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CALVING EASE TRAITS

Calving ease is an important economic trait because of its impact on calf and heifer mortality, labour and veterinary expenses at calving time, and subsequent re-breeding performance of heifers.

EBVs for calving ease are estimated from calving ease scores, birth weight data and gestation length information provided by breeders. Due to the many non-genetic influences on calving ease the trait has a low heritability.

Usually only proven bulls or cows with several progeny recorded have EBVs for calving ease with sufficient accuracy to be reported. Two Calving Ease EBVs are provided – Calving Ease (DIR) and Calving Ease (DTRS).

Calving Ease (DIR) EBVs

Calving Ease (DIR) EBVs are estimates of genetic differences between animals in the ability of their calves from two year old heifers to be born unassisted. The EBVs are reported as differences in the percentage unassisted calvings.

Higher, more +ive, Calving Ease (DIR) EBVs are more favorable. For example, a bull with an EBV of +2.0 % would be expected to produce easier calving progeny from two year old heifers than a bull with an EBV of -2.0 %.

Calving Ease (DTRS) EBVs

Calving Ease (DTRS) EBVs are estimates of genetic differences between animals in the ability of their two year old daughters to calve without assistance. The EBVs are reported as differences in the percentage unassisted calvings.

Higher, more +ive, Calving Ease (DTRS) EBVs are more favorable. For example, a bull with an EBV of +2.0 % would be expected to produce two year old daughters that have less calving problems than the daughters of a bull with an EBV of -2.0 %.

Gestation Length EBVs

Gestation Length EBVs are estimates of genetic differences between animals in the number of days from the date of conception until the calf birth date. These EBVs are estimated from the joining and birth date records for calves got by AI or Hand Mating. The analysis accounts for differences in the “maternal” effect of dams on the gestation length.

Shorter gestation lengths are usually associated with lighter birth weights, easier calving and improved cow re-breeding performance. Calves born with a shorter gestation length are often heavier at weaning due to more days of growth compared to their contemporaries.

Lower, or more -ive, Gestation Length EBVs are generally more favorable. For example, a bull with an EBV of -2.0 days would be expected to produce calves that are born earlier, with easier calving, than a bull with an EBV of +2.0 days.

Birth Wt EBVs

Birth Wt EBVs are estimates of genetic differences between animals in kg of calf birth weight. Calf birth weight is the biggest contributing factor causing calving difficulty in heifers. To minimise the risk of calving difficulty it is recommended that you only use bulls over your heifers that have similar, or lower, Birth Wt EBVs to the heifers.

While low Birth Wt EBVs are favored for calving ease they are also often associated with lower growth potential. Consequently, birth weight and growth need to be carefully balanced.

Fortunately, animals do exist with moderate Birth Wt EBVs and above average EBVs for later growth.

Small, or moderate, Birth Wt EBVs are more favourable. For example, a bull with an EBV of +2.0 kg would be expected to produce lighter calves at birth than a bull with an EBV of +6.0 kg, with a lower risk of a difficult calving if joined to heifers.

GROWTH TRAITS

EBVs are provided for three growth traits: 200-Day Wt, 400-Day Wt and 600-Day Wt, enabling breeders to tailor their selection decisions to achieve desired growth rates for particular market requirements.

In general, with all other things being equal, higher growth rates will lead to higher profitability. However, it is likely that in most situations an optimum point is reached where less emphasis should be placed on further increases in growth. One of the consequences of continued selection for increased growth EBVs is an associated increase in body size at all ages, together with increases in herd feed requirements.

Growth EBVs are estimated from weight data submitted by breeders, adjusted to relevant age classes prior to analysis. In addition, birth weight data also contributes to variation in growth EBVs due to its positive relationship with later weights.

200-Day Wt EBVs

200-Day Wt EBVs are estimates of the genetic differences between animals in live-weight at 200 days of age. This is a measure of an animal's early growth to weaning. It is an important trait for breeders turning off animals as vealers or weaners.

Larger, more +ive, 200-Day Wt EBVs are generally more favorable. For example, a bull with an EBV of +30 kg would be expected to produce heavier calves at 200 days of age (or weaning) compared to a bull with an EBV of +5 kg.

400-Day Wt EBVs

400-Day Wt EBVs are estimates of the genetic differences between animals in live-weight at 400 days of age. This is an important trait for breeders turning off animals as yearlings.

Larger, more +ive, 400-Day Wt EBVs are generally more favorable. For example, a bull with an EBV of +50 kg would be expected to produce heavier calves at 12 to 14 months of age compared to a bull with an EBV of +30 kg.

600-Day Wt EBVs

600-Day Wt EBVs are estimates of the genetic differences between animals in live-weight at 600 days of age. This is an important trait for breeders targeting the production of animals suited for heavy weight grass or grain fed markets.

