NEWSLETTER

Issued bi-monthly for the members.

The opinions and ideas expressed in this newsletter are not necessarily those of the North East Budgerigar Society of South Australia Inc.

CLUB OBJECTIVES

TO PROMOTE FEELINGS OF GOOD FELLOWSHIP AND SPORTSMANSHIP AMONG ITS OWN MEMBERS AND ALL OTHER PERSONS INTERESTED IN THE BUDGERIGAR.

TO PROMOTE THE IMPROVEMENT OF EXISTING VARIETIES AND THE PRODUCTION OF NEW ONES.

TO ENDEAVOUR TO PROMOTE, ENCOURAGE AND STIMULATE THE BREEDING OF BUDGERIGARS.

MEMBERSHIP FEES

All subscriptions become due January 1st, 2022.
(Also applies to new members who join after October 1st, 2021, who will be financial for 2022)
SINGLE $20.00, DOUBLE $30 (Single fee plus 50%)
FAMILY Single fee ($20.00) plus 50% single fee for each person over 18 years of age
Under 18 years – no charge in family situation
JUNIOR $13 (65% normal fee)
PENSIONER Single $16, **Double** $24 (Both 80% of normal fee)
PARTNERSHIP $15 per person (75% of normal single fee)
For electronic transfer of membership fees use your name as the reference, and Bank SA BSB 105-146, Account number 547328040.
BCSA Membership fee: $15 per person

Members must be financial with North East Budgerigar Society and BCSA to purchase 2020 rings.

Club meets at Kilburn Hall at 49 Le Hunte St, Kilburn, at 7.30pm on the second Wednesday of every month except December.

Website: https://www.northeastbudgerigarsociety.com

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Editorial

August Meeting cancelled

Coronavirus restrictions for use of the Kilburn Hall required that the Committee cancel the August 11th General Meeting and AGM.

- The AGM will now be moved back to the September 8th meeting date when hall restrictions are likely to ease.
- Coded rings for 2022 need to be ordered during August so liaise with Dennis if these transactions have not already concluded. He is aware that some of you were planning to finalise this at the August meeting.
- Contact Vicki if you require items from the Trading Table prior to the September meeting.

John Mulley, NEBS
Secretary.

******NOTICE TO MEMBERS******

As of the April 2018 Meeting
The start time for the meeting will be 7.30pm.
The day will still be the second Wednesday of the month.

DID YOU KNOW?
YOU CAN SELL BIRDS AT ANY CLUB MEETING
PUT A PRICE ON THE CAGE WITH RUNG NUMBER, YEAR AND SEX
IF THE BIRD SELLS, THEN DONATE $2 TO THE CLUB

Rings

2021 Ring Issue

I still have 2021 (VIOLET) NE coded rings left for sale.

2022 Ring Issue

The NEBS order for 2022 rings (BROWN) (changed from Orange to Brown by WBO) needs to be finalized by the end of August 2021. Our usual NE coded rings will be bulk ordered and will be based on historical ring sales.
However, members requiring **personally coded** rings will need to place their order with me by the August general meeting (11th August).
The 2022 rings are expected to be available as from 15th December 2021.

Dennis Lomman

Ring Officer
5 August 2021

Discovery of the Colour Gene *MuPKS* and its Blue Mutation in Budgerigars, and plausible mechanisms for Yellow Faced Blue, Golden Faced Blue and White Cap

John Mulley AO PhD, July 2021

Introduction

Back in June 2015 in an Editorial in Budgie Bulletin I reported that the genome of the budgerigar had been sequenced. This collaborative effort among genome scientists from the USA and China provided the DNA blueprint for the discovery of genes responsible for the budgerigar colours and varieties: Ganapathy, G., Howard, J.T., Ward, J.M., Li, J., Li, B., Li, Y., Xiong, Y., Zhang, Y., Zhou, S., Schwartz, D.C., Schatz, M., Aboukhalil, R., Fedrigo, O. Bukovnik, L., Wang, T., Wray, G., Rasolonjatovo, I., Winer, R., Knight, J. R., Koren, S., Warren, W.C., Zhang, G., Phillippy, A.M., Jarvis, E.D. (2014). High-coverage sequencing and annotated assemblies of the budgerigar genome. Gigascience 3, 11-19.

Discovery of the Colour Gene

The first budgerigar gene for a colour or variety to be identified at the molecular level was the colour gene *MuPKS* in 2017. The colour gene is simply the gene that encodes the enzyme that synthesises the yellow pigment psittacofulvin. Discovery was achieved by a team of molecular geneticists, genome scientists, biochemists and cell biologists from the USA and Taiwan: Cooke, T.F., Fischer, C.R., Wu, P., Jiang, T-X,. Xie, K.T., Kuo, J., Doctorov, E., Zehnder, A., Khosla, C., Chuong, C-M., Bustamante, C.D. (2017). Genetic mapping and biochemical basis of yellow pigmentation in budgerigars. Cell 171: 427-439.

The DNA sequence for the colour gene *MuPKS* and its mutations are responsible in budgerigars for the Green-Golden Faced Blue-Yellow Faced Blue-White Cap-Blue allelic series (sometimes referred to as allelomorphs since they are controlled by the same gene). Genetically these phenotypes are allelic as we have all proven by the crosses we do in the breeding room, but the molecular basis to explain what we see (the phenotypes) was lacking until now. These colour phenotypes are expressed in all varieties of budgerigars from Normals at the top of the Australian National Budgerigar Council Matrix down to Cresteds at the bottom. Understanding the Matrix provides the fundamental guide for judges, show managers and exhibitors of the exhibition budgerigar in Australia.

