

# Balanced breeding for a better performance

by Jim McAdam, R&D director, Aviagen Ltd, Edinburgh, Scotland.

Since the beginning of the modern broiler industry in the early 20th century the drive has been to increase performance in the economically important characteristics.

Developments in genetics, nutrition and management have allowed significant progress to be made and today it takes around 11.5kg less feed to produce a kilogram of boneless breast meat than it did 25 years ago. At the same time, average breeder performance has improved by about one egg per year (Fig. 3).

The primary breeding companies have responded to the market demands of producers around the world, steering the rate and focus of genetic change of their products to meet the different needs and priorities of the diverse global markets.

Their ability to gauge future market requirements and develop products with the right balance of breeder and broiler performance to deliver maximum economic advantage is critical to their success.

Thus, as markets mature and develop and the requirements of products change, there is a need to continuously review and update selection objectives to keep pace with changing industry demands.

Feedback from product performance in the field, understanding customer requirements and listening to industry groups provides the information on which the primary breeders can make broad changes in selection pressure for various traits.

For example the emphasis has swung from being solely on broiler performance until the late 1970s, onto FCR and breeder performance between the late 1970s and late 1980s and thereafter onto meat yield and processing traits (Figs. 2, 4 and 5).

However, genetic progress and the change of emphasis placed on each of

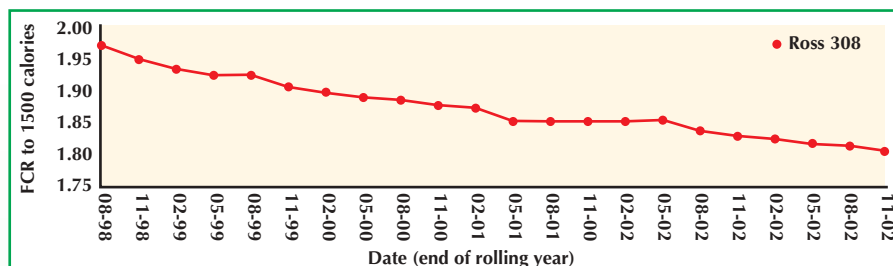


Fig. 2. Live production in the USA. Tray pack (5.0lb), adjusted FCR to 1,500 calories.

these measurable, economic performance traits has had to be balanced with progress being made in the support and welfare characteristics such as liveability, leg strength and cardiovascular fitness.

Without this, the result would have been an unacceptable deterioration in the

in production in the short term for the sake of sustained progress in the long term, is thus the sensible and balanced approach.

The data in Table 1 clearly show that while great progress has been made in production performance, there has been no deterioration in either liveability or processing condemnations. On the contrary, a slight improvement in both leads to the conclusion that the potential negative consequences of rapid progress in production traits can be overcome by a sensible balanced selection approach, allowing sustainable future progress to be made (Figs. 1 and 6).

Advances in technology have allowed for this more balanced approach in breeding programmes, enabling more accurate measurement and quantification and thus more accurate decision making.

For many years the Aviagen breeding programmes have utilised X-ray technology to improve skeletal leg strength and reduce the instance of tibial dyschondroplasia. This has meant that the incidence of leg issues in the field has been dramatically reduced without the need to adopt management practices such as lighting programmes to reduce late mortality and ensure the best possible financial return.

Cardiovascular fitness has also been a focus of the Aviagen programmes for some considerable time, through the use of oximeter technology. This technique, adapted from human medicine, allows the amount of oxygen carried in the blood to be measured and by assessing individuals in a population, enables geneticists to choose those birds most able to meet the oxygen demand of their growth rate, to be utilised in the breeding programme.

Other newer technologies have also been assessed and where appropriate are

Trait	Annual rate of improvement
Liveweight (g)	+30
FCR at 2.27kg	-0.03
Eviscerated yield (%)	+0.43
Breast meat yield (%)	+0.44
Broiler liveability (%)	+0.17
Plant condemnations (%)	-0.13
Breeder hatching eggs (%)	+0.75

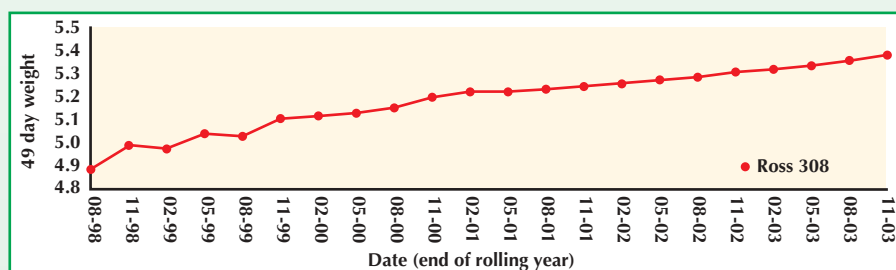
Table 1. Estimated annual rates of genetic gain between 1998 and 2003 based on information published by a major industry reporting service in the USA.

health and welfare of the bird, on top of the severe direct financial loss.

