DAFWA comments on AWI Industry Consultation Document

General

Genetic improvement, whether it is related to crops, trees or animals, is a key component of improved profitability of all farming systems. It is well known that genetic improvement has resulted in huge increases in the profitability of all farm animal species especially chickens, pigs and dairy cattle. DAFWA therefore strongly supports a genetic improvement scheme for cattle, sheep and goats. To this effect DAFWA has invested heavily during the past 50 years in infrastructure and staff to carry out genetic research and extending that information to industry. The genetic changes that have occurred over the years in sheep have resulted in significant benefits to industry across all production traits as was highlighted by Ramsey (2012) in her review on the economic benefits by using ASBVs in sheep breeding programs.

Benchmarking

DAFWA believes that a wide range of benchmarking tools should be generally available to the industry to benchmark different groups or individuals. The current benchmarking methodologies such as ewe and wether trials for commercial producers, bloodline performance, sire evaluation schemes and on farm progeny testing, highlight the differences that exist between different groups or individual animals and show what potential gains the lower performing groups can make by accessing genetically superior sources. The groups that will benefit most from using these technologies are the commercial producers. Both commercial and ram breeding groups already make huge investments to measure and record economically important wool and meat traits. By combining this information adds considerable value to the existing measurements. It is therefore crucial that a central institution in Australia be given responsibility to co-ordinate and to collect all benchmarking data. This data should be pooled and a combined analysis regularly carried out. The results should be made available to all commercial and ram breeding groups to allow them to identify genetically superior animals for their specific breeding programs. This can only be done by a central body funded by levy funds.

Genetic research

DAFWA is also of the opinion that continued genetic research is necessary to develop a world class evaluation system to identify genetically superior animals. The recent developments in genetic markers and DNA technologies offer huge advantages to the industry and continued research is necessary to capitalise on these developments. The impact of such research will have huge benefits and will result in significant costs savings. As the whole industry will benefit from such research it is important that industry levy funds be used to develop and fund new innovations.

The traits that will benefits most from molecular genetic research, are those traits that are difficult and expensive to measure on live animals such as reproduction rate, worm resistance, breech strike resistance and carcass traits. It is therefore important that research into improved technologies to identify genetically superior animals for these disease traits continues. It will have large impacts on labour costs and developing a robust and sustainable sheep industry.
Potential genetic benchmarking business models

The AWI Industry Consultation Document offers four different business models or a combination of models. DAFWA strongly supports a world class benchmarking system that serves the whole industry. Option 1 is DAFWA's preferred model but with further assistance to increase the adoption of breeding values by industry as follows.

Commercial producers

DAFWA supports the current system of funding a mixture of benchmarking tools and proposes implementing co-ordinating institution for bloodline comparisons, wether and ewe trials. Different management bodies co-ordinate and provide advice on benchmarking in general. The data should be combined and the results published in an easily accessible place. Such an infrastructure allows all sections of the industry to benchmark their sheep to determine where they lie relative to everybody else and where to access genetically superior animals. The commercial industry currently carries most of the costs while the costs to co-ordinating the activities are provided by AWI and MLA on a case by case basis.

These benchmarking infrastructures are powerful tools to demonstrate genetic differences between flocks. Having such a system will significantly benefit the adoption of ASBVs by commercial producers.

Rambreeders

The current Sheep Genetics system should be continued, improved and expanded. However, more technical assistance should be provided to improve data collection, analysis, listings of animals and to extract specific information from the national database.

Additional assistance is required to service the sheep industry better on how to interpret the results and how to use the results to best effect to genetically improve the national flock. Adoption of ASBVs is the key technology and more investment should be provided to assist in a national co-ordinated extension program, where the same technology and terminology is used. As ram breeders are the drivers of genetic change, working directly with breeders is the most effective way of generating genetic change. In this respect DAFWA has appointed a Development Officer at Katanning to carry out this task. However, additional assistance to breed associations should be considered to improve their breed by increasing adoption of modern breeding technologies.