Larger, more +ive, 600-Day Wt EBVs are generally more favorable. For example, a bull with an EBV of +70 kg would be expected to produce heavier progeny at 18 to 20 months of age than a bull with an EBV of +40 kg.

MATERNAL TRAITS

Differences in calf growth are influenced by a combination of the genetic potential for growth among the calves and the genetic differences in maternal ability of their dams. The differences in maternal ability can largely be attributed to variation in milk production of the dams.

GROUP BREEDPLAN separates the growth and maternal components of 200-Day Wt and 400-Day Wt records to produce EBVs for milk production. A bull's Milk EBVs are based on the growth performance of his daughter's calves.

Mature cow weight is a new maternal trait in Angus GROUP BREEDPLAN. This EBV provides useful information to assist breeders in matching cow size to the environment. It is also a useful indicator of later growth performance for breeders targeting heavy grain or pasture fed bullock production.

Milk EBVs

Milk EBVs are estimates of the genetic differences between animals in milk production potential, expressed through variation in calf growth performance.

A bull with a Milk EBV of +10 would be expected to sire daughters with higher milk production than a bull with Milk EBV of +2 kg. This higher milk production should be reflected through higher weaning weights among the daughter's calves. There is a considerable time lag before a bull obtains a reasonable accuracy for its Milk EBVs due to the time taken before growth performance data is available from his daughter's calves. If a bull is to be used as a terminal sire with no daughters kept as female replacements then his Milk EBVs can generally be disregarded.

The optimum level of milk production potential in beef cows is dependent upon the production system and environment in which the cows are run. Selection for increased milk production might be warranted when cows are run under good nutritional conditions and calves are sold as weaners or vealers. However, not all environments will support high milking cows.

Larger, more +ive, OR moderate, 200-Day Milk EBVs can be more favorable, depending on the environment.

Mature Cow Wt EBVs

Mature Cow Weight EBVs are estimates of the genetic differences between animals in cow weight at 5 years of age.

Mature cow weight EBVs for sires are based weights recorded on their daughters (following the weaning of their calves), plus consideration of overseas genetic information and the genetic relationships known to exist between cow weight and earlier growth performance.

While moderation in cow weight is desirable for reducing herd feed costs, it is also often associated with lower overall growth potential. Consequently, mature cow weight and early growth performance need to be carefully balanced to optimise overall herd productivity.

Sires with above average EBVs for 400-Day Wt. or 600-Day Wt. will also tend to have above average mature cow weight EBVs. However, following the analysis of weight records on their daughters, some sires have been identified that tend to have smaller (or larger) mature weights relative to that predicted from their early growth performance.

Smaller, or moderate Mature Cow Weight EBVs are generally more favorable. For example, a bull with an EBV of +50kg would be expected to produce daughters with lighter mature weights and lower feed requirements than a bull with an EBV of +80kg.

FERTILITY TRAITS

Fertility is a critical component influencing the profitability of a breeding herd. EBVs are provided for two fertility traits - Days to Calving and Scrotal Size. These traits contribute important information to assist in making breeding decisions to maintain herd fertility. Days to Calving EBVs are estimated from the joining and calving date records provided by breeders. Scrotal Size EBVs are based on measurements recorded on yearling bulls and known genetic relationships with recorded growth traits.

Days to Calving EBVs

Days to Calving EBVs are estimates of genetic differences between animals in female fertility, expressed as the number of days from the start of the joining period until subsequent calving.

Variation in Days to Calving records is mainly due to differences in the time taken for females to conceive after the commencement of the joining period. Females with shorter Days to Calving EBVs tend to commence cycling earlier after calving and conceive earlier in the joining period. They also tend to attain puberty at a younger age as heifers.

Days to Calving EBVs for bulls are based on the performance of their daughters and female relatives. Differences in scrotal size among bulls can also contribute to variation in Days to Calving EBVs.

Lower, or more -ive, Days to Calving EBVs are more favorable. For example, a bull with an EBV of -3.0 days would be expected to produce daughters that conceive earlier in the joining period, and subsequently calve earlier, than the daughters of a bull with an EBV of +3.0 days.

Scrotal Size EBVs

Scrotal size EBVs are estimates of the genetic differences between animals in scrotal circumference at 400 days of age.

Increased scrotal size is associated with increased semen production in bulls, and earlier age at puberty of bull and heifer progeny. Scrotal size also has a favorable relationship with Days to Calving, such that bulls with larger scrotal size EBVs tend to have daughters with shorter Days to Calving intervals.

Larger, more +ive, Scrotal Size EBVs are more favorable. For example, a bull with an EBV of +4.0 cm would be expected to produce sons with larger scrotal size at yearling age and daughters that reach puberty earlier, than the progeny of a bull with an EBV of -4.0 cm.

