

THE DOHNE IN AUSTRALIA

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SUMMARY

The Dohne (Merino) has provided Australian and overseas sheep producers access to sheep that are highly profitable, have and will continue to improve their productivity (Figure 1), and rams that can be selected easily and accurately relative to a breeder's objective.

Due to the great foresight by the Australian Dohne Breeders Association (ADBA) steering committee, a huge amount of training and promotion, ongoing development of the breeding system, as well as the very effective application by breeders and service providers the Dohne has thrived in Australia with approximately 20% of Australian commercial breeding ewes likely to be Dohne or their crosses with Merino. Flexibility of the breeding (including marketing) system has maintained cost effective genetic gain however, large challenges and opportunities continue and cooperation between all involved, a cornerstone of the Dohne, must be maintained. Change is an imperative, it is not an option.

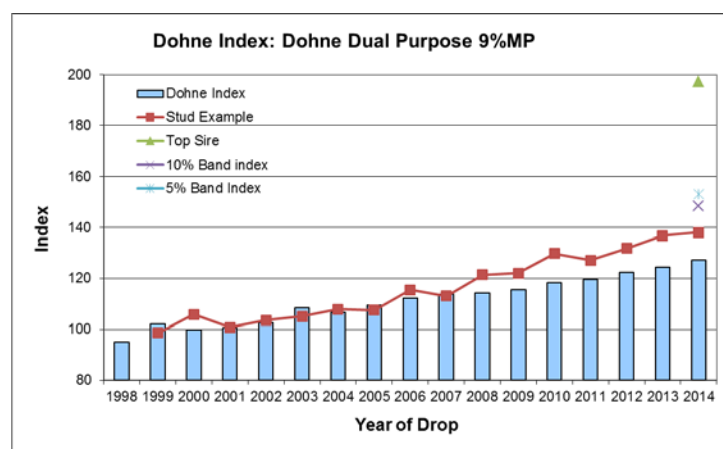


Figure 1. ABA genetic progress relative to a commercial production index.

INTRODUCTION

In the late 1990s, Merino commercial sheep producers in Australia were experiencing a significant change in the market place to one that provided them with less return for wool relative to meat. Fortuitously for Australian sheep breeders the Republic of South Africa (RSA) had been experiencing the same market forces for more than a decade and a group of RSA commercially driven Merino breeders had responded to this market by breeding a type of Merino known as the Dohne Merino that had a production balance to match this market.

Australian breeders recognized the opportunity that the Dohne Merino (Dohnes as they would be known in Australia) provided them to meet the changing market and in 1998 they began

to import pure bred Dohne embryos. Cameron McMaster's book '*Birth of a breed. The Dohne Merino Story*' (McMaster, 2015) outlines the Australian discovery, importation and development of the Dohne, in particular Chapters 25 and 33. Cameron's '*Birth of a breed*' is a comprehensive history of the first 75 years of the Dohne after beginning of their development in 1939. The authors of this paper would like to sincerely acknowledge the many sections of the book that have been incorporated into the paper and highly recommend the book to obtain both the detail and just as importantly the story of the people who were the driving force behind the Dohne.

Due to limits on length, this paper will largely not name individuals, however the authors would like to stress that, like in South Africa, it has been the people associated with the development of the Dohne in Australia who should feel a great sense of pride in the breed's achievements. In particular, these achievements include;

- All Dohne ram buyers have the best and easiest to use independent selection information.
- Genetic productivity is continuously and rapidly improving – the 2014 drop was 30 index points more commercially productive than in the first Australian drop (Figure 1).
- A breeding system is in place to allow genetic gain to continue and at an increasing rate.
- The Dohne has had a significant influence on approximately 20% of Australian breeding ewes.

The Australian Dohne Breeders Association (ADBA). The history of Dohne sheep in Australia is very closely defined by the Dohne breed association, known as the Australian Dohne Breeders' Association (ADBA) and its ram breeding members. The ADBA has worked very effectively to promote the breed and provide service to both its ram breeding members and commercial producers.

