Paddock Guide

TO

STRUCTURAL SCORING

FOR

Genetic Evaluation

ANGUS

AUSTRALIA

Acknowledgement

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Meat & Livestock Australia Donor Company

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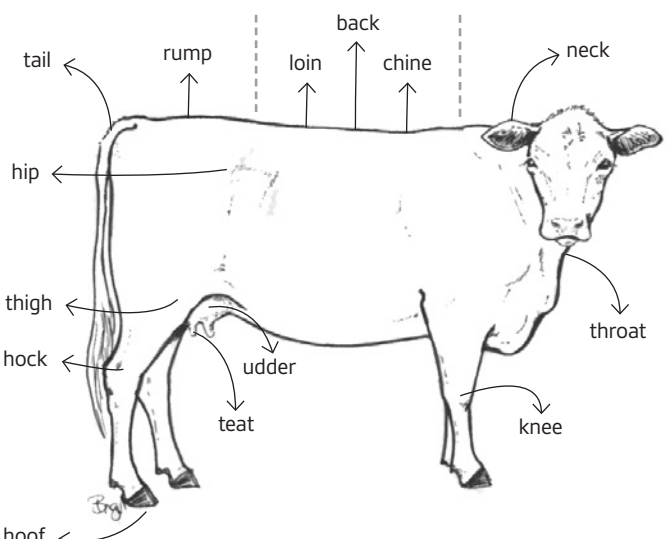
Background

The following guide provides an overview of structural scoring Angus animals for the purpose of including the information in the genetic evaluation conducted by Angus Australia.

The scoring system adopted by Angus Australia is based on the Beef Class and Beef Improvement Federation systems, which assess the structural correctness of key features of an animal.

The scoring systems works on a 1-9 scale, with only whole scores accepted when scoring animals for the traits examined as part of this guide.

Structural scoring can be performed on all classes of stock, from yearlings heifers and bulls, to mature cows.



Introduction to Structural Scoring

Structural scoring assesses the physical characteristics over three key areas for genetic evaluation to assess the structural conformation of the animal, these include;

- Feet – Claw set and foot angle
- Legs – Side and hind view
- Udder – Evenness, suspension, teat shape and size

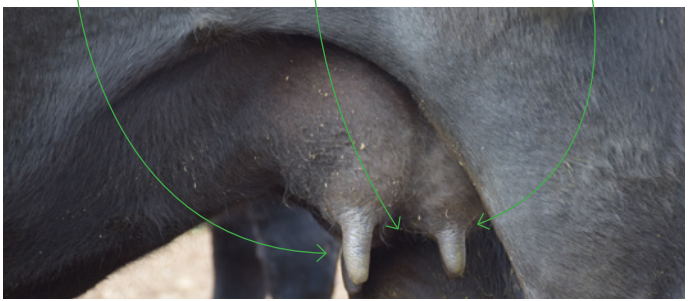
To effectively structural score animals you will need to be able to clearly view the animal from the front, side and rear, as shown by the photographs in this guide, for each scored trait. The animals will need to be in an environment that enables clear line of sight to the trait, such as the yards which typically involves compacted level ground.

This guide provides both artistic illustrations and photographs, supported by detailed descriptions of the characteristic features of each area to assess.

Teat Size and Shape
Assessing the length and symmetry of the teats

Udder Evenness
Assessing the angle of the udder floor

Udder Suspension
Assessing the level with which the udder is held up against the body



Rear Leg Hind View
Assessing the rear leg from behind

Rear Leg Side View
Assessing the rear leg from the side

Foot Angle
Assessing the depth of heel

Claw Set
Assessing the shape of the claws

STRUCTURAL SCORING

Areas to assess

Assessing the claw set

When assessing the claw set in either front or rear feet, scorers are assessing the shape of the inside edge of each of the claws, on both feet, and the space between the claws.

The following pictures highlight the inside edge of the claws. The blue lines show an example of some of the variation seen in claw set, with the straight inside edge of the animal on the left compared to the curved edge of the claws on the right animal. Both images show the front claws of the animals.