Thus primary breeders nowadays have to utilise all the selection methods and technologies available to them, to identify superior individuals in terms of production performance as well as to identify potential weaknesses in terms of the support and welfare traits.

Maintaining a balance between the two and foregoing maximising improvements

Fig. 1. Live production in the USA. Tray pack (5.0lb), 49 day weight.



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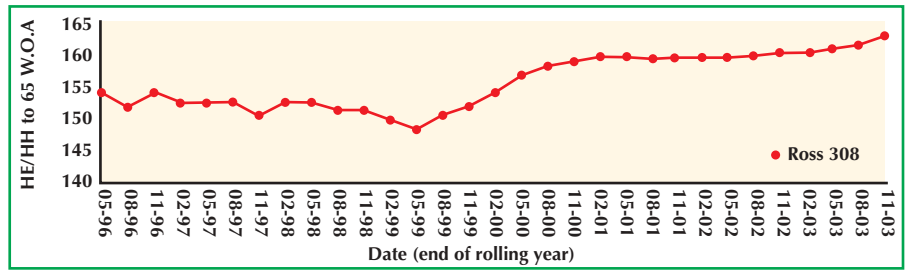


Fig. 3. Parent performance in the USA. Hatching eggs per hen housed to 65 weeks of age.

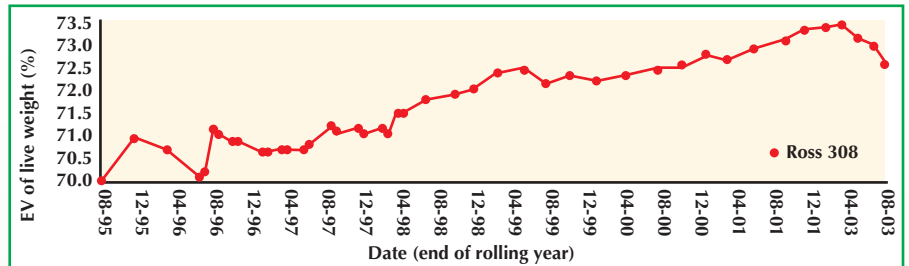


Fig. 4. Live production in the USA. Tray pack (5.0lb), % eviscerated yield.

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used to provide information and aid the geneticist's ability to make a more balanced selection decision.

One of Aviagen's key strengths is its multi-breeding programme strategy. Harnessing the information collected from the four pure line programmes around the world allows a much more balanced assessment to be made of how the same genotypes will perform in different environments and conditions of the global industry.

Coupled with this, closely monitoring performance in the wide range of environments experienced by products in the field and using the information gained in the decision making process, means that product robustness can be enhanced.

In the excellent pedigree environment, selection is focused on growing birds well, verifying growth rate, heart and lung

function and skeletal strength, while some of the more challenging environments provide information which helps identify families with strong immune systems which develop early and demonstrate an ability for robust growth.

The end result is a product more able to withstand and perform well in a wide range of environments and situations throughout the global industry.

Balanced breeding then is not just as simple as steering a line between the economic characteristics of breeder and broiler performance to meet the requirements of a particular market.

Much more, it encompasses the underlying support and welfare traits to ensure that whatever balance of breeder and broiler traits are inherent in the product, they can be maximised in the field across the wide range of global environments encountered. ■

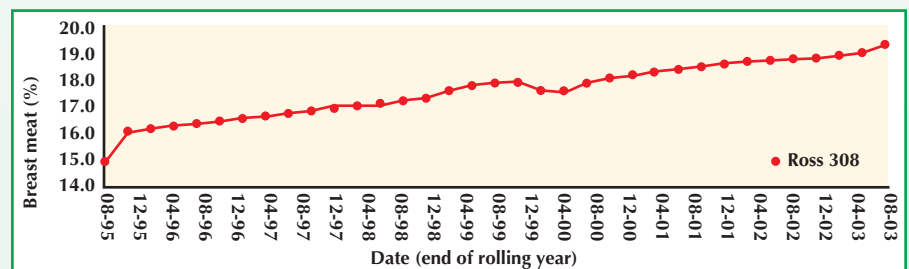


Fig. 5. Live production in the USA. Tray pack (5.0lb), % breast meat of live weight.

Fig. 6. Live production in the USA. Tray pack (5.0lb), % mortality and condemnations.