Passionate breeders with a long term vision, not entrepreneurs, were responsible for introducing the Dohne from the RSA. In 1999, the year after the first Dohne genetics were imported, these breeders quickly formed and maintained the ADBA because they had a long term vision and understood that a single and united group of breeders could achieve so much more. A good number of these breeders had a strong understanding of the conduct of a breed association therefore the passion very quickly and effectively translated into productive action. In addition, the breeders who formed the ADBA were blessed with the support of the South African Dohne Merino Breed Society (DMBS) that provided valuable direction.

Another critical factor was the establishment and maintenance of a comprehensive across- flock performance evaluation system by the ADBA. The system was very influential in uniting breeders as it allowed new and smaller breeders the opportunity to demonstrate the true breeding value of their sheep and gave them a valuable and unique service to market to their clients.

In November 1999, a steering committee to assist the Dohne's development in Australia was formed and had its first meeting. The committee's major aim was to develop a progressive breed association that had a broad industry representation and a co-operative approach to breed development, education and promotion. The committee also had as a priority to continue the DMBS breeding objective and breeding system. It was however decided at that meeting to take a significant leap forward and base the Australian breeding system on across-flock breeding values – Estimated Breeding Values (EBVs) as they were known at the time. The ADBA bylaws included comprehensive requirements for compulsory recording of full pedigree and performance for all registered sheep. It was a requirement that the Dohne EBV performance and the inspection grade of all registered sheep would be public and it was compulsory for them to be reported at the point of sale. In October 2000, the steering committee conducted the inaugural meeting of the ADBA Limited at Katanning in Western Australia where the constitution and bylaws it proposed became the Associations base.

In the first year after the establishment of the ADBA two manuals were produced, the Dohne Ram Breeders' Manual and the Flock Breeders' Manual. The first editions of the

two manuals were released within a little over 12 months during the 2002 series of workshops. Ram breeders worked cooperatively to conduct ongoing workshops to develop ram breeders understanding and skills and promote the Dohne to commercial breeders.

Growth of the ADBA and as a result commercial flocks. Membership of the ADBA grew rapidly, with 35 registered Dohne ram breeders (studs) by the second Annual General Meeting. By April 2002, the number of studs had risen to 51, with members in all mainland states in Australia. Numbers continued to rise rapidly and by June 2004 there were 100 studs with a corresponding rise in the number of pure bred stud Dohne sheep being bred (Figure 2) and sold by these flocks. In 2005, there were 152 stud members and in 2015 this had consolidated to 81 studs.

As well as pure registered Dohne sheep (introduced to Australia via embryos) Dohne sheep could be bred up from registered Dohne rams mated to Dohne like Merino ewes, a strategy known as a Foundation Flock and later in 2013 and additional system known as a Nucleus Flock.

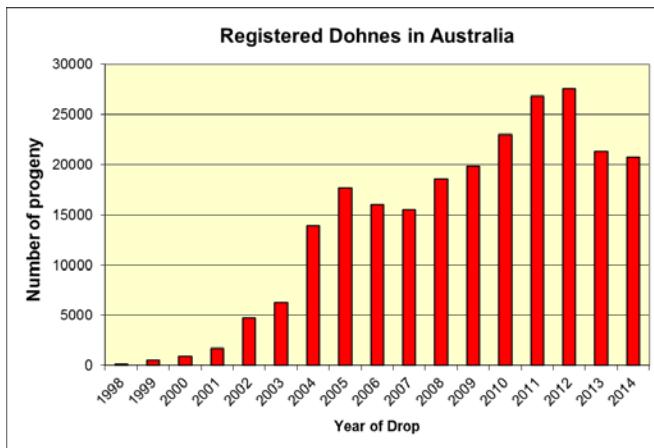


Figure 2. Number of sheep bred in registered ADBA ram breeding (stud) flocks.

The development of ram breeding flocks. In the period from 1998 to 2002 Dohne development centred on the establishment of studs that had the capacity to meet the demand for genetic material for newly emerging studs, as well as commercial flock rams. EBVs and index values allowed ram breeders to assess the performance and genetic progress of their flock and other studs in Australia and ADBA studs overseas, and to breed and purchase the most relevant sheep. During that time the number of pure bred sheep were increasing at a rapid rate with many studs continually undertaking embryo transfer programs to meet buyer demand.