The colour gene *MuPKS* is that part of the budgerigar DNA sequence that codes for the enzyme polyketide synthase that produces the yellow pigment responsible for green budgerigars. The recessive blue mutation of *MuPKS* is a loss of function mutation that abolishes production of yellow pigment leaving the feather structure to reflect blue light. This gene is the first to be identified for a Mendelian colour or variety trait in budgerigars. It synthesises the yellow to red pigment spectrum of psittacofulvin that is the mechanism for feather colouration unique to parrots. The red component is missing from budgerigars which is a mystery yet to be solved. Mapping and identifying genes for the other Mendelian traits in budgerigars could theoretically be carried out in the same way that succeeded for the discovery of *MuPKS*. A simplified account that led to the discovery of the

colour gene can be summarised as follows:

Physical map of the budgerigar genome

The project to discover the colour gene was based on the premise that on an evolutionary timescale relatively few generations have elapsed since the time the first blue budgerigar appeared in an aviary. Although there may have been multiple independent origins of a recessive blue mutation circulating among wild green budgerigars split for blue, hidden by the dominant green allele, most likely only one of these became the founding blue mutation in our domesticated budgerigars. The founding blue bird needed to carry a pair of blue mutations and likely these were identical by descent from a single ancestral mutational event being finally exposed some generations later through inbreeding. This domesticated blue bird survived because it was protected in an aviary environment.

An ancestral blue mutation should under those circumstances exhibit linkage disequilibrium with nearby genetic markers. Linkage disequilibrium in populations is where the distribution of alleles at closely spaced adjacent positions (loci) is non-random, retaining the pattern surrounding the mutation in the ancestral blue bird. The rate of decay of linkage disequilibrium over time by recombination is proportional to the distance between loci. Recombination with an example of strong linkage disequilibrium between German Fallows and the grey mutation was explained in the February 2021 edition of Budgie Bulletin.

If linkage disequilibrium remains for markers close to the blue mutation in the budgerigar DNA sequence, then the location of the blue mutation within the budgerigar genome can in theory be determined by the technique of association mapping. But before that, many genetic markers needed to be characterised and mapped to linkage groups corresponding to each of the budgerigar chromosomes.

SNP discovery and Mapping the Blue Locus to a Chromosome

Ideal genetic markers are SNPs (single-nucleotide polymorphisms). These are stable single base changes within the genomic DNA sequence discovered in this instance by an advanced DNA sequencing method. DNA was sequenced from 234 budgerigars of which 105 were blue as well as 15 museum specimens of wild budgerigars from Australian museum specimens.

This provided 69,855 SNP markers at polymorphic frequency suitable for association mapping. Polymorphic markers are positions in the genome that segregate alternative nucleotide bases in the DNA sequence. SNP variation within the DNA sequence of any organism, including us, generally has little if any detectable effect on the biological fitness or appearance of the carrier. SNP positions within the genome sequence can be precisely determined and several from a single region on chromosome 1 (the largest chromosome in budgerigars) were consistent with complete linkage disequilibrium but only among budgerigars with the blue mutation. This was the entrée to discovery of the colour gene, among about 20,000 other genes that may exist in the budgerigar genome.

The Single Ancestral Haplotype Associated with the Blue Trait

A haplotype is a run of alleles at adjacent SNP positions "closely" located with each other along the chromosome. All blue budgerigars shared a single haplotype in complete linkage disequilibrium within a 400,000 base pair DNA sequence located between SNPs at base pair coordinates 21,019,187 and 21,445,705. Within this region of the chromosome there were 11 distinct DNA sequences predicted from computer software analysis likely to represent genes.

The sequence of one of these genes which they named *MuPKS* was predicted to encode a previously uncharacterised enzyme. The predicted amino acid sequence for this enzyme closely aligned with polyketide synthases across species. This was the most promising of the 11 putative genes from the region of interest for production of psittacofulvin because related polyketide synthases in bacteria and fungi were known to synthesise yellow pigments with similar molecular structures to psittacofulvin.

***MuPKS* Expression in Feathers**

None of the 11 putative genes within the blue associated haplotype showed any differential gene expression between blue and green budgerigars. This included *MuPKS* that was found to be highly expressed in feathers of both blue and green budgerigars. Thus, the recessive blue phenotype is not caused by changes in the expression of any of these 11 genes in budgerigars, including *MuPKS*. It then became necessary to look downstream of gene expression.

It was interesting to discover that the *MuPKS* gene was expressed hundreds to thousands of times higher in budgerigar feathers than its gene homologs in chicken and crow feathers that do not carry yellow psittacofulvin pigment. So, there was still something peculiar about *MuPKS* in budgerigar feathers or its gene product that required further study.

This line of enquiry was developed further after the activity of polyketide synthase was examined in the feathers of green and blue budgerigars. For an enzyme to work properly, firstly the gene encoding that enzyme must be expressed at normal levels, and that is the case for *MuPKS*. Secondly, the transcribed mRNA must be stable. Thirdly, the active site of the translated enzyme must function normally.