Genetic research

Genetic research benefits all of the industry through the flow of genetically superior genes through a population from ram and semen sales. Thus research especially in developing genomic technologies to improve economically important traits that are difficult and expensive to measure, are important and should be continued.

In this regard breeding for resistance to disease such as worm and breech strike has much wider implications than only improving productivity. Genetic improvement in these traits generally results in a significant improvement in animal wellbeing. In addition it results in a reduction in the use of chemicals which contributes to a more sustainable sheep industry in the long term.
Feedback on specific items of interest as listed in the AWI Industry Consultation Document

Commercialisation

The normal use of this term relates to a fully user pays system. However, the local sheep industry does not have the infrastructure and necessary expertise in place to service the whole industry on a user-pay system. This relates specifically to extension activities to increase the adoption of modern breeding technologies.

Public and private good

This definition is simplistic in its meaning for farmers. As farmers depend heavily on rain, they are far more prone to environmental and biosecurity disasters than ordinary manufacturers and businesses. Natural disasters can have devastating consequences for the public as a whole. In the case of farmers, it is difficult to separate private good from public good. If farmers are not profitable then they cannot implement structures and programs to improve public good programs through environmental improvements on their farms and through the supply chains.

Operational, extension development and research costs.

Operational

In this context it relates to management procedures to collect, store and submit data and other relevant information, and using the information appropriately to achieve the highest benefits.

Extension

Generating education material, delivering the information in a suitable format to improve greater awareness of the pros and cons of genetic improvement.

Development

Developing new tools and methods to genetically improve sheep.

Research

Investigating the inheritance of production traits and generating new tools, methods and procedures to identify genetically superior sheep with higher accuracy.

Impact of charging more per animal

Apart from the cost to submit data from an animal to the database, the measurement and labour costs to collect that information should also be considered in this issue. This may particularly be the case for smaller ram breeders as with all industries, the scale of the operation will impact on this decision. Large ram breeding flocks will have much lower measurement cost per animal than smaller ram breeders. Ram breeders may doubt whether the additional costs on top of their
normal labour and measurement costs, will justify the returns. If they perceived it not to be the case then this may result in a decrease in members submitting data. This may have an impact on genetic gain, through lower numbers tested, poorer genetic linkage across flocks, and when Genomic Breeding Values are generally accepted, then the poorer or no linkage will imply that GEBV predictions for those flocks that are not linked to a reference flock, will be less accurate, which will further deteriorate over time. If the data processing costs are too high then the system will start to bleed as members drop out. This will have a significant negative genetic effect over time.

Influence of funding investments by different institutions on Merino AI and sale ram market

For the AI industry to flourish and to disseminate semen or embryos of genetically superior animals, it is imperative that good information on the genetic worth of animals is available. Sheep Genetics currently provides the most accurate information through ASBVs. If this information is not available then breeders will largely buy semen of unknown quality. This will have a significant negative effect on genetic improvement if this information is not available.

Benefits of different benchmarking systems for commercial flocks

As indicated in the first part of this report, benchmarking is a key tool in creating awareness of the value of genetic differences between animals. Commercial farmers pay high value to the outcome of wether, ewe and sire progeny test trials and many have change in how they buy rams. Efforts should be made to combine the information from these different sources to improve accuracy of identifying genetic superior ram sources. These benchmarking activities generally lead commercial ram buyers towards Merinoselect where the best information is available. Once they know and understand the value of this source, then they use this information to find rams that suits their breeding objectives much more accurately to the benefit of the whole industry.

Financial incentives for Merino stud breeders to adopt benchmarking

Objective information on this topic is not generally available but anecdotal information indicates that ram breeders whose commercial clients have performed well in ewe and wether trials have consistently benefited financially by selling more rams. Similarly ram breeders that have demonstrated that a ram or rams from their stud have performed well in sire evaluation, have consistently been able to sell more progeny or semen of that ram.