Sale prices and clearances in the early sales were a good indication of the interest shown by both new studs establishing flocks and commercial flock breeders taking the remainder of the catalogue at prices far in excess of normal wool sheep ram prices. While these phenomenal prices were not maintained over the following years, they served as a strong incentive for Dohne breeders to increase the supply of rams. As the supply grew to meet the demand, prices eased to a more realistic level. The speed and professionalism with which the ADBA was established put the Dohne on a solid base.

While the number of Dohne stud flocks had fallen previously it was not until the 2013 and 2014 drops that the number of stud sheep bred fell from its peak in the 2012 drop. This easing in numbers is understandable when it is taken into account that sheep numbers in Australia had been on a rapid downward trend ever since the time of importation of the first Dohnes. At that time (1997-98) the AWI, MLA Wool Production Forecasting Committee, estimated there were

120.1 million sheep in Australia. The Committee estimate that in 2014-15 this number had plummeted to 71.6 million sheep – a drop of 40%. While the number of rams required across the sheep industry has dropped by a similar proportion, the Dohne ram supply continued to increase due to demand.

The Dohne point of difference. For commercial sheep producers the increase in the value and stability of the price of meat relative to wool has been the major driver behind the uptake of Dohne sheep with their considered high lamb growth rates and reproductive performance. Low breech wrinkle, polled, self replacing, hardy and easy care all had a very positive influence.

While all these commercial influences remain very firmly in the market place many Merino studs have focused their breeding objectives (often with assistance from Dohne sires) on these traits and are now offering good performance in these areas. One only has to observe the change to polled Merinos in the last ten years to see that for Dohnes this attribute has changed from a major point of difference to being just like the great majority of Merino studs who now offer poll rams.

While lacking the apparel wool attributes of the Merino, self replacing Composite flocks have also dramatically increased in numbers over the last 10 years limiting another point of difference for breeders who wanted to breed a self replacing prime lamb dam.

The development of commercial flocks – 20% of Australian breeding ewes. Commercial Dohne flocks were established as soon as rams were available from the initial stud drops. Despite commercial production not being from purebred Dohne flocks the results were impressive. The higher reproduction performance of pure bred flocks was not yet being fully expressed. From 2002 onward, when greater numbers of flock rams became available, there was a rapid increase in commercial Dohnes, bred in most cases by using Dohne rams over Merino ewes. This extended to breeding-up to purebred Dohne flocks in order to capture all the breed's commercial advantages.

During training workshops and associated activities, Cameron McMaster observed the evidence from abattoirs, such as Q-lamb in WA and Southern Meats in NSW, clearly demonstrating that even F1 Dohne prime lambs fully met the requirements of the Australian export lamb market. This meant an assured lamb market could be achieved and confirmed the Dohne dual purpose advantage. The fact that this could be achieved in self-replacing Merino flocks, while at the same time maintaining high quality Merino wool, was seen as a major benefit in a sheep industry that was being paid for both meat and wool. Cameron's comments to breeders backed by his RSA case studies of profitability of Dohne flocks had a great deal of influence among commercial breeders.

The success of the Dohne in Australia should be judged by their contribution to commercial sheep production. To assist in understanding the influence of the Dohne we can look at the results of the tri-annual wool and sheep meat survey (AWI, MLA. 2014) conducted jointly by the Australian Wool Innovation and Meat & Livestock Australia. The most recent survey (June 2014) found approximately 20% of Australian commercial breeding ewes are likely to be Dohne or their crosses with Merino. This is a truly remarkable impact from a zero base in 2000 to only 15 years later having an influence on close to 20% of the Australian commercial breeding flock.

Ram breeder working together at a regional level. At the establishment of the ADBA there were two regions, the Western Australian region and the Eastern States region that originally included the states of Queensland, New South Wales, Victoria, South Australia and Tasmania. The first Dohne sheep were introduced into Australia by two Western Australian (WA) breeders – Alex Leach and Geoff Beeck. Effectively from that time on WA breeders have been industry leaders. This has not only been at the national level but also at a regional level. WA has continued to lead the way in working together at a regional level to develop and promote the Dohne breed. The WA region was established in July 2001. The establishment of a WA committee led to the first public auction sale of Dohne rams in Australia.

After the initial introduction of Dohnes into the Eastern States in late 1999, the establishment of registered studs progressed very quickly in New South Wales (NSW). Dohne ram breeding began in South Australia (SA) shortly after the establishment of the early studs in WA and NSW, however, more slowly in Victoria, with no registered studs listed until 2003. That same year the first Dohne stud was registered in Tasmania.