A Coding SNP within the *MuPKS* Gene associated with Yellow Pigmentation

Most SNPs occur in non-coding DNA sequence between genes and between the coding elements within genes. Mutant base changes that occur within coding sequences of genes are detrimental if they occur within crucial functional domains. Since variable transcription for *MuPKS* was eliminated, coding changes were sought within the sequences of the 11 genes within the critical 400,000 base pairs that may affect activity of the translated protein. The only protein coding change within a gene was found to be a substitution of the amino acid arginine with the amino acid tryptophan (abbreviated R → W) at residue 644 in the active site of the enzyme polyketide synthase encoded by *MuPKS*. All blue budgerigars were W/W and green birds were either R/R or R/W, indicating that some of the green birds were split blues.

Position 644 of polyketide synthase is highly conserved throughout evolution with an arginine (R) across numerous species from bacteria to vertebrates. That suggests that an amino acid substitution at 644 would be detrimental and carriers weeded out by natural selection if the associated phenotype occurred in wild populations. A single blue budgerigar within a flock of greens would quickly attract a predator's attention. However, protection within an aviary of domesticated budgerigars negates natural selection. To cut a long story short, it was shown experimentally that although the blue mutation does not affect gene expression the enzyme it encodes with the R → W amino acid substitution is not active. It does not work so does not produce psittacofulvin. This loss-of-function mutation kills the active site of this enzyme.

Reconstitution of Psittacofulvin Synthesis in Yeast

Strong circumstantial evidence as outlined above strongly supported the R644W substitution in polyketide synthase as the reason why no yellow pigment is produced. This enables us to see reflected blue light from the budgerigar feather without the yellow pigment modifier. Definitive proof came after cloning the budgerigar *MuPKS* gene and expressing it in a yeast host. Organic extracts from the yeast expressing the wildtype budgerigar *MuPKS* gene in yeast were yellow but organic extracts from yeast expressing the blue sequence of the *MuPKS* gene were clear. An experiment mutating the wildtype *MuPKS* gene that had been inserted into the yeast to the blue form of *MuPKS* also produced clear extracts. Comparison between the yellow pigment from the yeast extracts with the yellow pigment from budgerigar feathers by mass spectrometry yielded identical long chain carbon compounds. *MuPKS* is therefore causative beyond doubt for the yellow psittacofulvin pigments found in green budgerigar feathers.

Diverse Functions of Polyketide Synthases

Parrots are the only birds to exhibit psittacofulvin pigmentation but *MuPKS* homologs are widespread across phyla. This suggests that this family of enzymes have a variety of essential functions in addition to pigmentation in budgerigar feathers. How this gene has been harnessed by the parrots to produce the yellow to red psittacofulvins remains a mystery requiring further study. Why budgerigars produce only the yellow form of psittacofulvin is also a mystery, other than knowing that one of the long chain carbon components of psittacofulvin was found to be missing in the budgerigar. But this adaptation combining yellow pigment with the blue reflected light from the underlying feather structure is clearly advantageous for the evolutionary success of the native wild green budgerigar.

Yellow Faced Blues, Golden Faced Blues and White Caps

What must be understood is that these colours are not "varieties" superimposed on Blue. They are alternative colour morphs, distinct from Blue, but controlled by different allelic mutations of the same colour gene that is responsible for blue budgerigars. For example, a Green split Yellow Faced Blue can never pass on Blue because its genotype is Green/Yellow Faced Blue. Yellow Faced Blue is an

independent entity that cannot spin off and pass on Blue. A Golden Faced Blue-Yellow Faced Blue hybrid does not carry a Blue mutation. Similarly, a Yellow Faced Blue-White Cap hybrid does not carry a Blue mutation.

Whilst the molecular basis for green and blue budgerigars is now fully understood following the research published in Cell, DNA sequencing to determine the *MuPKS* mutations responsible for Yellow Faced Blues, Golden Faced Blues and White Caps has not yet been reported. Until then, the cellular mechanisms responsible for these phenotypes can only be speculated. However, armed as we now are with knowledge of *MuPKS* and its gene product polyketide synthase some educated hypotheses can be proposed.

I contacted Professor Carlos Bustamante from Stanford University, the senior and corresponding author on the research paper published in Cell (2017) 171: 427-439 describing the discovery of the *MuPKS* colour gene and its blue mutation. I wondered if they had taken the research further, to include sequencing the other allelomorphs to detect any of the other *MuPKS* mutations. He referred me on to the lead investigator, his former graduate student (PhD student in Australian terminology) to Dr Thomas Cooke. Tom remains extremely interested in the topic although has now moved on to unrelated post-doctoral research.

Thomas speculated that temperature sensitive mutations of *MuPKS* might explain the Golden Faced Blues and Yellow Faced Blues and a regulatory mutation in the promoter region of the *MuPKS* gene or a mutation affecting the stability of its mRNA might explain the White Caps. He referred to a known temperature sensitive mutation in Siamese cats. His hypotheses make perfect sense from the perspective of molecular genetics.

Abbreviations that follow are: B for Blue, YF for Yellow Faced Blue, GF for Golden Faced Blue, WC for White Cap, SF for Single Factor and DF for Double Factor.

Yellow Faced Blues

Siamese cats give us a clue. An established temperature sensitive mutation of the gene encoding tyrosine kinase restricts the distribution of melanin to the coolest part of the Siamese cat: its face, ears, feet and tail.

