

A comparison of livestock enterprises including self replacing herds of cleanskin sheep, merinos, goats and cattle

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The emergence of very large flocks of cleanskin sheep in pastoral Queensland and other states suggests private investors and former sheep people are convinced they are a viable option in environments that could be described as semi arid and best suited to new African meat sheep genotypes. The largest of these is a 60,000 ewe Damara flock near Warwick in the Traprock Tablelands about 200km west of the Gold Coast. How profitable are they? Could they again lift declining sheep numbers throughout Queensland and pastoral Australia? Most importantly can they raise prime lambs to slaughter weights from pastoral country to exploit their potential incomes?

It is therefore timely to see how nine self replacing livestock enterprises perform and to compare their gross margin differences. Breeds used include Cleanskin genotypes represented by “Dorper” composites. Also included are Boer goats, Woolled sheep genotypes, and Cattle. Three cleanskin joining systems currently adopted in pastoral Queensland are also compared. All comparisons except the continuous joined and double joined “Dorper” simulation are “like for like” and joined once only per year. The double joined Dorper enterprise is included to see the simulated effects of increasing conception and therefore weaning rates using accelerated lambing systems¹ to which the simulation appears to be extremely sensitive. The results are shown in Table 1 and Figure 1 which simplifies the gross margin /ha line of the ‘Results by Enterprise’ table.

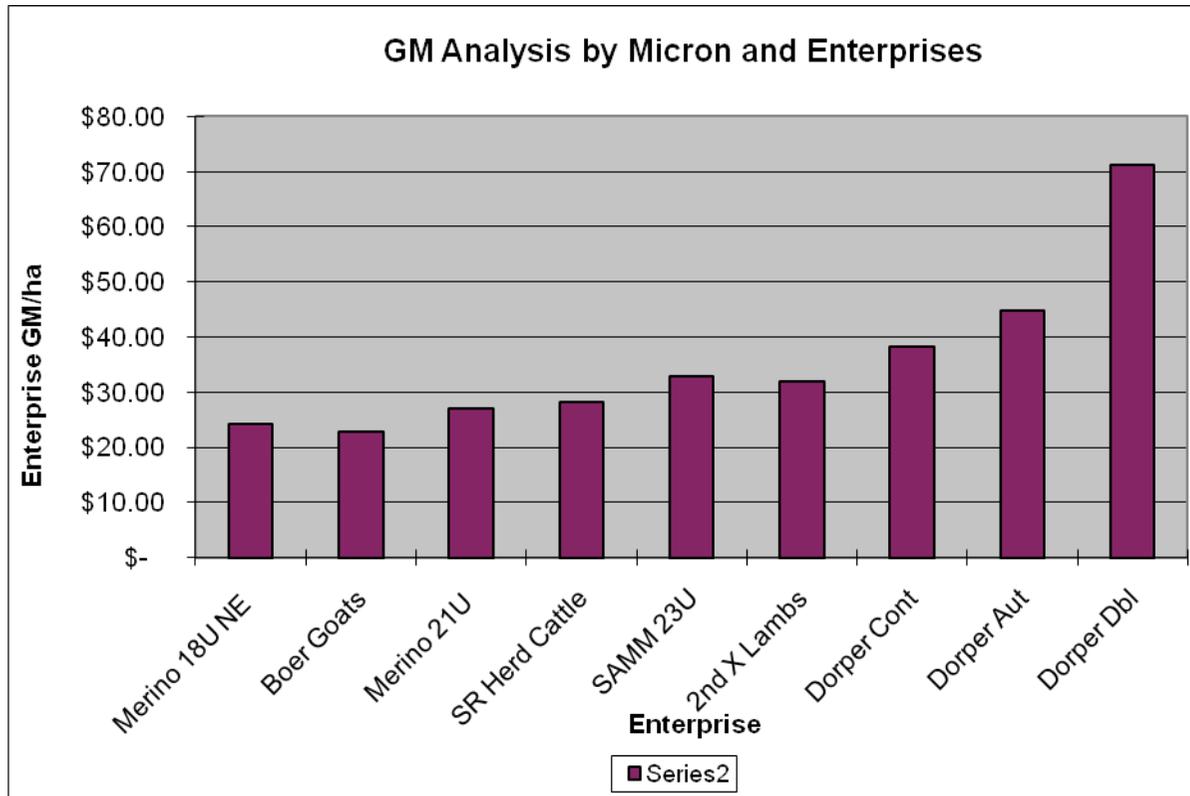
Only variable costs and incomes are compared in “like for like” gross margins unless otherwise stated. Feeding costs allocated to meat breeds have been doubled compared to wool breeds of sheep and none to goats. The Gross margin results should be considered as a best case scenario or “the upside” of all enterprises shown and it is always acknowledged that some individual performers in any enterprise are at least twice the average shown. That means there could be considerable downside with poor management in enterprises dependent upon sensitive parameters like conception rates. (Optional sentence).