Assessing the foot angle

When assessing the foot angle in either front or rear feet, scorers are assessing the depth of heel present, relative to the angle of the front of the claws.

The following pictures show some of the variation in foot angle. The blue lines highlight the greater depth of heel present in the animal on the left compared to the animal on the right. This greater depth has resulted in a sharper angle in the foot of the animal on the right compared to the picture of the animal on the left. Both images show the front foot angle of the animals.

Assessing the rear leg hind view

When assessing the rear leg hind view scorers are assessing the angle between the metatarsus and the tibia, visible from behind. The direction of the rear feet can be a good indicator.

The following pictures highlight the bones which are above and below the hock of the animal. The blue lines show an example of the angle seen, with the reduced angle of the left animal compared to the straight angle of the right animal. As a result of this angle, the animal's feet on the left angle away from the body a feature referred to as *'cow hocked'*.

Assessing the rear leg side view

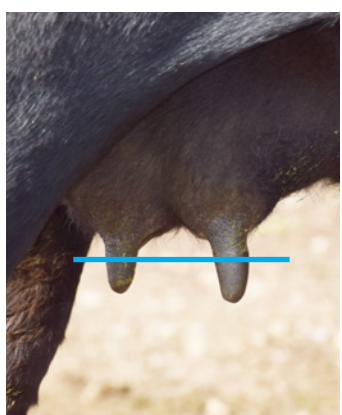
When assessing rear leg side view, scorers are assessing the angle of the metatarsus bone relative to a vertical line between the pin bone and the ground.

The following pictures shows some of the variation seen in rear leg side view. The blue line shows the angle of the metatarsus relative to the vertical line is parallel in the animal on the left compared to the significant angle in the animal on the right.

Assessing the udder evenness

When assessing udder evenness, scorers are assessing the angle of the udder floor, assessed from the side of the female. The trait is assessed within 24-48 hours of calving, when the female is expected to have a full udder.

The following pictures highlight the variation seen in udder evenness. The blue line shows the angle of the udder floor, with a distal slope on the left female compared to the level udder floor of the female on the right.



Assessing the teat size and shape

When assessing teat size and shape, scorers are assessing the length and symmetry of the teats on the udder as two traits shape and size.

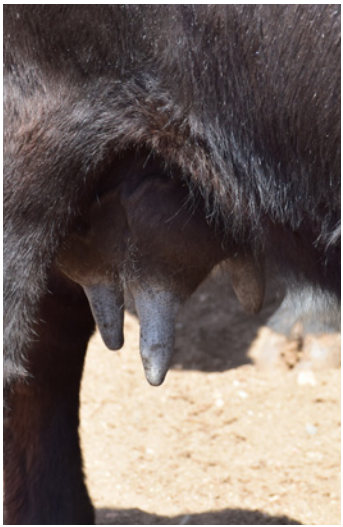
Teat size and shape is highly variable, even within the teats on the udder. It is important to score the worst teat on the udder when scoring, if variation exists.

Teat shape is assessed based on the symmetry of the teat, which should cause the teat to appear as a cylinder with the same thickness throughout.

The size of the teat should be assessed as the length of the teat.

Importantly though if the teat has been compromised and is no longer functioning or visibly affected by mastitis, the female should not be scored.

The following pictures highlight some of the variation seen in the teat size and shape.