Thomas Cooke suggested a similar mechanism may account for the restricted distribution of yellow pigment to the crown, frontal and mask of the Yellow Faced Blues. He mentioned that the budgerigar polyketide synthase probably functions as a dimer (by analogy to fatty acid synthase, to which it is closely related in terms of amino acid sequence). Dimers are the functional form of an enzyme commonly seen in enzymology consisting of two amino acid sequences encoded by the same gene bonded end to end to enable them to function enzymatically.

The phenotype YF blue is a hybrid between YF and blue. These hybrids are predicted to have YF-YF, YF-B and B-B polyketide synthase dimer configurations. Subunits would randomly associate in the dimer ratios of 1 : 2 : 1, respectively. The proposal is that yellow pigment is distributed in budgerigar feathers as follows, based on the hypothesis of temperature sensitivity for the YF mutation:

- If the YF-YF homodimer is temperature unstable and therefore non-functional it produces no yellow pigment. That would explain the white face phenotype in the DF YF blues.
- We already know that the B-B homodimer is not functional as proven by the research describing the arginine to tryptophan substitution in polyketide synthase. There is no need to suggest it might be temperature sensitive.
- Assuming that B is temperature stable then it may partially stabilise the YF-B heterodimer allowing some functional enzymatic activity derived from the YF subunit. This dimer configuration might biochemically rescue yellow pigment production to a limited extent. That might explain why yellow pigment is only deposited in the cooler feathers of the SF YF budgerigar, in the feathers of the crown, frontal and mask.

Meaningful laboratory experiments could be designed to test this hypothesis.

Golden Faced Blues

The proposal is that the GF-B heterodimer is slightly more temperature stable than the YF-B heterodimer, with the GF dimer component more active than the YF dimer component.

- That explains the brighter yellow colour on the crown, frontal and mask with more efficient rescue of yellow pigment production by the GF-B heterodimer relative to the YF-B heterodimer.
- Slightly enhanced temperature stability of GF relative to YF also explains why in the SF GF the GF-B heterodimer creates some spillage of yellow pigment throughout the warmer body feathers as the bird ages.
- If the GF-GF homodimer in the DF GF has some degree of temperature stability then that may be sufficient to deposit yellow pigment within the feathers on the cooler crown, frontal and mask, as observed, but not enough to suffuse through the warmer body feathers.

Meaningful laboratory experiments could be designed to test these possibilities. We know from observation that the intensity of the yellow pigment can vary slightly within the Green, Yellow Faced Blue and Golden Faced Blue Series. That adds additional complexity and all one can do is speculate that additional modifier genes of relatively small effect or other regulatory changes within DNA external to the *MuPKS* gene sequence can enhance or dilute the yellow pigment to some degree. Playing around with Yellow Faced Blue-Golden Faced Blue hybrids can have the same outcome. It is the role of judges to ensure the colour groups remain true to their written Standard for the exhibition budgerigar. Unequivocal deep buttercup yellow expressed in Golden Faced Blue on the frontal, crown and mask must remain its distinguishing feature.

White Caps

I mentioned and described the White Cap mutation to Thomas Cooke. This is a

new mutation that he was not aware of from his interactions with North American budgerigar breeders since the White Cap is currently restricted to Australia. An explanation within a Mendelian framework is more straight forward for this mutation. The phenotype could be explained by a mutation in the promoter region of *MuPKS* that significantly reduces but does not eliminate its transcription into mRNA, ultimately reducing the amount of polyketide synthase. Another explanation might be mutation within the *MuPKS* DNA sequence that adversely affects but does not totally kill the active site of the enzyme. Finally, there could be a mutation that affects the stability of its transcribed mRNA. Any of these could reduce the amount of polyketide synthase and yellow pigment.

These moderate loss-of-function mutational mechanisms can easily explain the green body colour for the Double Factor White Cap within a Mendelian framework. The amount of yellow pigment produced would simply be additive, depending on whether one dose of the White Cap mutation is carried in the WC-B hybrid (body appearing aqua) or two doses of this mutation are carried in the double factor WC-WC (body appearing green). The double dose of WC produces more yellow pigment, hence the green body feathers, but not enough yellow pigment is produced to completely cover the cap. Speculation for sure, but testable in the laboratory. Selection of colour modifiers may slightly enhance the extent of the distribution of the white on the cap in the same way that we see subtle variation in intensity of the yellow pigment in the Greens, Yellow Faced Blues and Golden Faced Blues.

I have bred a White Cap/ Yellow Faced Blue hybrid on a grey background. She looks like a Greygreen or a Single Factor Golden Faced Grey. That observation is consistent with additivity of yellow pigment conferred by the White Cap. I just need to mate her back to a Normal Blue Series to verify her genotype. She should produce Yellow Faced Blues and White Caps in roughly equal frequency, but no Blue Series.

Conclusion

Identity of the Colour gene and the molecular basis for its Blue mutation is proven beyond doubt, as published in the Cell article. Plausible mechanisms for its allelic Yellow Faced Blue, Golden Faced Blue and White Cap phenotypes remain speculative until their hypothesised molecular basis and cellular mechanisms can be validated in the laboratory, which is the way science works. I hope this article clarifies the scientific distinction between Colours and Varieties in budgerigars and dispels the myth that the Yellow Faced Series are Varieties rather than part of the beautiful Colour variations seen throughout all the Varieties. Any notion that the green Double Factor White Cap defies the laws of Mendelian inheritance and accepted dominance relationships must also be laid to rest. It is simply another way that variations in the *MuPKS* gene sequence act through its polyketide synthase product to produce yellow psittacofulvin to create green feathers on the body of the budgerigar.

