

## GENETIC INFLUENCES IN POULTRY BREEDING

There are many genetic qualities in all breeds of poultry where it may be considered desirable to improve, and the following example shows where just one of these can be used to improve the egg colour in chickens.

It is the cock bird has the major influence upon the colour of the eggs. For the past 30 years we have used the following practice in our Welsummer breeding policy to improve the egg colour and size, whilst not detracting from the major potential problems of inbreeding. The target has been to produce a strain that lays exceptionally dark brown eggs ranging in size from the smallest at around 72 grams to the largest at around 87 grams.

We have introduced new stock every 8 to 10 years, but have kept only the pullets from such introductions and then bred three successive generations from our own cock birds, thus resulting in a dominance of 87.5% of the original strain. We have found that such a policy maintains vigour and breeding qualities whilst not detracting from the egg colour/size results. From such introductions we then adopt the following breeding policy until such time as a new bloodline introduction might be beneficial:

From the first years breeding of this new 87.5% strain, the best two cocks and the best six hens are retained. From their offspring the best six pullets and the best two cockerels are retained. (To be on the safe side we usually in fact keep back three cockerels in the event that one decides to die).

At the commencement of the next season we start with two breeding pens, except in the years when raising a new bloodline when we have three pens going. Pen one will contain the six old hens and the two new cockerels, and pen

two will contain the six pullets and the two old cock birds. This breeding programme can be repeated each year for around eight to ten years before you may see indications of deterioration (usually a decline in fertility), at which point a new female bloodline needs to be introduced.

We have used this breeding programme largely for the improvement of the egg, by selecting only the very best in size and colour eggs for hatching, and ensuring that the cockerels and pullets from the very best of these are clearly marked (we usually use toe clipping), thus ensuring the best possible basic grounds for improvement. With this small number in each breeding flock it is possible to recognise the eggs from the different hens, thus allowing you to avoid breeding from any poor layers. This is successful for improvement of egg colour and size, but of course could be used for the improvement in other qualities in poultry that you may require.

The following chart shows the effect upon your flock from using your old bloodline of cock birds on successive generations of new and unrelated hens, but also clearly demonstrates the possibilities for many other breeding variations:

First Hatch	Old bloodline proportion	1/2	50%
Second hatch	“	3/4	75%
Third Hatch	“	7/8	87.5%
Fourth Hatch	“	15/16	93.75%
Fifth Hatch	“	31/32	96.87%
Sixth Hatch	“	63/64	98.437%
Seventh Hatch	“	127/128	99.21875%
Eight Hatch	“	255/256	99.615375%