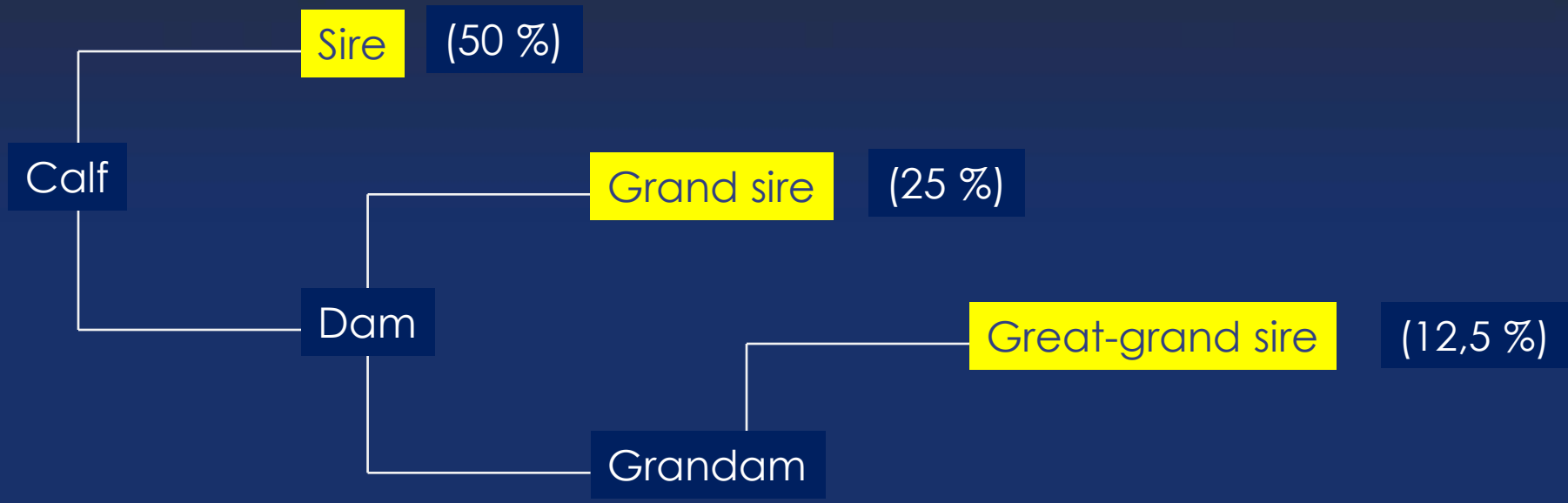
Choosing the right sire … not an easy task !

What to look for ? How to reduce mistakes ?

Pierre Desranleau
Beef division – Ciaq
24 November 2018

Concevons l'avenir

A considerable impact …
87,5 % of the genes in your 2018 calf crop come from the last 3 bulls you used !



Lasting effects …

- Bull bought in 2018 will have an influence in your herd for at least 10 years
- His daughters will have their first calf between 2021 and 2023
- His grand daughters will have their 4th calf between 2026 and 2028 …

4 aspects to consider :

- 1. the numbers (weights, EPD's)
- 2. the pedigree
- 3. the conformation
- 4. the breed … there can be $$$ that are lost here

  (obviously, only applies to commercial herds)

1. The numbers … which ones should you prioritize ?

the bull's actual weights ??? … 80 lb , 900 lb , 1 500 lb …

- not very useful …
- highly influenced by environment
- a feeding program is not heritable !

Impact of management on performances … they have the same genetics for WW !

Spyder … 952 lb actual wean. wt.
(was fed for the show …)

Palermo … 625 lb actual wean. wt.
(grazed marginal pastures …)

EPD's : 9 X more accurate than actual weights

How come ?

- eliminate biases due to environment (comtemporary grouping)
- take into account the bull's own performance
- take into account strength (weakness) of his pedigree
- take into account heritability of the trait (ex. ww = 30%)

Being able to interpret EPD's is a must !

Caractère Trait	FV CE	PN BW	PS WW	P1 YW	Lait Milk	FVM MCE	Pds filles Cow Wt.	Hauteur Height	Gest. taures Heifer preg.	$ EN	Oeil longe Rib Eye
Moy. race/Breed Average	6,0	1,3	49	86	23	8,0	26	0,3	10,0	-2,47	0,42

200 AN 10722 Koupal **KOZI** 418

KOUPAL KOZI 22 x KOUPAL BRULEE 698

ÉLEVEUR : KOUPAL ANGUS FARM, SOUTH DAKOTA, É.-U.