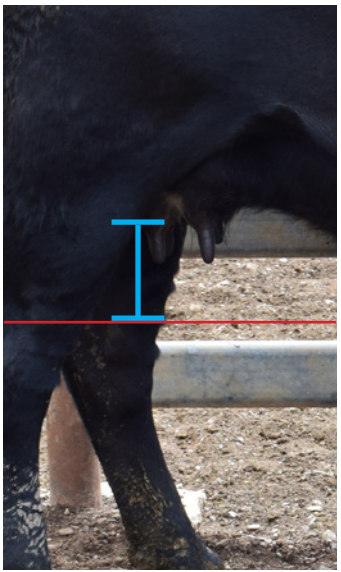


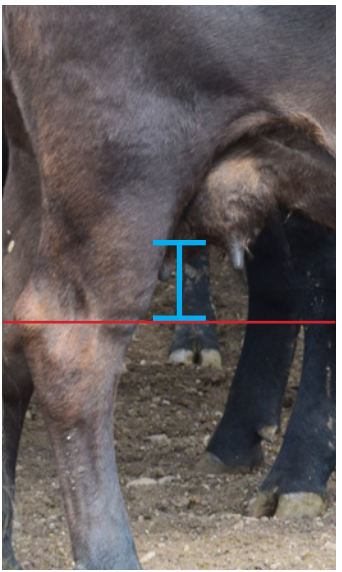

Assessing the udder suspension

When assessing udder suspension, scorers are assessing the medial ligament of the udder and the level with which it holds the udder up against the abdomen. The hock can be used to context the depth of the udder on the female.

The following pictures demonstrate variation in udder suspension. The female on the left displays a medial ligament holding the udder tight against the body. Compared to the female on the right, who displays a looser udder with the medial ligament not as pronounced causing the teats of the udder to begin to splay outward.

When assessing udder suspension take the lowest point of the udder as the reference point.





Abnormalities in Structure

The following section details some of the abnormalities which may be encountered when structurally scoring animals.

Individuals expressing the following features should be recorded using the associated trait code and scoring system listed below;

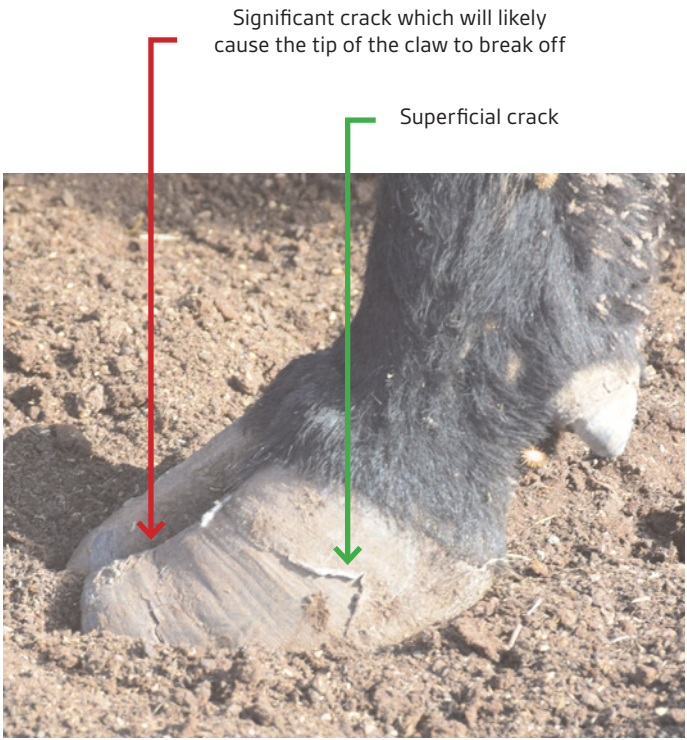
- Hoof cracks
  Animals exhibiting cracks should be recorded with a value of 'Yes', under the trait code CRK.
- Interdigital fibroma
  Animals exhibiting cracks should be recorded with a value of 'Yes', with the trait code CRN.

INTERDIGITAL FIBROMA

Interdigital fibroma, also referred to as interdigital hyperplasia or corns, are growths between the claws. Animals typically go lame quickly as walking causes the fibroma to become pinched between the claws.

CRACKS, DAMAGE AND INJURY

The presences of cracks, damage or injury to the hoof or legs are common and whilst animals with superficial cracks or damage can still be scored, those animals with cracks, damage or injuries which are likely to affect their score should not be scored. An example of this is when the crack has caused a piece of the claw to break off.



Things to consider when structural scoring

When structural scoring animals, it is important to be objective in the assessment and not make adjustments to allow for non-genetic factors that may influence the structure of the animal.

