

RIDING ON THE ALPACA'S BACK . . .

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As we enter the twentieth year in the history of the Australian alpaca industry, one can only wonder what thoughts Macarthur and Marsden might have shared for the future of the Merino wool industry at the same stage. For them, that milestone passed at the turn of the 18th Century. Two hundred years later, at the turn of the twentieth century, the alpaca industry draws past the same milestone.

Observing the cyclical nature of history is an engaging pursuit. Both industries grew from the importation of exotic livestock from distant shores to a climate which many regarded as hostile to fleeced animals. Both began with foundation stock that included some of the best genetics then available from their own native countries, Spain and Peru. (It is generally accepted, though rarely committed to print, that some of the first alpacas imported into Australia were amongst the finest in Peru, selected from the very best which that country had to offer, and clandestinely shipped via Chile to Australia.) Both sought to establish a new agricultural enterprise based on the production of an exquisitely fine and soft natural fibre. Both aimed to improve on the high quality of the imported stock through selective breeding practices. And both began with a dearth of information and understanding about how these animals would fare in Australian conditions.

“The rest,” as they are wont to say, “is history.” In 1997, when the modern Australian alpaca industry celebrated its tenth birthday, the Merino sheep celebrated its bicentenary on Australian soil, having arrived from South Africa in 1797. Today, Australia is host to a massive wool industry, based on over 100 million sheep, and has long provided the international benchmark for quality fine wool. Our fledgling alpaca industry, on the other hand, boasts a mere 80,000 animals, and is still very much in the phase of fleece and market development.

How different this opening paragraph might have been, had not Charles Ledger's original 282 alpacas, imported from Peru and landed in Sydney in 1858, not foundered on political indecision and financial uncertainty!

The undoubted advantage held by the alpaca industry is the long history that is uniquely Australia's in breeding and developing the Australian Merino, a history that is as much about what has been written as it is about what has been learned and passed on between generations of Australians. To suggest that “wool is in our blood” is, perhaps, a little strong, but it is very much a part of Australian culture and history. And with it has come an understanding and appreciation of animal husbandry, nutrition, breeding, veterinary science, fibre science, and fibre research, as well as experience in processing, measuring and marketing natural fibre.

The modern alpaca industry in Australia has this wealth of accumulated experience upon which it may draw in furthering its fleece and animal development, and it is therefore no surprise that genetic progress has been so rapid in its early years. The coarse, low density, low yielding fleeces that were the norm in the early 90's are now

a rarity except in aged animals, and this has been reflected in a dramatic improvement in total fleece weights as well as a progressive improvement towards fineness, as confirmed by the annual fleece survey which has been conducted for many years by the Australian Alpaca Association.

But as well as a national experience and tradition in breeding fleeced animals, there have been other tools of critical importance available to the Australian alpaca industry in the 21st century, not known to Macarthur and his colleagues at the turn of the 18th century.

The first is the ability to objectively measure fleece fineness. It is no surprise that Australian research should have provided the world with the two most commonly used modern methods of accurately measuring fibre diameter. Both optical (OFDA, or Optical Fibre Diameter Analyser) and laser (Laserscan) devices are Australian inventions now used internationally to measure fleece fineness and a range of other fibre parameters. What *is* surprising is that both are relatively new devices, first introduced in only 1991, and their widespread use is a relatively recent phenomenon.

The second is the application of computer technology. Computers have insinuated their bits and bytes into every tiny crevice of modern society, and even the most ancient of domesticated animals has not escaped the touch of digital dominance. The use of the International Alpaca Register (IAR), the Australian-owned database which records the details of every registered alpaca in Australia and New Zealand, is just one example. The exploration, analysis and application of that database to breeding decisions is hugely beneficial to alpaca stud managers, through programs such as The Alpaca Breeders Toolkit[®], and is a powerful management tool for large and small breeders alike. Similarly, there are several commercially available herd management programmes to assist in the recording and tracking of individual herds, which are particularly valuable as average herd sizes increase. A further example is the collection and collation of fleece data for the national herd, a project undertaken for several years by the AAA, which documents a progressive annual improvement in objective fleece values. The internet, as a huge part of that computer technology, has meant that information is readily and instantly available, and that communication between breeders through email, noticeboards and websites, is as free and spontaneous as a simple conversation back in 1787.