There have been many challenges and successes since the introduction of the Dohne to Australia that have been positively progressed by a cooperative approach. For examples:

Training for Assessors, ram breeders and commercial flock producers. Particularly in the first five years of Dohnes coming into Australia there was a great deal of assistance from South African breeders and the DMBS. This came primarily as assistance to source and transfer genetics to Australia. However, there was a great deal of additional assistance. This assistance was provided in many ways to individual breeders and the ADBA. Training workshops were a standout.

Henri Londt and Cameron McMaster made an immense contribution to training workshops for Assessors, ram breeders and commercial flock producers. Henri, Manager of the DMBS at the time, was invited in 1999 and again in 2000 to conduct the first two official training courses under the auspices of the developing ADBA. As a result of the training received during that trip, Bevan Taylor and Alan Clarke were appointed the first Dohne Assessors in Australia. Following an invitation by the ADBA Cameron McMaster presented a series of training workshops across Australia in April-May 2002. Cameron held several workshop series between 2002 and 2007.

It was a requirement of all registered ram breeders to attend and successfully complete a Ram Breeder Workshop. This requirement was to ensure ram breeders understood the commercial focus of the Dohne and how to conduct the required pedigree and performance evaluation, both for measured and visual traits, and in both theory and practice. However, the workshops were equally important in developing cooperation and camaraderie between breeders, and between breeders and associated service providers.

Commercial Breeder Workshops focused more on the commercial productivity of the Dohne; the Dohne type; the quality assurance system; selection using EBVs and indexes; and Dohne sheep displays. Professional training material was provided to all those who attended – overhead presentation slides and evaluations, and a hard copy manual, either a Ram Breeders' Manual or alternatively a Commercial Breeders' Manual.

A very important part of the workshops was to impart the Dohne Breed standards by means of practical demonstrations and repeated hands-on classing exercises. Cameron stressed the need for correct "type" to achieve optimum results. ADBA assessors (now called classers) and ADBA ram breeders were major contributors to plan, provide sheep, host and assist presentation.

Branding of wool from Dohne sheep. One of the biggest individual challenges that the cooperative approach faced was the decision by the Australian Wool Exchange (AWEX) in 2006 during a periodic review to make it a requirement for wool from Dohne sheep to be branded as Dohne and not as Merino. An immense amount of time and resources was given over to overcoming that decision by showing Dohne wool was equal quality to other Merino wool. By the time of the next review of the Code of Practice in 2012, wool from Australian Dohne sheep could again be branded the same as all other Merino wool. While this result was very gratifying it required a huge amount of resources that would have been used to advance many other pressing and productive matters that would have improved Dohne sheep and the sheep industry in general.

The Road Show. Following on from a meeting with state presidents in 2014, the ADBA Council embarked on the Road Show to talk face to face with as many of its stud members as possible via a minimum of one meeting in each mainland state. Major topics were establishing a Breed Development Officer, centralised funding, national promotion, and the NSW Government decision to close Advanced Breeding Services. Advanced Breeding Services had managed the Dohne pedigree and performance database and estimated breeding value analysis and reporting since Dohnes were introduced into Australia and members needed to be alerted to the changes that would be coming. The success of the Road Show in developing communications and understanding in such an efficient and effective way means it is likely there will be regular Road Shows in the future.

ADBA Life Members. Many, many breeders and service providers have made an outstanding contribution to the Dohne in Australia. A cooperative effort across all these people has been the reason why the Australia and subsequently the world have benefited from the great foresight and development of the Dohne in the RSA. While there have been many huge contributions four have been exceptional and have been recognised with ADBA Life Memberships. Firstly Sally Coddington and David Kain both exceptional ADBA presidents as well as giving so much more. In addition, service providers Cameron McMaster and Rob Martin receive their awards in 2015 for their outstanding contributions above and beyond the service they were engaged to carry out.

Export of Dohne genetics from Australia. Australia is now the major supplier of Dohne breeding material to the world. The worldwide interest in Dohne sheep has been a result of scientific articles, presentations and travel undertaken over the last two decades by South Africa, in particular Cameron McMaster and Henri Londt. This has been aided by promotion carried out by the ADBA, Australian and overseas breeders and their service providers. DMBS breeders would have benefited directly from this promotion had South Africa not incurred an outbreak of Foot and Mouth Disease in the early 2000s and therefore are not eligible to export to most countries of interest.