STOCK CLASS

Structural soundness can be influenced by the stock class of an animal. Typically, as general rules we see;

- The feet and udder of animals deteriorates as they age. The udder will also be impacted by the number of calves the cow rears.
- Older animals will have more pronounced bone structures then younger animals.

It is important that the same criteria are used when scoring different stock classes. For example, don't be more lenient when scoring older animals, by comparison to younger animals.

IMPACT OF ENVIRONMENT

Like all traits, environment has an impact on the phenotype we see expressed.

When assessing structural characteristics, it is important that animals are scored based on the phenotype that they express and allowances are not made for the environment in which they are raised. Some environmental conditions can increase the presence of poor structure. Most notably, sandy soil in arid areas typically leads to a great prevalence of cracks and length of claws in cattle.

This should not affect the scores given to animals raised in this type of environment.

HOW THE ANIMAL STANDS

When scoring animals, particularly for rear leg side view and rear leg hind view, scorers should take the time to ensure the animal is standing correctly.

When put under pressure from observers, animals can stand in unnatural positions or with weight unevenly distributed. This can mean features particularly associated with the rear leg structure can be inaccurately scored.

Animals should be assessed for lameness prior to scoring, as lame animals may stand in unnatural positions in response to the cause. Animals which are lame at the time of scoring feet and leg traits should not be scored.

TRIMMING

Foot trimming can significantly affect the score given to an animal. For this reason, it is critical that animals are scored before any trimming is undertaken.

If the animal has previously been trimmed it is important that management groups appropriately reflect past trimming events. This is not limited to the year of scoring and individuals which have had hoof trimming performed in previous years should be assigned an appropriate management group.

CALF AT FOOT

When assessing udder traits it is important to consider the impact the calf has on the expression of the udder traits. Calves that have recently fed, may cause the udder of the cow to appear uneven or effect the expression of teat size and shape.

Things to consider for genetic evaluation of structural traits

WHEN TO SCORE

Structural scores can only be analysed in TACE for animals that have a prior 200 or 400 day weight included in the analysis. The most recent 200 or 400 day weight contemporary group forms an important criteria in determining the contemporary group in which structural soundness scores are analysed.

Feet and leg scores can be taken at any time throughout the year. Only one score per animal per year is required. TACE can analyse structural soundness scores from animals older than 320 days of age (i.e greater than 10 months of age). Scores on both young animals, and mature females can be analysed.

Udder scores should be taken within 24 - 48 hours of calving, in association with calving ease and birth weight data. These scores, along with rear leg hind view sheath and navel scores, udder evenness and attachment, teat size and shape and capacity, are not currently included in the TACE analysis however they may be used to develop Structural Soundness EBVs for these traits in the future.

REPEAT SCORES

The same animal can be scored multiple times across its life. In general, scoring yearlings once, and mature females once per year, is sufficient.

USE THE SAME SCORER

Variation will exist between scorers, with some scoring slightly higher or lower depending on individual decision making. For this reason, it is important that the same person scores all animals within a management group.

SCORE ALL ANIMALS ON THE SAME DAY

It is important that all animals within a management group are scored on the same day.

VARIATION IN SCORES IS KEY

While animals should be scored as per the scoring system, it is important that there is variation in the structural scores that are submitted. Genetic evaluation works by identifying differences between animals. If little or no variation is identified between animals, particularly within management group and age class, then the effectiveness of the structural scores for genetic evaluation will be limited.

CONSIDER MANAGEMENT GROUPS

The structural scores of an animal can be influenced by environmental and management conditions. For this reason, genetic evaluation analyses cattle in contemporary groups to take out the influence of as many of the non-genetic effects as possible (e.g. management, nutrition, feed, year, season, injury, health status, pregnancy status).

It is essential that managements groups are submitted in association with structural score information to identify animals that have been subject to different non-genetic effects. The underlying principle is that only animals that have had an equal opportunity to perform should be included in the same management group.

SCORE BOTH FRONT AND REAR FEET

When scoring claw set and foot angle, the front and rear feet should be scored separately. If there is variation from left to right in the animal's claw set or foot angle, the score that is recorded should reflect the worst foot.