¹ Accelerated systems for lambing can include joining ewes on 6 month cycles (twice a year once in autumn and again in spring) or 8 month cycles (3 times every two years) or continuously, to exploit increases in ovulation and conception rates. They may also include super ovulation techniques and feeding to support reproduction or reduce lamb losses. Feeding the joining and or lactation and lambing is costed in this simulation.

Table 1 A Simulation of livestock Enterprises comparing the gross margins of woolled and meat sheep, goats and cattle annually joined compared to two possible accelerated lambing systems.

RESULTS BY ENTERPRISES	Dorper Continuous join	Dorper Autumn join	Dorper Double Join	F1 Goats	Dohne 19U	SAMM 23U	Merino 18U	Merino 21U 5.0kg	Join cfa ewes only to Meat sires	All 1st X Merino Lambs	All 2nd X British Lambs	Purebred (F4) Damaras	SR Herd Weaner turnoff
Adult ewes shorn	1,000	1,000	1,000	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	100
Prime Lambs sold	883	1,050	1,532	1,029	765	815			256	900	795	883	79
NET WOOL SALES					\$34,687	\$22,138	\$31,940	\$29,089	\$26,263	\$19,301	\$7,392		
TOTAL SHEEP SALES	\$104,867	\$121,753	\$171,649	\$61,355	\$75,709	\$83,762	\$50,575	\$60,402	\$62,455	\$96,140	\$95,407	\$105,208	68891
TOTAL INCOME	\$104,867	\$121,753	\$171,649	\$61,355	\$110,395	\$105,899	\$82,515	\$89,491	\$88,718	\$115,442	\$102,799	\$105,208	68891
TOTAL VARIABLE COSTS	\$27,556	\$31,225	\$27,292	\$15,094	\$38,144	\$39,439	\$33,691	\$34,771	\$34,191	\$51,779	\$38,251	\$29,097	11898
VARIABLE COSTS/KG OF WOOL					\$5.05	\$6.06	\$5.34	\$4.19	\$4.19	\$8.16	\$14.86		\$0.41
V.C/EWE	\$27.56	\$31.22	\$27.29	\$15.09	\$38.14	\$39.44	\$33.69	\$34.77	\$34.19	\$51.78	\$38.25		\$118.98
GROSS MARGIN	\$77,311	\$90,528	\$144,357	\$46,261	\$72,251	\$66,460	\$48,824	\$54,720	\$54,526	\$63,662	\$64,547	\$76,111	\$56993
GROSS MARGIN/KG	\$	\$			\$9.56	10.22	\$7.74	\$6.59	\$7.21	\$10.03	\$25.08		\$1.95
GROSS MARGIN/EWE	77.31	90.53	\$144.36	\$46.26	\$72.25	66.46	\$48.82	\$54.72	\$54.53	\$63.66	\$64.55	\$76.11	\$569.93
GROSS MARGIN / DSE	28.21	32.63	\$37.46	\$18.34	\$24.56	22.59	\$16.60	\$20.81	\$21.28	\$25.63	\$23.27	\$27.44	\$23.10
GROSS MARGIN/HA	\$	\$											
GROSS MARGIN/\$100 GM/\$100 LIVESTOCK CAPITAL	38.19	44.72	\$71.31	\$22.86	\$35.69	32.83	\$24.12	\$27.03	\$26.94	\$31.45	\$31.89	\$37.60	\$28.15
	\$128.95	\$140.45	\$156.00	\$41.40	\$110.31	101.47	\$74.54	\$138.53	\$96.58	\$123.38	\$100.14	\$118.08	\$79.21

Fig 1 A Simulation of 9 selected Enterprises comparing the gross margins of woolled and meat sheep, goats and cattle annually joined compared to two possible accelerated lambing systems.