Acknowledgment: I thank Dr Thomas Cooke for generously sharing his thoughts on cellular mechanisms for the Yellow Faced Blue, The Golden Faced Blue and the White Cap. None of that was in the public domain as far as I was aware but provides fascinating insights for students of the budgerigar.

2021 Fisher Annual Show Results

Fisher Show

Held On: Saturday, 19 June 2021
Held At: Kilburn Hall
President: Graeme Alchin
Secretary: John Mulley
Birds Entered: 182
Birds Benched: 118

Benched by Status

103	Open
0	Intermediate
15	Novice

Major Awards

Grand Champion	Dennis Lomman	Dom Pied ASC/ASV Cock
Champion Opposite Sex	S&C Norris	Opaline ASC Hen
Reserve Champion Cock	Marshall Family	Lacewing Cock
Reserve Champion Hen	Butterworth&Trubsha	Cinnamonwing ASC Hen
Third Champion Cock	L&H Edwards	Dom Pied ASC/ASV Cock
Third Champion Hen	S&C Norris	Normal Grey Green Hen
Fourth Champion Cock	Butterworth&Trubsha	Lutino Cock
Fourth Champion Hen	L&H Edwards	Dom Pied ASC/ASV Hen
Fifth Champion Cock	Dennis Lomman	Normal Visual Violet Cock
Fifth Champion Hen	Butterworth&Trubsha	Normal Blue Hen
Best Open Bird	Dennis Lomman	Dom Pied ASC/ASV Cock
Best Open Bird opposite Sex	S&C Norris	Opaline ASC Hen
Best Intermediate Bird	0	#N/A
Best Intermediate Bird Opposite	0	#N/A
Best Novice Bird	Marcus Strudwicke	Normal Grey Cock
Best Novice Bird Opposite Sex	Michael Smith	Dilute Yellow/White Hen
Best Junior Bird	0	#N/A

Best Of Colour/Variety

Normal Green	Marshall Family	**Cinnamonwing**	Butterworth&Trubshaw
Normal Grey Green	Butterworth&Trubshaw	**Spangle Double Factor**	Trevor Russell
Normal Blue	Dennis Lomman	**Opaline ASC**	Dennis Lomman
Normal Visual Violet	Dennis Lomman	**Opaline AOSV**	S&C Norris
Normal Grey	John Mulley	**Clearbody ASC**	Dennis Lomman
Normal Yellow Faced Blue A	John Mulley	**Lacewing**	Marshall Family
Normal Golden Faced Blue A	0	**Fallow ASC**	Michael Smith
Black Eyed Self	John Mulley	**Spangle ASC**	Dennis Lomman
Dilute Yellow/White	John Mulley	**Spangle AOSV**	S&C Norris
Lutino	Butterworth&Trubshaw	**Dominant Pied ASC/ASV**	Dennis Lomman
Albino	Marshall Family	**Recessive Pies ASC/ASV**	Graeme Alchin
Dark Eyed Clear	Marshall Family	**Australian White Cap**	John Mulley
Clearwing ASC	John Mulley	**Crested ASC/ASV**	0
Greywing ASC	Trevor Russell	**Any Other Variety**	Michael Smith
		Ladies Exhibit	Bette Marshall

NEBS TRADING TABLE

The Trading Table has a range of products which are available for purchase at the NEBS Monthly Meetings or from Vicki Sanford on (08)82637369 or at vickisanford@bigpond.com

Nutritional supplements which are popular with members include;

Passwell Liquid Gold
Passwell Budgie Starter
Murphy's Minerals
Calcium & Iodine Bells
Mineral Blocks
Vetafarm Multivet/Moulting Aid
Vetafarm Soluvite D
Vetafarm Breeding Aid
Vetafarm Spark
Elliott's Sulpha D

Other popular products include Vetafarm Triple C* **antibiotic**, Vetafarm **Probiotic*** and Passwell Multi-Clens **disinfectant** as well as various **Wormers** and **Scaly Face** treatments**.**

A range of **accessories** are also available including; Mason Jars and Bases, Drinkers, Wire Fronts for Show Cages, Finger Drawers, Show Cage Carriers, Ring Cutters …….**and more**!

Also ***New and Quality Used Show Cages.***

All these products are available at better than the normal retail price. Some items, e.g. those above with an "*", may not always be immediately available due to their shorter use by dates however they can be readily reordered. Other items can also be ordered on request.

The **BCSA** website can be viewed at *www.bcsa.com.au*.
Results of all Club and State shows are posted on the website. The Photo Gallery features photos of the winning birds.

The **NEBS** website is a subset of the BCSA website and can be accessed by clicking on the NEBS logo on the BCSA Homepage or directly at *www.bcsa.com.au/nebs/.*
Information available on the site includes the NEBS Monthly Meetings Program and the Night Show Schedule.