What rates of genetic gain are achieved in stud and commercial flocks by those who have and have not adopted genetic benchmarking?

This is a difficult question as no direct comparison had been made. The selection demonstration flocks carried out by South Australian Research and Development Institute (SARDI) compared different breeding strategies. However, it is unknown how much attention was given to ASBVs in identifying superior rams by the traditional groups. The attached paper by Greeff and Cox (2006) published the genetic changes that would have occurred in a commercial flock if commercial producers have bought average rams from 12 different ram breeding flocks over a 10 year period. The results showed that no consistent genetic changes occurred over this time, while four performance breeders have shown genetic improvements over a five year period. A followed up
study based on ASBVs has shown consistent genetic improvements for breeding programs focusing on wool and meat against an unselected control line.

Is option 4 or something similar inevitable?

Although option 1 is basically the current model, it appears that option 4 model is already working to some extent as breeders already pay a large proportion of operational and management expenses. This option can work provided adequate seed money is provided and a review of progress is made to assess the adoption of ASBVs. This however, is ultimately a decision ram breeders should make as the costs will impact on them directly.

Keeping Option 1 or 2, what should be changed?

The current system has a strong technical focus which is important as this is the foundation to provide accurate information to breeders. However, there is a need to provide additional advisory assistance to setup a performance based system, and to interpret the results to select the best animals for a specific breeding objective. The current team at Sheep Genetics is too small to service the local industry and more efforts should be made to incorporate Breeding Societies to play a part in collecting data, submitting data, and educating their members in the adoption of the technology to improve their breed. Seed money should be provided to Breed Societies and a more business approach with a profit motive, similar like the sporting clubs, should be pursued.

Should R&D in Sheep Genetics be paid for by current users or all levy payers?

It is generally recognised that there is huge benefits where every producer pays levies and where these funds are pooled and invested in R&D program to the benefit of the society as a whole. All tax systems work on this principle. The question that arises is the issue of private versus public good. As mentioned earlier this is difficult for farmers in that if they are not profitable (private good) then they cannot fund investments that will benefit the environment (public good). These issues are linked and therefore Genetic R&D should be paid for by all levy payers as all will eventually benefit from the outcome of the research as the genes flow through populations over time.

Has the technical and economic case for breeding values been adequately articulated?

Genetic improvement is a continuous process. It takes time and producers come and go. Therefore continuous education programs should be carried out to continuously inform beginners as well as having sophisticated programs for advanced users. Having a single body responsible for this is the best option to provide continued support, assistance and education program to prevent any misunderstandings and interpretation of the results.

Are ram breeders financially rewarded for genetic gain?
Ram breeders are certainly rewarded for genetic gain through ram and semen sales. However it depends on how much are the financial rewards for investing in breeding programs using sophisticated genetic technologies. This will differ between breeders and also depending on their advertising and marketing programs. The limitation of adopting breeding programs is the high cost of recording and measuring traits. If this was cheaper and less labour intensive tools were available then perhaps more breeders will measure their sheep.

Would service to breeders be materially improved under option 4 or something similar compared to option 1 and 2?

Not necessarily. The current system operates fairly well but can be improved by better client services. Option 4 basically will provide the same services but at a higher cost. It is highly unlikely that Option 4 will attract more clients and provide better services if higher costs are incurred by breeders.

Is there an alternative business model or interim model that better combines the advantages and minimises the limitations of the business models lists in this document?

The current Option 1 appears to deliver a very good service although personal services to individual breeders can be improved. It appears to us that there is a general lack of extension services which impacts on the adoption of the technology. What is seriously needed is a one-on-one service where the breeder pays for extra specialised advice above a “standard generic” level. As each Breed Society has direct responsibility for the genetic improvement of their breed, incorporating Breed Societies in delivering this service may be a way of overcoming this limitation.

Dr Johan Greeff
Leader and Senior Research Officer in Sheep Genetics
Livestock Industries

Dr Bruce Mullan
Director
Livestock Industries Innovation

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