Australian breeders have been able to supply Dohne genetics to the world because in addition the important awareness provided, high quality Dohnes, excellent health status, meticulous pedigree and performance records and service providers to assist the required artificial breeding programs needed. As a result, Dohne genetics have been exported from Australia to many countries including New Zealand, Uruguay, Chile, Peru, Argentina, Falklands and Russia.

The ADBA across-flock evaluation system, along with skilled breeding, has assisted overseas ADBA flocks such as Tres Arboles in Uruguay to become a major supplier of genetics in South America. The ongoing input of the very experienced scientist, Roberto Cardellino, provided on the ground expertise and continuity needed to ensure the Dohne breeding system has been very effectively undertaken. Roberto and principal of the Tres Arboles flock, Daniel Rubio, visited Australia in 2006 and participated in an ADBA Ram Breeder Workshop where they were top performers in both theory and practical sections of the workshop. Roberto went on to be appointed

by the ADBA as a Dohne Assessor. Roberto's paper at this conference will I am sure, provide much more detail on the South American situation.

The Dohne breeding system in Australia. When the ADBA was being established, the steering committee took a huge step forward to ensure world best practice in breed association conduct. The ADBA aimed to maximise genetic improvement and provide the highest quality service firstly to its ram breeding members, but most importantly to their clients. The focus was on providing a quality assured standard of excellence to commercial sheep producers. The ADBA enshrined its breeding system into its constitution and bylaws to ensure this service would be maintained at the very highest level. The breeding system included the structure of stud flocks, pedigree and performance evaluation (both measured and visual), promotion and marketing. Cameron McMaster's *'Birth of a breed'* (chapter 33) and the Australian Dohne Ram Breeders Manual (Casey *et al.* 2011) has the detail of the entire system.

At the time the use of across-flock, full pedigree, performance evaluation was a very significant innovation for wool sheep. NSW Department of Primary Industries (NSW DPI) Dr Kevin Atkins and Dr Arthur Gilmur's great skills, aided by BVEST software (developed by Dr Gilmur) allowed NSW DPI's Advanced Breeding Services to conduct the management of the ADBA Dohne Database and data analysis. Due to the foresight of the steering committee, at the inception of the ADBA Australian Dohne across-flock EBVs and index values were already being reported as a component of a comprehensive Dohne breeding system. Critically as part of the system all registered Dohne sheep were required to be evaluated by an independent ADBA approved Assessor to ensure they meet the high Dohne standard for structural and wool quality traits.

In 2005, the 'Sheep Genetics' service was established and a national Merino across-flock evaluation service began. At the time, it was not possible for the Dohne Database to be included in this evaluation as there was no significant common genetics between the two databases. While the analysis was not moved to Sheep Genetics immediately the Dohne bylaws and language used was changed to the common industry format developed for Sheep Genetics. This also meant an almost seamless transfer when Sheep Genetics in June 2011 began to carry out the Dohne genetic analysis. The ADBA continued to own and maintain the database and also the quality assurance to ensure breeder's evaluations and data met the Dohne standard.

In 1999, the first index was developed to cater for the Australian Dohne production and market place and had an emphasis that reflected both the increasing meat values and the high premiums for fineness at the time with 40% emphasis on meat traits and 60% on wool traits. The second index was introduced in 2008 and reflected the trend to relative higher lamb prices and lower premiums for fineness with the emphasis on meat traits now 65%. The most recent index initiated in 2014 reflects the continued trend toward higher meat prices and effectively has all the emphasis on meat traits with only enough emphasis on wool traits to maintain production.

The Dohne in the future. While the Dohne in Australia has very much continued the commercial flock focus that underpinned Dohne development it has also adjusted to changing circumstances, just as has been done by the DMBS and indeed by other countries who have embraced the Dohne. Change is an imperative, it is not an option. If adjustments are not made the Dohne, that has embraced technology so effectively in the past, will miss opportunities such as those that will be provided by genomics and will fall by the wayside. Embracing change does not mean that practical considerations are ignored and that all breeders need to go down the same path. This is definitely not the case.