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INCOME REPORT FOR NORTHEAST BUDGERIGAR CLUB FOR 2020-2021

Hi Everyone, Well it's that time of year again. This year we have actually made a small loss, only $221.28! Due to the impact of Covid 19 we haven't had the usual fund raising opportunities of BCSA Auction Lunch. We have been lucky to be able to have our annual & breeders shows, but due to ongoing Covid food sharing rules, we have had to buy in Subway. This is obviously a lot more expensive than salads with chicken. People have also been slow coming to the Wednesday night meetings, so night raffle proceeds are down, but cost of supplying prizes has not gone done unfortunately. This persistant virus is causing havoc everywhere. We were able to have a Tender Sale late last year & it was wonderful to see everyone come out. Also it will be noted that interest on bank accounts is about half of what it used to be. We don't even get interest on our cheque account any more. I look forward to seeing what the coming year brings for our bird club & hopefully be able to report a small profit next year.
Vicki Sanford, Treasurer NEBS.

INCOME/EXPENDITURE FOR 2020-2021

INCOME		EXPENDITURE
$ 838.20	Raffles	$ 421.97
1,716.00	Trading Table	1,464.17
885.00	NEBS Subscriptions	0.00
390.00	BCSA Fees	420.00
1,908.00	Rings	1,725.00
328.00	Shows/Show Lunches	582.87
0.00	Sundries	852.96
28.50	Postage/Secretarial Expenses	701.26
355.00	XMAS & Social Functions	164.00
2.00	Donations	0.00
0.00	Trailer Reg. & Ins./Affiliation Fees	472.00
295.85	Interest Bank Accounts/Incentive Saver	0.00
130.00	Canteen/BCSA Lunches	0.00
0.00	Hall Rent	600.00
306.40	Tender Sale	0.00
$ 7,182.95	TOTALS	$ 7,404.23
-221.28	EXPENDITURE OVER INCOME	
$ 7,404.23	FINAL TOTALS	$ 7,404.23

Audited & found correct (by records produced) by Auditor. Northeast Budgerigar Society Inc.

BALANCES OF BANK ACCOUNTS AS AT 30TH JUNE, 2021

BALANCE OF CHEQUE ACCOUNT AS AT 30TH JUNE, 2020	$ 3,608.46	
Plus Incomes 2020/2021 (Does not incl. Interest from Incent. Saver)	7,144.16	
TOTAL	$ 10,752.62	
Less Expenditure 2020/2021 (Does not incl. Transfers to Incent. Saver)	7,404.23	
Less money transferred to Incentive Saver	500.00	BALANCE
OF CHEQUE ACCOUNT AS AT 30TH JUNE, 2021	$ 2,848.39	
BALANCE OF INCENTIVE SAVER ACCOUNT AT 30TH JUNE, 2020	$ 6,725.68	
Plus Deposits transferred from Cheque Account	500.00	
Plus Interest received for 2020/2021	38.79	
BALANCE OF INCENTIVE SAVER ACCOUNT AS AT 30TH JUNE, 2021	$ 7,264.47	
BALANCE OF TERM DEPOSIT AS AT 30TH JUNE, 2020	$ 12,500.00	

Interest transferred to Cheque Account	256.95
BALANCE OF TERM DEPOSIT AS AT 30TH JUNE, 2021	$ 12,500.00

CHEQUE ACCOUNT BALANCES AS AT 30TH JUNE, 2021	$ 2,848.39
INCENTIVE SAVER ACCOUNT BALANCES AS AT 30TH JUNE, 2021	$ 7,264.47
TERM DEPOSIT BALANCE AS AT 30TH JUNE, 2021	$ 12,500.00
TOTAL BANK BALANCES AS AT 30TH JUNE, 2021	$ 22,612.86

TOTAL BANK FUNDS AS AT 30TH JUNE, 2021	$ 22,612.86
TOTAL BANK FUNDS AS AT 30TH JUNE, 2020	22,834.14
NET LOSS AS AT 30TH JUNE, 2021	$ - 221.28

CHEQUES OUTSTANDING	EST. VALUE OF ASSETS 30TH JUNE, 2021		
Nil	PA System		$ 400.00
	Trailer	2,300.00	
	Projector/Laminator	700.00	
	Bond for Hall		100.00
	Staging	2,000.00	
	Cutlery/Brooms/Drinks		140.00
	Cash Floats on Hand		64.00
	Trading Table Stock		802.00
	TOTAL EST. VALUE	$6,416.00	

Audited & found correct (by records produced) by Auditor.
NORTHEAST BUDGERIGAR SOCIETY INC.

BCSA ANNUAL REPORTS 2020- 2021

Ring Officers Report 2021

A total of 10450 rings were ordered this year compared to 9800 last year (both include subsequent orders) by South Australian fanciers. As per previous years, no issues have been reported and ring quality is again of a high standard although it is well reported substantially tougher than rings of the past and as advised last year one needs a ring cutter of quality to remove any rings that do need removing. Pricing has also been set for 2022 by the ANBC remaining unchanged at 50 cents per unit with a minimum order of 25 or units thereof.

Nigel Tonkin State Ring Officer.
28.06.21

Presidents Report 2021

Just when we thought this insidious COVID 19 Pandemic was under control we now find ourselves again impacted by another wave of outbreaks in recent weeks.

Shows were unfortunately non-events in 2020 due to these same restrictions. Things were just returning to some form of normality with shows and meetings back on the Agenda for members.