- 5e plus haut prix parmi 178 taureaux à la vente Koupal 2015 (17 500 $). Ses veaux affichent une conformation à son image : structure solide, longueur et profondeur.
- Gamme d'ÉPD sensationnelle : meilleurs 5 % croissance, meilleurs 15 % oeil de longe, meilleurs 30 % FV, PN... et un modérateur de format adulte hors pair.
- Kozi est également issu de l'une des souches maternelles les plus réputées aux États-Unis.
- 5th high seller among 178 bulls at the 2015 Koupal Sale ($17,500). Now proven, you can count on him to sire length and depth on a solid structure.
- Sensationnal set of EPD's: top 5% growth, top 15% REA, top 30% CE, BW... and an outstanding mature size moderator.
- Kozi stems from one of the top cow families in the US.

Tatouage/Tattoo	N° enr.	Né le/Born	PN/BW	PS/WW	P1/YW	FS	CS/SC
IMP 418B	1835081	07/01/14	83 lb	769 lb	1366 lb	6,0	38 cm

ÉPD (lb) - Association américaine Angus - Septembre 2017

Caractère Trait	FV CE	PN BW	PS WW	P1 YW	Lait Milk	FVM MCE	Pds filles Cow Wt.	Hauteur Height	Gest. taures Heifer preg.	$ EN	Oeil longe Rib Eye
ÉPD	9,0	0,6	76	122	25	6,0	-5	-0,2	9,2	-10,07	0,67
Précision/Accuracy	0,36	0,61	0,55	0,39	0,24	0,19	0,22	0,27	0,11	--	0,31

Recommandations/Recommendations:

FACILITÉ DE VÊLAGE / CALVING EASE ✪✪✪ | CROISSANCE / GROWTH ✪✪✪✪ | MUSCULATURE / MUSCLING ✪✪✪ | FEMELLE DE REMPLACEMENT / REPLACEMENT FEMALES ✪✪✪✪

Mère

Falardeau Angus Ranch, Saint-Alban

Ferme C M Migneault, Rouyn-Noranda

Ferme Bo-Pré SENC, Chesterville

New EPD's are added on a regular basis

- Udder traits (in Herefords)
- Cow weights (in some breeds)
- Longevity (in some breeds)
- Feet and legs (to come soon in US Black and Red Angus)
- Feed efficiency (Hereford, US Black and Red Angus)
- Disease resistance (to come soon)
- Others …

… in short, they are an invaluable source of information

not using them makes your selection less accurate

The fact that your cows weigh 1700 lb …

… or 1300 lb …

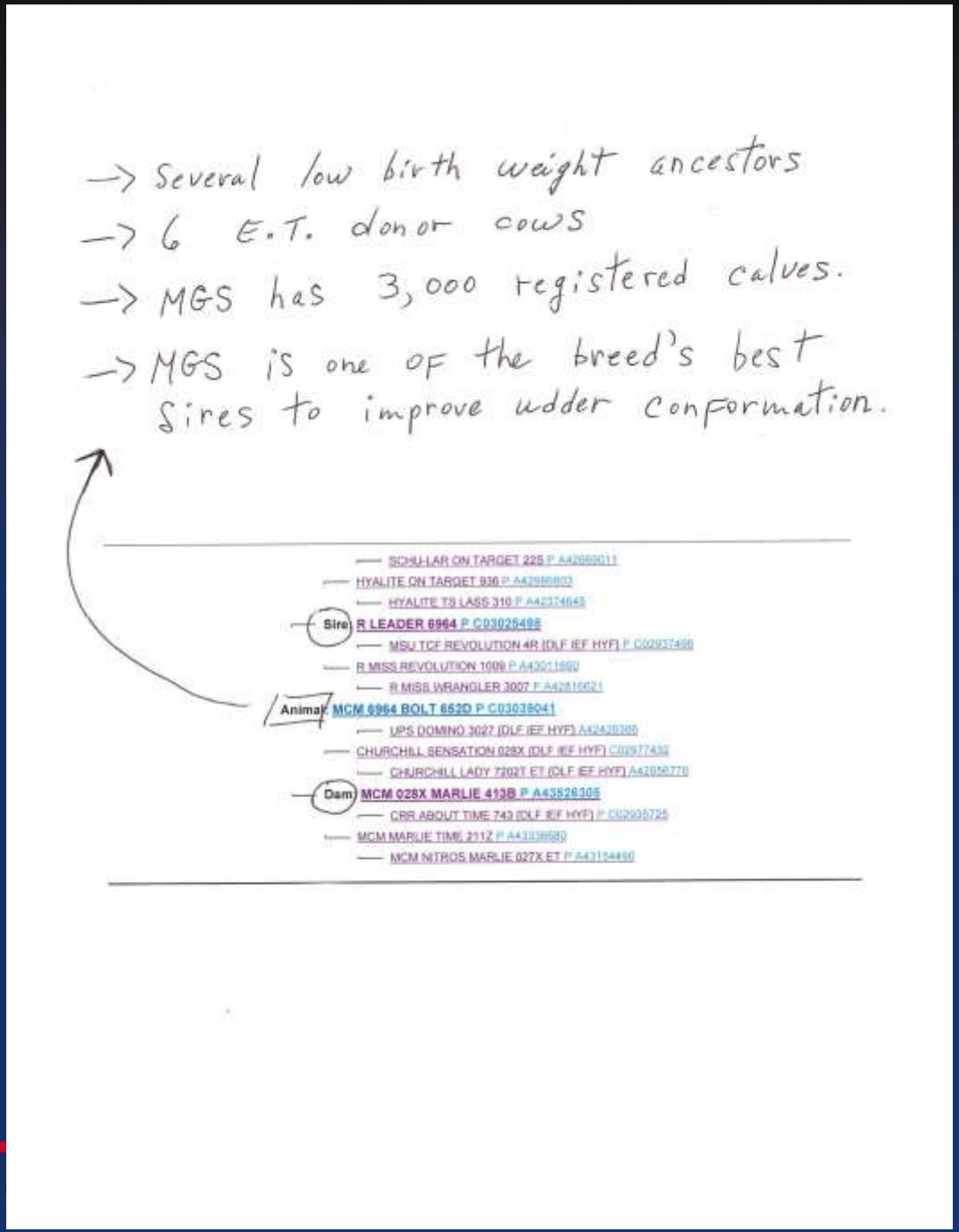
or have dropping udders due to excessive milk potential …