USE OF ACCREDITED TECHNICIANS

In circumstances where you are unsure of your ability to score animals yourself, or would prefer an independent assessment of your animals, an accredited technician can be used to structurally score your animals. A list of accredited technicians is available from the Angus Australia website.

STRUCTURAL SCORING

Quick Guide

Variation seen in the Angus breed

The following quick guide will focus on the range of scores typically expressed within modern Angus animals. The full range of features for the traits are described in the 1-9 score range, with the pictures highlighting the variation typically seen within modern Angus animals.

Front & Rear Feet Claw Set

1 2 3 4 5 6 7 8 9

Open Divergent (OD) *Scissor claws (SC)*

Reference: Shape (primarily curl) and evenness of the claw set.

Sourced from American Angus Association

Front & Rear Feet Angle

1 2 3 4 5 6 7 8 9

Steep feet angle (SA) *Shallow feet angle (SA)*

Reference: Strength of pastern, depth of heel and length of foot.

Sourced from American Angus Association

Rear Leg Side View

1 2 3 4 5 6 7 8 9

Straight rear leg (ST) *Sickle hocked rear leg (SI)*

Reference: Angle measured at the front of the hock.

Rear Leg Hind View

Bow legged rear leg (BL) Cow hocked rear leg (CH)

Reference: Direction of the feet when viewed from the rear.

Udder Evenness

Dropped hind quarter Dropped fore quarter

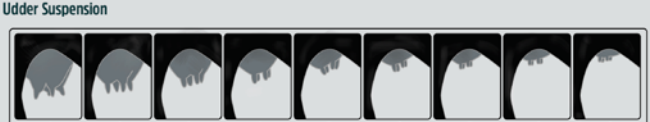
Reference: Even distribution of the fore and hindquarter of an udder viewed from both sides

Teat Size & Shape

Very small button teats Very large / bulbous / carrot

Reference: Size and shape of four main teats.

Udder Suspension



Very loose Very tight

Reference - Depth of the udder relative to the hock

Sourced from American Angus Association

1 2 3 4 5 6 7 8 9

Assessing the level of separation between the claws and the degree of curl on the inside edge of the claws

5 6 7 8

Front (FC) and Rear Claw (RC) Set

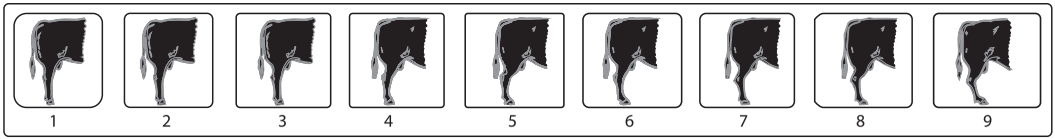
Sourced from American Angus Association

1 2 3 4 5 6 7 8 9

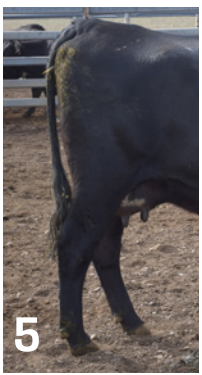
Assessing the depth of heel and level of slope on the hoof

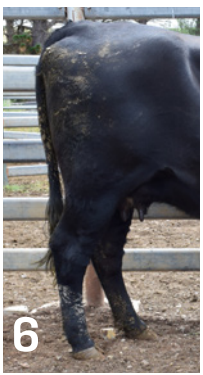
5 6 7 8

Front (FA) and Rear Foot (RA) Angle

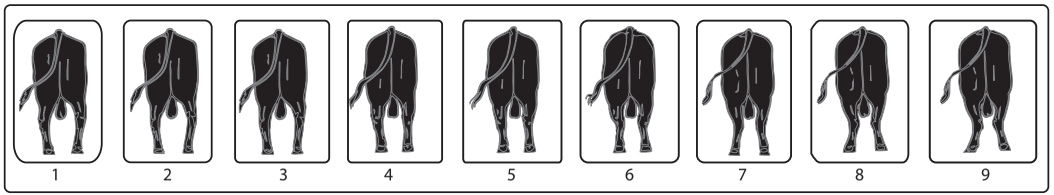


Assessing the angle of the metatarsus bone relative to a vertical line between the pin bone and the ground.