In the past, perhaps the biggest single leap of faith and perception was made by the ADBA steering committee to embrace across flock genetic evaluation. While this technology did allow for a great deal of variation in the evaluation process that could be used by ram breeders, the ADBA bylaws in the early years required the same approach by all studs. The requirements were

very comprehensive, strict and aimed to provide high quality breeding values across all flocks. Breeders had to meet all requirements to allow rams to be sold as registered Dohnes. In the circumstances of the time, this was an invaluable approach. The result was a very rapid increase in the number of Dohne breeders, very effective and rapid adoption of complex technology, and most importantly a high rate of genetic improvement across both measured and visual traits. All these outcomes could be used to market the Dohne and its ram breeding flocks as having high quality sheep with high quality independent information to assist client's ram selection.

As ram breeders became more experienced and technology improved it was possible to introduce flexibility (and reduce costs and compliance) without a significant reduction in the high standard of the individual breeder's data or the Dohne Database as a whole. Some of the flexibility came in the form of small variations, while others were not only large; they were in areas synonymous with the Dohne breeding system in Australia and the RSA. Perhaps the most iconic was the change in April 2013 away from five grades; AA, A, B, C and UR grades, to only three grades; R (Registered), C (Cull) and UR (Unregistered). Other changes included; allowing progeny to be culled and also naturally mated before their full evaluation, removal of the requirement for eye muscle and fat depth to be evaluated, introducing post weaning age evaluation of body weight and fleece traits; establishing a "Nucleus Flock" system to introduce new genes; using new technology to collect sire and dam pedigree; trialling a system to exhibit sheep: establishing three new Dohne Breeding objectives and the list continues.

The challenge for each ADBA Council is significant because such effort goes into making the system as effective as possible. Any change from the current system seems to indicate that either an error was made in the past or on the other hand the system is dropping in quality. Neither needs to be true. New technology, new market values, new market places all legitimately bring change. Yes, due diligence is critical however, decisions need to be made efficiently so as to achieve a timely advantage and not burn out those involved. In going through the change process it must always be remembered the other people involved are just as passionate about achieving the best outcome – they are not heretics, nor are they your enemies or the enemies of the Dohne. Listen and embrace them and be flexible.

Perhaps the biggest challenge that has to be considered is should the Dohne Database be amalgamated with the Merino database and report one standard of breeding values for all apparel wool sheep. The technical challenges are relatively minor, however the market challenges are huge and need to be made in one huge step. Figure 3 displays the performance of Dohne and Merino rams evaluated in Merino Central Test Sire Evaluation and reported in Merino Superior Sires (MSS) as Australian Sheep Breeding Values. It should be noted that the Dohne rams do not have on-farm records including reproduction in the analysis.

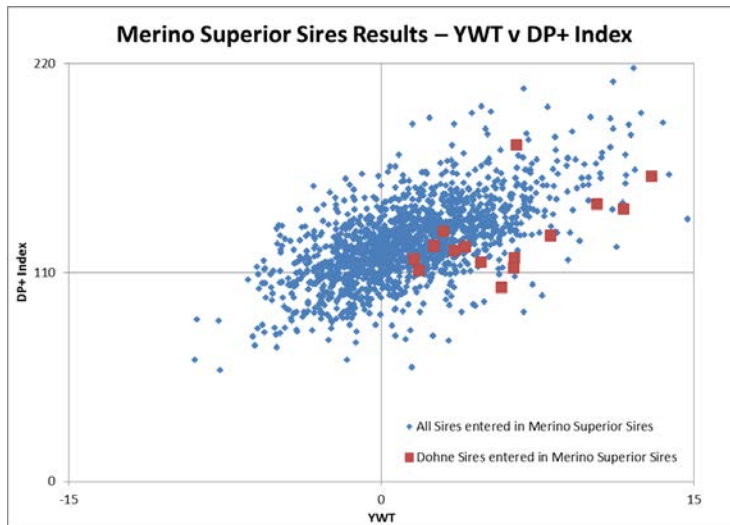


Figure 3. MSS sires performance – Merino Dual Purpose Plus (DP+) Index and Yearling Body Weight (YWT). Source: Australian Merino Sire Evaluation Association (AMSEA)

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