CARCASE TRAITS

Angus GROUP BREEDPLAN uses data obtained from ultrasonic real-time scanning of live animals and abattoir chiller assessment data to estimate EBVs for carcass weight, eye muscle area, rib and rump fat cover, percentage retail beef yield, and intra-muscular fat percentage (marbling).

To date, the majority of the data used in the calculation of carcass EBVs has come from ultrasound scan measurements taken by accredited scanning technicians. GROUP BREEDPLAN can now use relevant abattoir carcass data collected on animals in structured progeny test programs, together with suitable overseas genetic information.

EBVs for carcass traits can be used, together with visual assessment for muscularity and maturity type, to assist in breeding cattle for specific market requirements.

Carcase Weight EBVs

Carcase weight EBVs are estimates of the genetic differences between animals in untrimmed hot carcass weight at 650 days of age.

Differences in carcass weight EBVs are estimated from available abattoir carcass weight records and known genetic associations with growth traits. Animals with high 400 and 600-day weight EBVs will also tend to have high carcass weight EBVs.

Larger, more +ive, Carcass Weight EBVs are more favorable. For example, a bull with an EBV of +40kg would be expected to produce progeny with heavier carcasses at 650 days of age than a bull with an EBV of +10 kg.

Eye Muscle Area (EMA) EBVs

EMA EBVs are estimates of the genetic differences between animals in eye muscle area (cm²) at the 12/13th rib site on a 300kg carcass. EMA has a positive relationship with retail beef yield.

Larger, more +ive, EMA EBVs are generally more favorable. For example, a bull with an EBV of +2.0 cm² would be expected to produce progeny with a greater degree of muscle expression and higher retail beef yield at any particular carcass weight, than a bull with an EBV of -2.0 cm².

Rib Fat EBVs

Rib Fat EBVs are estimates of the genetic differences between animals in fat depth (mm) at the 12/13th rib site, on a 300kg carcass.

The use of Rib Fat EBVs depends on your goals relating to the finishing ability of your animals. Breeders aiming to breed leaner cattle may select for lower fat values, whilst a breeder aiming to use a bull over dairy cross cows to produce vealers may need to choose a bull with higher fat EBVs to ensure meeting market demands. Fat depth has a negative relationship with retail beef yield.

Recent analyses of the Angus database indicate a general tendency for animals with positive fat EBVs to have shorter days to calving intervals. Consequently, breeders should be cautious about applying intense selection for lower Fat EBVs in situations where female replacements are kept.

More positive (+ive), OR more negative (-ive), Rib Fat EBVs may be more favorable, depending on your breeding goals. For example, a bull with an EBV of -1.0 mm would be expected to produce leaner carcasses at any particular carcass weight than a bull with an EBV of +1.0 mm.

Rump Fat EBVs

Rump Fat EBVs are estimates of genetic differences between animals in fat depth at the P8 rump site on a 300kg carcass.

There is a strong positive genetic relationship between rump fat and rib fat. Animals with extreme (high or low) Rib Fat EBVs also tend to have extreme Rump Fat EBVs. Differences between Rib and Rump Fat EBVs for individual animals may indicate differences in carcass fat distribution.

More positive (+ive), OR more negative (-ive), Rump Fat EBVs may be more favorable, depending on your breeding goals. For example, a bull with an EBV of -1.0 mm would be expected to produce leaner carcasses at any particular carcass weight than a bull with an EBV of +1.0 mm.

Retail Beef Yield % (RBY%) EBVs

RBY% EBVs are estimates of genetic differences between animals in percentage retail beef yield in a 300kg carcass.

RBY% reflects economic differences in carcass value and refers to the bone-out yield of a carcass, with 2-3 mm fat trim, adjusted to 85% chemical lean. Currently, variation in RBY% EBVs is determined largely from differences in ultrasound fat and EMA measurements between animals and a small negative relationship with growth and carcass weight EBVs.

Larger, more +ive, RBY % Index values are more favourable. For example, a bull with an EBV of +1.0 % would be expected to produce calves with higher yielding carcasses at any particular carcass weight than the calves sired by a bull with an EBV of -1.0 %.

Intra-muscular Fat % (IMF%) EBVs

IMF% EBVs are estimates of genetic differences between animals in percentage intra-muscular fat (marbling) in a 300kg carcass.

For markets where marbling is important (e.g. Japanese B2/B3 market, high quality domestic hotel/restaurant and specialist butcher trade) differences in IMF% can contribute significantly to carcass value.

Differences in IMF% EBVs are estimated from information obtained from overseas genetic evaluations of marbling (i.e. American Angus Association Marbling EPDs), together with IMF% data obtained from animals sampled in the Beef CRC progeny test program, and genetic relationships found to exist with ultrasound scan fat depth measurements.

Depending on your market targets, positive IMF% EBVs may be more favorable. For example, a bull with an EBV of +1.0 would be expected to produce calves with higher average marble score at any particular carcass weight than a bull with an EBV of -1.0.