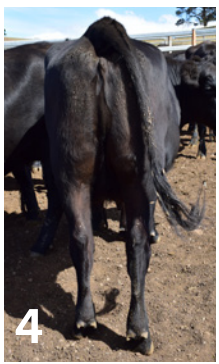


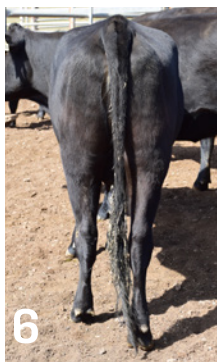


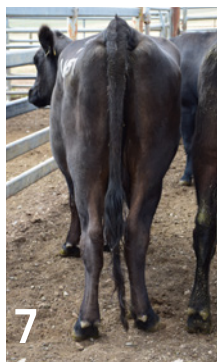
Rear Leg Side View (RS)



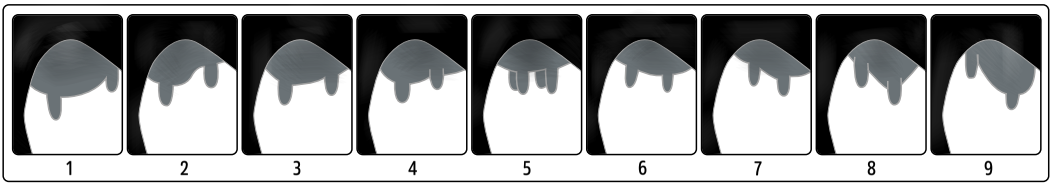
Assessing the angle between the metatarsus and the tibia visible from behind.







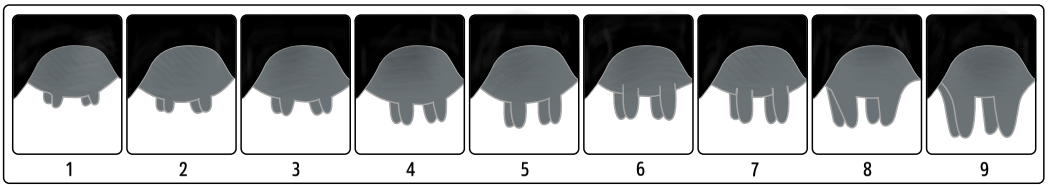
Rear Leg Hind View (RH)



Assessing the angle of the udder floor, assessed from the side of the cow.

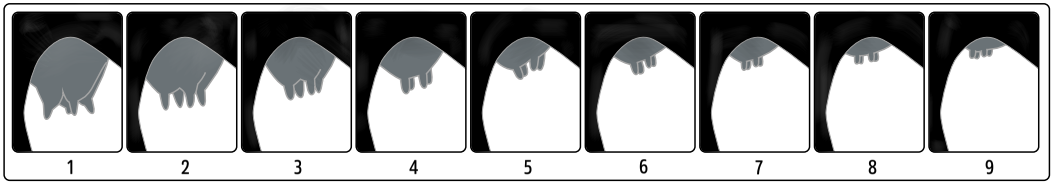
2 3 4 5

Udder Evenness (UE)



Assessing the length and symmetry of the teats on the udder as two traits shape and size.

Teat Size and Shape (TZ)



Assessing the medial ligament of the udder and the level with which it holds the udder up against the abdomen.

3 4 5 6

Udder Suspension (UU)

Structural Scoring

Test Yourself

When structural scoring animals, it is important to be consistent and objective in your assessment. It can be valuable to practice on groups of animals prior to scoring to ensure consistency in scoring.

Individual scorers will have subtle differences with the score they give to an animal, therefore it is important the same scorer scores all animals scored on a particular day.

The key message with assessing the structural conformation of animals is the ability to identify differences within animals rather than everyone scoring the same animal, the same.

The following questions provide an introduction to the type of decision making required when structural scoring Angus animals.