This event has effected many things from nightly meetings right up to the cancellation of the National event in 2020 in Victoria and then that further cancellation again in 2021. Unfortunately, the timing to a reasonable return to “normal” is still considered a long way off.

To their credit all Clubs have rearranged their method of communication to members and are to be applauded for those implemented changes to keep members involved.

“The actual activities and limited participation by members continues to be a major concern given those few current active members are now being impacted by age and physical abilities. I fully understand we are involved in a hobby with diminishing membership however greater participation by the existing membership is not now just a requirement but an imperative to our ongoing existence and once involved the benefits of participation will be well accepted by others and that individual involvement usually expands one’s interest in the hobby overall”.

The previous paragraph is an extract from the 2020 report and I have retained to again reiterate the need for participation by members. In 2022 this Council will host the ANBC Championship show and the need for stronger participation by many more members will be paramount to effectively host this most prestigious events on the entire Budgerigar calendar.

Our web page has now been upgraded and that will make usage and access to current material better for individual members and I would like to thank Ruth Lange for agreeing to monitor and retain the site.

To the dedicated crew that run the Auction also thanks from the from the Council and members as without their help this event would surely falter.

I would like to thank all Delegates and past Delegates for their actions during the year which has passed with some enthusiastic debate with final decisions being amicably accepted by all.

Peter Glassenbury
President BCSA
29/6/21

Budgerigar Council of South Australia Inc. Financial Accounts to Jun 30, 2021

Operating Account

Date	Details	Deposits	Expenses	Balance
1/07/2020	Operating account			$ 8,734.69
	Club Affiliations 2021	$ 300.00		
	Auction / Show Raffles	$ 111.00		
	Memberships 2020	$ 45.00		
	Memberships 2021	$ 2,880.00		
	Ring Sales 2020	$ 62.50		
	Ring Sales 2021	$ 3,600.00		
	Show entry fee 2021	$ 277.00		
	Interest Term Deposit	$ 537.61		
	Return hall bond/key dep	$ 385.00		
	Return hall booking	$ 349.50		
	Transfer from Term Dep	$ 5,000.00		
	Total Income for Year	**$ 13,547.61**		**$ 22,282.30**
	2020 Rings (Supp)		$ 747.25	
	2021 Rings		$ 4,802.00	
	ANBC Affiliation 2021-22		$ 300.00	
	Bank Charges		$ 8.55	
	UBBSA Affiliation 20/21		$ 10.00	
	Logan Show Exp 2021		$ 344.70	
	Hall Hire 2021		$ 168.75	
	Hall Bond/Key Deposit		$ 385.00	
	Public Liab Insurance 2020		$ 75.00	
	Web site		$ 1,074.00	
	Transfer to Term Deposit		$ 5,000.00	
	Transfer to National Show Account		$ 5,000.00	
	Total Expenses for Year		**$ 17,915.25**	
	Expected Balance from all of the above transactions			**$ 4,367.05**
30/06/2021	Actual Balance as per Operating Statement			**$ 4,367.05**
	Less unpresented cheques (0)			
	Net Balance operating statement			**$ 4,367.05**
National Show Operating Account				
	Transfer from Operating Account			**$5,000**
	Bank charges		$ 5.00	
	Net Balance National Show Account			**$4,995**
Term Deposit at 1/07/2021				**$ 54,697.74**
	Transfer from Operating Account			**$5,000.00**
	Transfer to Operating Account			**$5,000.00**
	Total Term Deposit at 1/07/2021			**$ 54,697.74**
	Total Funds of BCSA as at 30/06/2021			**$ 64,059.79**

Original Signed
Treasurer BCSA - John Mulley
Original Signed
Auditor - Bob Deverson

Minutes of the North East Budgerigar Society General Meeting

HELD: Kilburn Hall, 49 Le Hunte St. Kilburn on Wednesday June 9, 2021, 7.30pm
Normal proceedings suspended for the night to enable priority to be given to the bird sale. The club extends a welcome to visitors present tonight. If anyone has not checked in with the QR code or filled in their contact details at the entry point please attend to that. Covid Marshall present.

JUST A FEW ANNOUNCEMENTS:

1. The June magazine for members who receive hard copy is available out the front.
2. The Trading Table will close early so that effort can focus on the bird sale, so please make any purchases from the Trading Table first.
3. Raffle will be drawn before we call time on the bird sale.
4. Show schedules are on the table, but remember entries need to be in by Friday.
5. Procedure for bird sale is as follows:

- Starting price – breeder's choice as written on the cage. Spare biros are available for anyone who forgot to bring one
- Minimum increment is $5 but not restricted to $5 if you really want the bird
- About 10 minutes notice will be given before calling time
- Time will be called without notice when we see no buyer activity
- Anyone who writes a bid down after time is called will be crossed off the bidder list
- Seller is to sign and write paid on the tender form when their money is collected
- Seller is to move the bird from their cage to the buyer's cage
- Tables will be placed in front of the staging to facilitate transfer of birds
- Any bird not attracting a bid can be sold at any negotiated price after time is called
- Get started! Do not forget to buy some raffle tickets.

BIRD SALE GETS UNDERWAY for about half an hour.

6. RAFFLE: Marcus Strudwicke, Ashley Smith and Brody Sloper.
7. REMINDERS: Remember to pick up your club magazines if you do not receive them electronically
8. NEXT MEETING: Wednesday July 14. Entertainment will be a presentation on discovery of the Colour gene in budgerigars and its Blue mutation. Bird of the Night will be Clearbody.