- The self replacing enterprises simulated are Merino fine wool 18 micron (New England rams), Boer goats, Merino strong wool of 21 micron, Self replacing Cattle herd, South African Meat Merino at 23 microns, a British Breed commercial flock (2nd X Lambs) and Dorper commercial flocks. The Dorper composite flock, the most ubiquitous (non shearing) cleanskin breed in Queensland, is represented in 3 different joining modes which significantly influence conception and therefore weaning and lamb slaughter rates.
- Wool Prices as at 26th Mar 2010 <http://livestock-wool.elders.com.au/assets/wool/weekly/100326%20Greasy.pdf> cited 27th March 2010.
- Lamb and sheep prices Over The Hook http://qcl.farmonline.com.au/files/markets/oth_lamb_Qld.pdf cited 26 March 2010.

- Cattle prices http://qcl.farmonline.com.au/files/markets/Oth_Cattle_QLD.pdf web page cited 26 March 2010. A young age turnoff of weaners is assumed with limited feeding.
- The percentage of meat lambs slaughtered off farm is assumed, with feeding, at 100.0%. Supplementation at high levels of both the lactation and to the lamb of meat genotypes guarantees this. Turnoff weights vary from 16 to 22kg/DW to reflect different weights of goats from fine wools and various meat sheep turned off in Qld.
- Reproduction rates used are those derived by consensus from southern Qld producers at 4 meetings.
- Stocking rate is 1 ewe per 2 ha = 5 acres which is adequate feed for all genotypes. All meat breeds fed up to \$7 /ewe, \$3/lamb/joining. Woolled types and cattle fed at 50% of single joined meat breeds .

Results

- Accelerated systems except for continuous joining based on client results, appear to have an advantage over single matings in the cleanskin scenarios. More work needs to be done in this area to substantiate this finding. If this is true then very high levels of feeding can be incurred to sustain these systems with caution applied to its effects on pasture condition.
- A lift of 10% in weaning for single joined meat enterprises lifts the GM by up to \$4:80/ha. All Gm/ha whether wool or meat are extremely sensitive to weaning %.
- For wool a lift of one micron will give GM increase from \$0.20 To \$3.93 per micron. Differences in micron only becomes sensitive or worth investing in with reductions from 25 to 24 and 20 to 18 micron levels, with wool cut differences factored in.
- Meat :Wool income ratios are a telling indicator with the meat genotypes at 1:0. The Woolled genotypes vary from 1.6:1 for 18 micron merino, up to 13:1 for second cross lambs. Dohne 2.2:1, and SAMM at 3.75:1. This information makes the merino the most ubiquitous sheep meat breed in Australia!
- The Cattle GM is slightly above merino woolled enterprises for the first time in a while since I have done simulations. There are two exceptions. One is the SAMM 23 micron enterprise which compares favourably with meat only enterprises and the SRS fine wool heavy cutting option not simulated. With the advantages of cattle stated above there appear to be good reasons to stay in cattle. However, the rhetoric coming from cattle people in Queensland contradicts this suggesting that this simulation may be a best case scenario.

Discussion

Conception and therefore weaning and slaughter rates are the source of all profitability of meat breeds. This means anything that compromises weaning percentages such as disease, predation, poor joining condition, or nutrition, compromises turnoff and income significantly. Equally anything that lifts concept rates such as accelerated joining has the opposite positive effect. This is possible with cleanskin shedding (non shearing) genotypes that are poly oestrus². This is predicated upon good nutrition and management and avoiding feedlots if possible to maximise profits. Systems that ensure this such as auto lamb and ewe handling, auto data capture, fencing for ram control are good investments. Factored in but not obvious in the simulation is the fact most of my clients are employing more casual labour than woolled enterprises who employ shearers instead to achieve this degree of harvesting precision.

Second in order of importance to the gross margin outcome is the percentage of lambs sent direct to slaughter from the breeding property and their growth rates before breaking teeth. Lambs become hoggets at the emergence of the first incisor tooth. This can happen in Dorper genotypes as early as 14 months. However there is anecdotal evidence from continuous mated flocks that this may occur as early as 8 months, though this cannot be substantiated with unknown birth dates. The benchmark growth rate of >100g/h/d from birth to slaughter weights can be achieved by merino wethers in normal to average years within 12 months with little or no feeding. However considering the high cost of Feedlotting or the provision of annual forage crops or the lesser cost of sown pasture species, annual supplementation of meat genotypes is considered mandatory and prudent to maintain high conception rates in ewes and growth rates in prime lambs, particularly in spring time. Feeds used include cotton seed for ewes and grain for lambs.