A third is a new understanding of the science of fleece production, pioneered by scientists in a range of disciplines, and supported by ever-expanding technology. The SRS[®] Breeding System, refined by ex-CSIRO scientist and Australian researcher Dr Jim Watts, is an example of how an improved understanding of the skin physiology and microanatomy of fleeced animals can be applied to a breeding program, selecting genetically superior stock which produce progeny with finer, softer, and longer fibres that are more lustrous, more dense, and cut heavier and more valuable fleeces.

A fourth tool is a genetic improvement program, designed by and for alpaca breeders through the Australian Alpaca Association. The Across-herd Genetic Evaluation (AGE) programme is now into its second year, and is accumulating data from Australian and New Zealand breeders which will guide them in their breeding decisions by measuring the “potency” of different dams and sires in passing on desirable traits such as fleece weight and fineness. The data recorded results in the

allocation of scores, called alpaca breeding values (ABV's), for a range of traits (physiological, anatomical, commercial) which may then be applied to accelerate progress towards each breeder's own personal breeding goals.

A fifth, but by no means final, tool is the advent of advanced breeding technologies, which accelerate the propagation of genetically improved stock through methods of artificial insemination (AI) and embryo transfer (ET).

AI, commonly used in other livestock but not yet refined for alpacas, involves harvesting and storing semen from elite sires, and then transporting those samples to distant sites for artificial insemination into a wide range of receptive females. When eventually adapted for alpacas, AI will accelerate genetic improvement by facilitating the more widespread use of elite sires, as only the semen and not the sire will be required for the mating.

ET involves the natural insemination of an elite dam (donor) by an elite sire, followed by the flushing of the dam to retrieve the fertilised egg, and then immediate reimplantation of the egg by artificial means into the uterus of a prepared and receptive, but unrelated, female (recipient). The recipient then carries the pregnancy to term, delivers the cria, and raises it as her own. ET, already employed by several alpaca studs around the country, will allow the more rapid propagation of progeny from a selected coupling of a superior male with a superior female. Instead of a dam being limited to, say, 15 progeny in a lifetime, she may be the dam of as many alpacas as she has eggs which can be harvested over a lifetime.

Two techniques are employed: single egg ET, where a natural mating results in just one fertilised egg; and multiple ovulation ET (MOET), where drugs are used to induce many eggs to mature simultaneously in single female. These eggs are then fertilised naturally through a single mating, harvested by flushing in the usual manner, and each egg then reimplanted into a different receptive female. The preparation, timing, and performance of ET is demanding, exacting, time-consuming, and expensive, and the live cria yield remains an issue. Failure, where it occurs, is usually in the production of a fertilised egg from any given mating, or in the "stick rate" after reimplantation. The technology is still young, and improved harvest rates and stick rates can be expected when the factors determining which alpacas are most suited to this technology are better understood, and as preparation protocols are refined.

Macarthur. Marsden. Mort. What would they have thought, and what more might they have achieved?

It is therefore not difficult to understand why there is such underlying confidence and optimism in the Australian alpaca industry, a confidence reflected in the sustained level of investment being made by old and new breeders alike. There have been several purchases of stud sires in Australia at prices of over \$100,000, most recently the top price at the National Show and Sale (\$187,000 for the Supreme Champion, a white intermediate male, and the product of an embryo transfer programme) and the syndicated purchase of Prestige Valentino in May 2005 by Illawarra and Fire Mountain alpaca studs for \$123,000, now a part of their ET program. (A male alpaca recently sold in the USA for \$A800,000!). Prices for good and average stock remain much more reasonable, with pregnant females selling, usually, for between 5 and 20

thousand dollars, but higher prices are not uncommon for exceptional stock with strong pedigrees and advanced fleeces.

It is often said of alpacas that they are an animal that got lost looking for Australia. By that is meant that they are ideally suited to Australia, with their renowned hardiness in a wide range of climates, their efficient grazing habits and low nutritional requirements, and their gentle tread on fragile Australian soils. Add to that the successful history of fibre production in Australia, our understanding of fibre and selective breeding, the relatively clean and disease-free environment of Australian agriculture, and our experience and expertise in veterinary medicine and animal husbandry, and one can only lament that Australia did not find itself “riding on the alpaca’s back” 150 years ago.

In the meantime, it remains our joy and privilege to raise and nurture these enchanting animals, and to introduce to Australia a new agribusiness which is destined to provide export income for our country, jobs for our children, and solace for an increasing number of middle-aged Australians in search of an adventure, a lifestyle, and a sea-change.