Bird sale was terminated at about 8.30pm when buyer activity ceased.

Graeme Alchin, President

Minutes of the North East Budgerigar Society General Meeting

Minutes of the North East Budgerigar Society General Meeting

HELD: Kilburn Hall, 49 Le Hunte St. Kilburn on Wednesday July 14, 2021, at 7.30pm
WELCOME: President Graeme Alchin opened the meeting. Please ensure that you have filled in the attendance register or registered using the hall QR code. Duty COVID Marshall for tonight: Dennis Lomman. APOLOGIES: Michael Smith, Bill and Kate Davis, Sue Adams, Lloyd and Helen Edwards, Bette and Brian Marshall. NUMBER ATTENDING: 12
MINUTES OF PREVIOUS MEETING: Taken as read; BUSINESS FROM PREV MINUTES: Nil
CORRESPONDENCE: BCSA AGM agenda received and distributed. BCSA auction catalogue received and distributed. June Newsletter from UBSSA.
TREASURER'S REPORT: Total club funds $22,612.86
RING OFFICER REPORT: Plenty of 2021 rings remain and orders with payment for 2022 personally coded rings are due by the end of August.
TRADING TABLE REPORT: Vicki gave a detailed description of all items on the Trading Table.
NEW MEMBERS: Michael Crossley and Travis Farrugia-Gay.
BCSA REPORT: BCSA auction (178 birds) and AGM is on Saturday July 17 at the Enfield Community Centre with viewing from 9.00am. Reminder that there will be no catering other than free coffee and $1.50 drinks.
ANNOUNCEMENTS AND GENERAL BUSINESS: Nomination forms for the Committee are on the table. Vacancies do exist on the Committee. Secretary has a show schedule and entry form for the budgerigar section of the Kadina show to be held Saturday August 21. For additional copies contact Malcolm Loveridge on 08 8825 3939.
ENTERTAINMENT: Presentation by John Mulley on discovery of the Colour gene and its Blue mutation in budgerigars, and how other mutations in this gene can explain the Golden Face, Yellow Face and White Cap colours.

NIGHT SHOW RESULTS: Thanks to Ian Marshall for judging the birds. Bird of the Night (Clearbody): No entries. Open: Best bird John Farrugia-Gay

JUDGES COMMENTS: Ian Marshall gave a detailed description of the birds entered.

NIGHT RAFFLE WINNERS: Alan Tenny, Garry Murphy, Travis Farrugia-Gay
ANY QUESTIONS FROM THE FLOOR ON ANY TOPIC RELATED TO BUDGERIGARS: Nil
NEXT MEETING: The next General Meeting to be held on Wednesday August 11 which will be the AGM and interview with a veteran breeder.

REMINDERS: Please consider nominating for Committee positions. Nomination forms are by the door.

MEETING CLOSED: 8.45pm

Graeme Alchin, Chairperson

THE NORTH EAST BUDGERIGAR SOCIETY HONOURS AND AWARDS …….IN THE BCSA ERA

NATIONAL CLASS WINNERS WHO REPRESENTED NEBS IN THE LOGAN SHIELD

1996	Helen Brooks	Fallow	Cairns
1997	Rob McKie	Opaline	Melbourne
2000	John Mulley	Opaline AOSV	Adelaide
2001	M & R Rafferty	Opaline AOSV	Freemantle
2002	S & C Norris	Dominant Pied	Hobart
2003	John Mulley	Blackeyed Self	Cairns
2007	Marshall Family	Albino	Adelaide
2009	Peter Glassenbury	Blackeyed Self	Burnie
2014	Dennis Lomman	Normal Violet	Adelaide
2014	Marshall Family	Recessive Pied	Adelaide
2014	D & R Lange	Crested	Adelaide
2018	Troy Holmes	Normal Grey Green	Penrith

NATIONAL JUDGING APPOINTMENTS WHILE A NEBS MEMBER

1994, Malcolm Loveridge, Perth.

1999, Shiralee Reardon, Gold Coast; 2000, Peter Glassenbury and Nigel Tonkin,

Adelaide; 2002, Malcolm Loveridge, Hobart, 2003, Peter Glassenbury, Cairns.

2007, Nigel Tonkin and Peter Glassenbury, Adelaide; 2008, Peter Glassenbury,

Busselton; 2010, Malcolm Loveridge, Rockhampton, 2012, Peter Glassenbury, Geelong.

2014, Nigel Tonkin, Adelaide, 2019, Peter Glassenbury, Brisbane

NATIONAL SHOW MANAGER WHILE A NEBS MEMBER

2000 & 2007, Bruce Stafford, Adelaide; 2010, Nigel Tonkin,

Rockhampton; 2014, Doug Lange, Adelaide

NEBS LIFE MEMBERS

Gordon Lowe (dec); Bob Hancock (dec); Betty Fisher (dec); John Fisher (dec); Arthur Harvey (dec); Coral Harvey(dec); Julie Kakoschke; Kelwyn Kakoschke; Brian Marshall; Bette Marshall; Bruce Stafford; Marion Stafford; Lloyd Edwards; John Mulley; Graham Bell; Helen Edwards; Lea Todd; Dennis Lomman

Please notify the Club Secretary if you know of any errors or omissions in the above