Continuous joined flocks suffer poor precision of sheep management and profit wastage. The losses sustained in these flocks selling hoggets cf to lambs can be extreme and they must wean more than 4 times per year in an attempt to avoid hoggets and to achieve semi trailer loads of lambs suited for market or move to controlled mating systems. Predator losses go unnoticed as do ewe losses with some ewes joining and or lambing in hostile weather conditions. These systems are usually adopted by large semi arid properties with low labour and ram availability and poor fencing. They have a much reduced feeding commitment compared to controlled mating systems.

In the wool enterprises, the price income sensitivity between microns has collapsed between 24 and 21 microns. This suggests there is still a reward for pursuing micron declines below 20 microns until over supply again increases and reduces these differences. In my view breeding policies should have an open ended objective of reducing micron at ever increasing wool weights. The irony of the simulation is that there is more value in spending money on meat turnoff of woolled breeds than there is in wool investment. It therefore begs the question "What is the value of wool?" This is further emphasised when Meat : Wool income ratios are compared.

² **polyoestrous** - having more than one period of oestrus per year of **anestrous** - not in a state of oestrus. These terms are used in sheep husbandry to describe differences between sheep that cycle all year round eg Merinos and African breeds compared to say British and European breeds of sheep which may exhibit no oestrus in spring time.

The meat :wool income ratio of woolled breeds or the ratio that shows the main source of income from both meat and wool, are 1.6:1 for “18 micron merino”, 2:1 for “21 micron merino”, “Dohne” at 2.2:1, and “SAMM” at 3.75:1. This suggests the wool “crutch” is shortening quickly as meat prices accelerate with a falling merino flock. It means wool could be severely limiting meat incomes in these enterprises and rather than meat providing a dual purpose income is leading woolled breeds into the archive or novelty category as they enjoy and are exposed increasingly to rising meat prices. That is, while annual management systems are dictated by shearing rather than joining, it can be argued wool is limiting conception rates and profitability in the polyoestrus merino breeds and their derivatives.

The worry for Dual purpose breeds in pastoral Queensland is that they will be unable in a majority of years to turn off 100% wether lambs into the prime lamb market without feeding due to slow growth of the genotypes compared to cleanskin (non merino) genotypes. The best of these so far is the SAMM which has the best growth rates of the merino derivative breeds. However, much feeding (lactation and lamb) above that shown in this simulation will be required to turn off 100% of wether lambs into the prime lamb market in all years. Some Dohne client flocks show only 25% of wether lambs to be eligible as prime lambs in dry years, lifting to near 100% in good green feed seasons. SAMMs do much better but all wool breeds in particular are plagued with tail end or unfinished lambs in normal years without attention to drafting and feeding. Since the sale of prime lambs from the wether portion of the flock is so significant to these enterprises, high levels of management are required to maximise the gross margin.

The other limitation with wool is that woolled breeds, unlike cleanskin sheep or goats, cannot compete with beef in Black Spear grass country which dominates much of Central Queensland and is now invading “wool country”.

So can cleanskin sheep arrest the decline in sheep numbers across Australia? It would seem on the profitability question the answer is a resounding “Yes”. Certainly Queensland flock growth data suggests they are very much on the increase in both small and large flocks and on the increase outside traditional sheep areas such as the coastal fringe. Additionally the number of cattle herds now subject to competition from cleanskin sheep which suggests this phenomenon is going to be around for some time.

To achieve this they need to face a number of challenges including

- Handling the tail end syndrome of lamb finishing on native summer growing perennial pastures
- A contraction of slaughter capacity in all states including Queensland
- The need for late maturing and high growth genotypes of non related breeds to avoid inbreeding

- The logistics of marketing large flocks from semi arid areas by semi loads and avoiding meat quality issues like 'dark cutting'.
- The control of predators and grass seeds and parasites as they are pastured away from traditional sheep areas
- To address the question of stocking rates of cleanskin sheep compared to merino types and to address the validity of Dry Sheep Equivalents as a measure of stocking rates.

These issues can be addressed in another article.



A flock of wether lambs on the banks of the Condamine River ready for market. This is a client composite White Dorper flock of the type simulated in the gross Margin. At least six flocks from 7000, to 15,000 Dorper genotypes exist in western Queensland with one flock of 60,000 Damara genotypes known to exist near Warwick. Asian investors have recently bought 6 Cunnamulla properties hoping to invest in Dorper genotypes for an organic market.