1) Which cow has the better claw set?

Based on the front view of the two animals below, identify the animal with the more desirable claw set.

To challenge yourself identify the difference between the scores (e.g. FC 5 and FC 7 = a difference of 2 claw set scores)?

Answer: .....

2) What rear leg side view scores would you give the following bulls?

Based on the side view of the animal below, identify the animal's structural score for rear leg side view.

Answer: .....

3) Which of the cows has a front foot angle of 5?

Based on the side view of the animals below, identify the animal which would score a 5 for front foot angle.

To challenge yourself score the remaining cows in the group.

Answer: .....

4) Does the cow have desirable udder suspension?

Based on the side view of the animal below, identify whether the animal has desirable udder suspension

To challenge yourself score the udder of the cow for the udder traits?

Answer: .....

5) Score the following cow for all traits which can be assessed from a side view?

From the side view of the below, what traits can you score and what score would you give the cow for the trait?

Answer:

Test yourself Answers

1) Cow A. Cow A (FC6) is 1 score above Cow B (FC7).

2) Bull A has a RS of 5 and Bull B has a RS of 7

3) Cow B has a FA of 5, with greater heel depth than the other cows which would score 7 or greater

4) Yes, whilst the udder suspension is not 5, the cow does have an udder that is held up against the body UU4, well above the hocks. The cow has moderate udder evenness (UE7) and teat size and shape (TZ7)

5) FA5, RA6, RS4, UE3, TZ4, UU6

Structural Scoring

Submitting to Angus Australia

Structural scores can be submitted to Angus Australia using a Microsoft Excel template that is available through the Angus Australia website www.angusaustralia.com.au

Structural scores can also be submitted via an extract from a compatible herd recording software package (e.g. KoolCollect, StockBook, HerdMASTER).

When submitting structural scores, it is important to;

- Accurately record the Animal ID
- Accurately record the date of scoring
- Assign appropriate management groups
- Accurately record the accredited scorer. If you score your own animals, record an accreditation number of 9999.
- Record the correct trait code –

Claw set - Front feet	FC
Claw set - Hind feet	RC
Feet Angle - Front	FA
Feet Angle - Rear	RA
Rear legs - Hind view	RH
Rear legs - Side view	RS
Udder Evenness	UE
Udder Suspension	UU
Teat size and shape	TZ
Hoof cracks	CRK
Interdigital fibroma (Corns)	CRN

Example Data Submission

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	L	H	ASSESS	SOCIETY	HERD	DATE-OBS	ANIMAL-ID	GRP	FC	RC	FA	RA	RS	RH	CRK	CRN	UE	UU	TZ
2	L	X	Assessor	Society	Herd	Assessment	Animal Ident	Man	Claw Set		Feet Angle		Rear Leg		Hoof	Interdigital	Udder	Udder	Teat
3	L	X	Number	Code	Ident	Date		Grp	Front	Rear	Front	Rear	Side	Hind	Cracks	fibroma (Corns)	Evenness	Suspension	Size
4	L	X																	
5	L	D	5003	ANGS	ABC	20191026	ABCP1	INJ	7	7	6	7	5	6			7	4	7
6	L	D	5003	ANGS	ABC	20191026	ABCP2		5	6	5	7	4	5			6	4	6
7	L	D	5003	ANGS	ABC	20191026	ABCP3		7	7	7	7	6	6			8	5	2
8	L	D	5003	ANGS	ABC	20191026	ABCP4			5	5	5	5	5	Yes				
9	L	D	5003	ANGS	ABC	20191026	ABCP6		6	5	5	5	8	7					
10	L	D	5003	ANGS	ABC	20191026	ABCP8		7	7	6	6	5	5					
11	L	D	5003	ANGS	ABC	20191026	ABCP19		5	5	7	5	5	5					
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FOR FURTHER INFORMATION

Further information on assessing structural soundness and collection of performance recording information for a range of traits can be found by going to the Angus Education Centre, www.angusaustralia.com.au

For further information on contact staff at Angus Australia on (02) 6773 4600 or office@angusaustralia.com.au

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