**Australian Shorthorns Performance Recording and Genetic Trends**

The first across herd genetic evaluation of performance traits for Australian shorthorn occurred during 1993 through the BREEDPLAN analysis model. With 18 years of across herd genetic evaluation passing it is a good time to examine the trait recording trends and the impact on genetic progress for the breed.

The following graphs show the trends in trait recording levels as a percentage of animals pedigree recorded with Shorthorn Beef by calving year. The number of pedigree recorded calves per calving years varies between approximately 9,000 and 11,000 animals.

**Calving Traits**

The percentage of calves recorded for birth weight has increased from 32% in the 2000 drop calves to 51% in the 2008 drop calves (Fig 1). This has been mirrored by any increase in the gestation length records from AI calves (11% of 2008 drop) and calving difficulty scores on the 1 to 6 scoring system (1=Unassisted, 2=Easy Pull, 3=Hard Pull, 4=Surgical Assistance, 5= Mal-presentation, 6= Elective Surgical).

![Recording Trends - Birth Weight](image_url)

*Fig 1. Birth Weight Recording Trend*

**Growth Traits**

The percentage of calves recorded for 200 day weight has increased from 41% in the 2000 drop calves to 52% in the 2008 drop calves (Fig 2). Conversely, the percentage of calves recorded for yearling weight over the same period has decreased from 46% to 35% over the same period while being static in the mid to high 30% levels since the 2002 drop. The recording of 600 day weight has stayed relatively static as well at over the same period at around mid to high 20% levels.
Fertility Traits
The percentage of bulls recorded for a scrotal circumference has increased significantly with 17% recorded in the 2000 calving year to 34% recorded in the 2007 calving year (Fig 4). Note that for the traits recorded “later” in an animal's life and the lag time associated, we will observe the 2007 drop calves as the latest “complete” calf drop.

Several large performance recording Shorthorn herds are also submitting current and historic joining details (both natural and AI) to Shorthorn BREEDPLAN for the future generation of Days to Calving EBV.
Carcass Traits
The percentage of animals recorded for ultrasound scan traits (Eye Muscle Area, Rib Fat, Rump Fat and Intramuscular Fat) has also increased significantly with 23% scanned in the 2000 calving year to 35% scanned in the 2007 calving year (Fig 5). Of interest, in the 2007 calving year 58% of animals scanned were males, with the balance of 42% being females. It has long been recognised that scanning females, compared to young bulls, generally provides more variation in the fat traits which is to the benefit of the genetic evaluation for these traits.

![Recording Trends - Scan EMA/FAT/IMF](image)

**Fig 5. Ultrasound Scan Traits Recording Trends**

The current shorthorn genetic evaluation also includes direct measurement of the carcase primarily from the Durham progeny test program. This includes the range of traits collected on the carcase and ranges from approximately 500 retail beef yield records to approximately 2000 marble scores or chemically extracted intramuscular fat records.

**Has the increase in trait recording levels lead to an increase in the rate of genetic progress being achieved by the Shorthorn Breed?**

Between the 2000 to 2008 calving years there has been a general increase in the level of trait recording across birth, calving, growth (particularly early growth at 200 days), fertility and carcase, however has this also resulted in an increase in the rate of genetic progress being achieved by the Australian Shorthorn?

It is common practice for industry to measure the rate of genetic progress being achieved by a breed by way of the change in average Selection Index per calf drop over a defined period. This is a more balanced approach than selecting individual traits as it reflects change in overall profitability as a result of genetic change across a range of traits deemed as economically important for the defined production system and market end point.

For this exercise the Australian Shorthorn Export Maternal Selection Index has been selected. This Index is defined as the genetic differences between animals in net profitability per cow joined for an example...
commercial herd (self replacing herd run in a temperate environment) targeting steers for the Japanese B3 market. Steers are assumed to be pasture grown to feedlot entry then feedlot finished for 150 days. Steers are assumed to be marketed to the feedlot at 450 kg live weight, and then slaughtered after finishing at 675 kg live weight (370kg HSCW)

The trends for the Australian Shorthorn Export Maternal Index shows that the average rate of genetic progress has increased from $1.02 per cow mated per year (2000 to 2004) to $1.38 per cow mated per year (2005 to 2009) or a 35% increase (Fig 6).

![Export Maternal Selection Index Trend](image)

Fig 6. Export Maternal Selection Index Trend

This indicates that the increase in trait recording levels and associated selection benefits (e.g. increased selection accuracy, increased selection differential) has in turn resulted in an increase in the rate of genetic progress being achieved by the Australian Shorthorn breed for the Export Maternal production system. A similar outcome is observed for the Heavy Domestic and SB3 Carcase production systems.

While the increase in the rate of genetic progress for the Shorthorn breed is significant at 35% it is worth noting that several herds within Australian Shorthorn have been able to increase the rate of progress in the range of 200-300% or to $2.20-$4.80 per cow mated per year over the same time period.

With this in mind, Dr Rob Banks, Meat and Livestock Australia’s Manager for Southern Australia R&D was recently quoted in the MLA’s Prograzer Magazine (Autumn 2010 Edition) saying “For genetic improvement to be really transforming commercial returns – which it can – we need to lift the average progress to up and over $7.50 per cow joined per year. That sounds a lot, but is quite feasible as there are now herds making progress at over $5 per cow joined per year - those herds are literally driving genetic profit for their client’s businesses”

Further information on the performance recording trends, Shorthorn Selection Indexes or Shorthorn genetic progress is available from Christian Duff, Technical Officer, Southern Beef Technology Services P: 02 6773 2472 or E: christian@sbts.une.edu.au

*Article compiled by Christian Duff for inclusion in May 2010 Shorthorn Beef Magazine*