… all this can be predicted/managed by your knowledge of EPD's

2. A pedigree … it's full of infos !

<u>How to make it speak ?</u>

- purebred breeders
- the breed's website
- google



3. Conformation and the auxiliary traits … because EPD's don't tell the whole story !

Stature (frame score)
- highly heritable -

moderate … frame score 5
55 inches at the hips @ 33 m

taller … frame score 7+
59 inches at the hips @ 33 m

“Frame Score” basé sur la hauteur aux hanches (en pouces) pour les taureaux de 5 à 21 mois.

	“Frame Score”								
Âge en mois	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
5	33.5	35.5	37.5	39.5	41.6	43.6	45.6	47.7	49.7
6	34.8	36.8	38.8	40.8	42.9	44.9	46.9	48.9	51.0
7	36.0	38.0	40.0	42.1	44.1	46.1	48.1	50.1	52.2
8	37.2	39.2	41.2	43.2	48.2	48.2	49.3	51.3	53.3
9	38.2	40.2	42.3	44.3	46.3	48.3	50.3	52.3	54.3
10	39.2	41.2	43.3	45.3	47.3	49.3	53.3	53.3	55.3
11	40.2	42.2	44.2	46.2	48.2	60.2	52.2	54.0	56.2
12	41.0	43.0	45.0	47.0	49.1	51.0	53.0	56.0	57.0
13	41.8	43.6	45.8	47.8	49.8	51.8	53.8	55.8	57.7
14	42.5	44.5	46.5	48.5	50.4	52.4	54.4	56.4	58.4
15	43.1	45.1	47.1	49.1	51.1	53.0	55.0	57.0	59.0
16	43.6	45.6	47.6	49.6	51.6	53.6	55.6	57.5	59.5
17	44.1	46.1	48.1	50.1	52.0	54.0	56.0	58.0	60.0
18	44.5	46.5	48.5	50.5	52.4	54.4	56.4	58.4	60.3
19	44.9	46.8	48.8	50.8	52.7	54.6	56.7	58.7	60.6
20	45.1	47.1	49.1	51.0	53.0	55.0	56.9	58.9	60.9
21	45.3	47.3	49.2	51.2	53.2	55.1	57.1	59.1	61.0

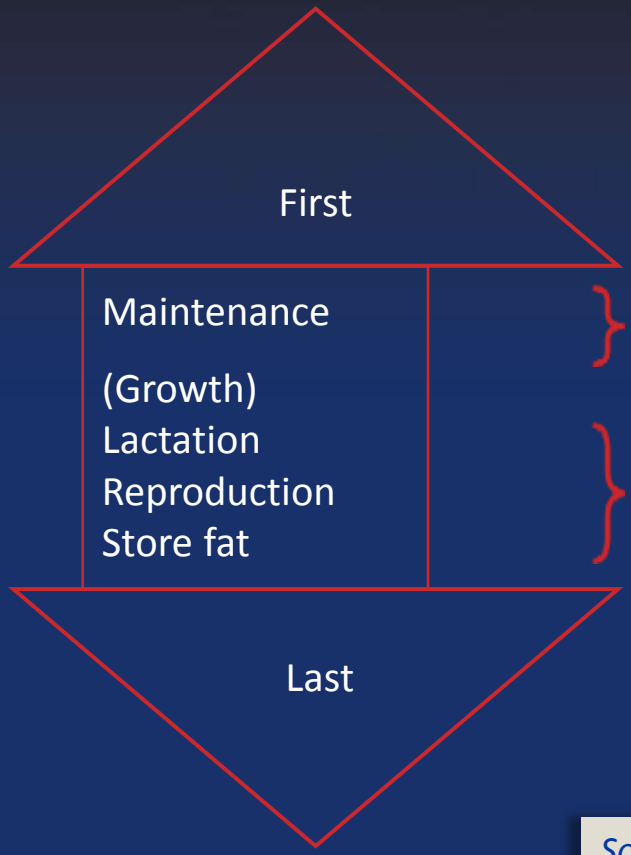
L’Equation suivante devrait être utilisée pour des taureaux âgés de 5 à 21 mois:

“Frame Score” = -11.548 + 0.4878 (hauteur) – 0.0289 (âge en jours) + 0.00001947 (âge en jours)2 + 0.0000334 (hauteur) (âge en jours).

“Frame Score” basé sur la hauteur aux hanches (pouces) pour les taureaux adultes.

	“ Frame Score”										
Âge en mois	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
24	46.4	48.3	50.3	51.3	53.9	56.0	58.0	60.0	62.0	64.0	66.0
30	47.3	49.3	51.3	53.2	54.9	57.0	59.0	61.0	63.0	65.0	67.0
36	48.0	50.0	51.9	53.8	55.5	57.5	59.5	61.5	63.5	65.5	67.4
48	48.5	50.4	52.3	54.1	55.9	58.0	60.0	62.0	63.9	65.8	67.7

Priority in the use of nutrients by beef cows



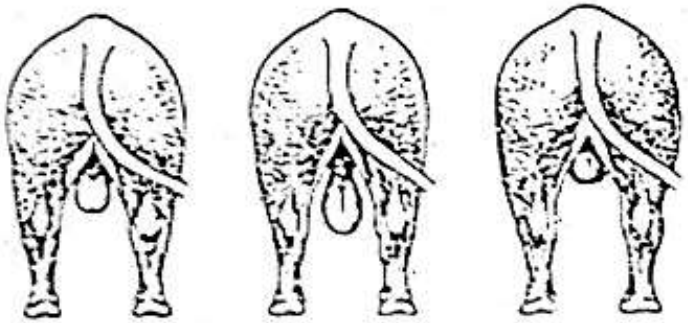
Monopolizes 70% of energy consumed

Monopolize 30 % of energy consumed

Source : Adapted from Short et al., Journal of Animal Science 1990 and American Red Angus magazine, 2002.

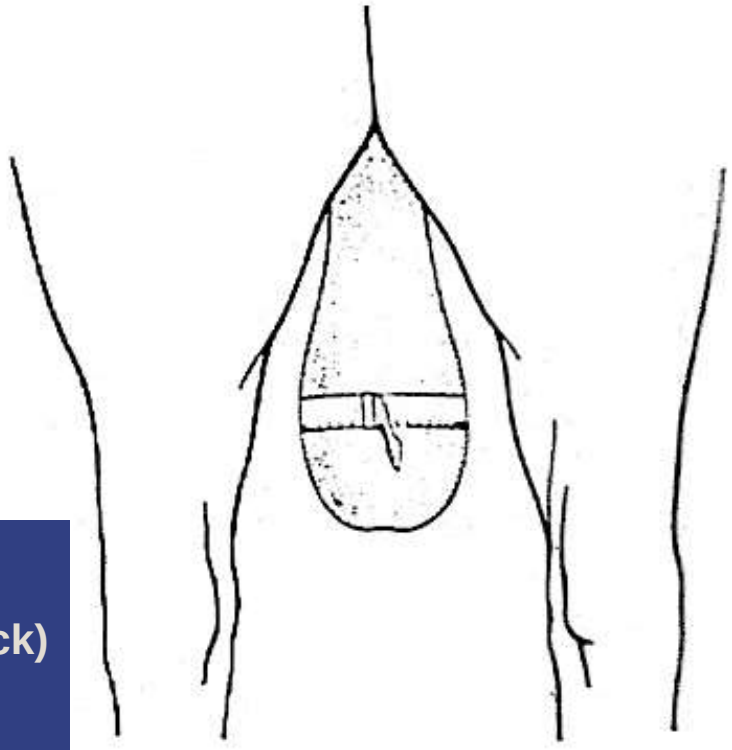
Scrotum

No	Yes	No
1	2	3



1. Straight sided (fat deposits)
2. Normal (bottle-shaped, defined neck)
3. Too close to body wall (no neck)

* #1 and # 3 impair thermoregulation



Ideal shape and where to take measurement

Scrotal size

Larger size linked to :

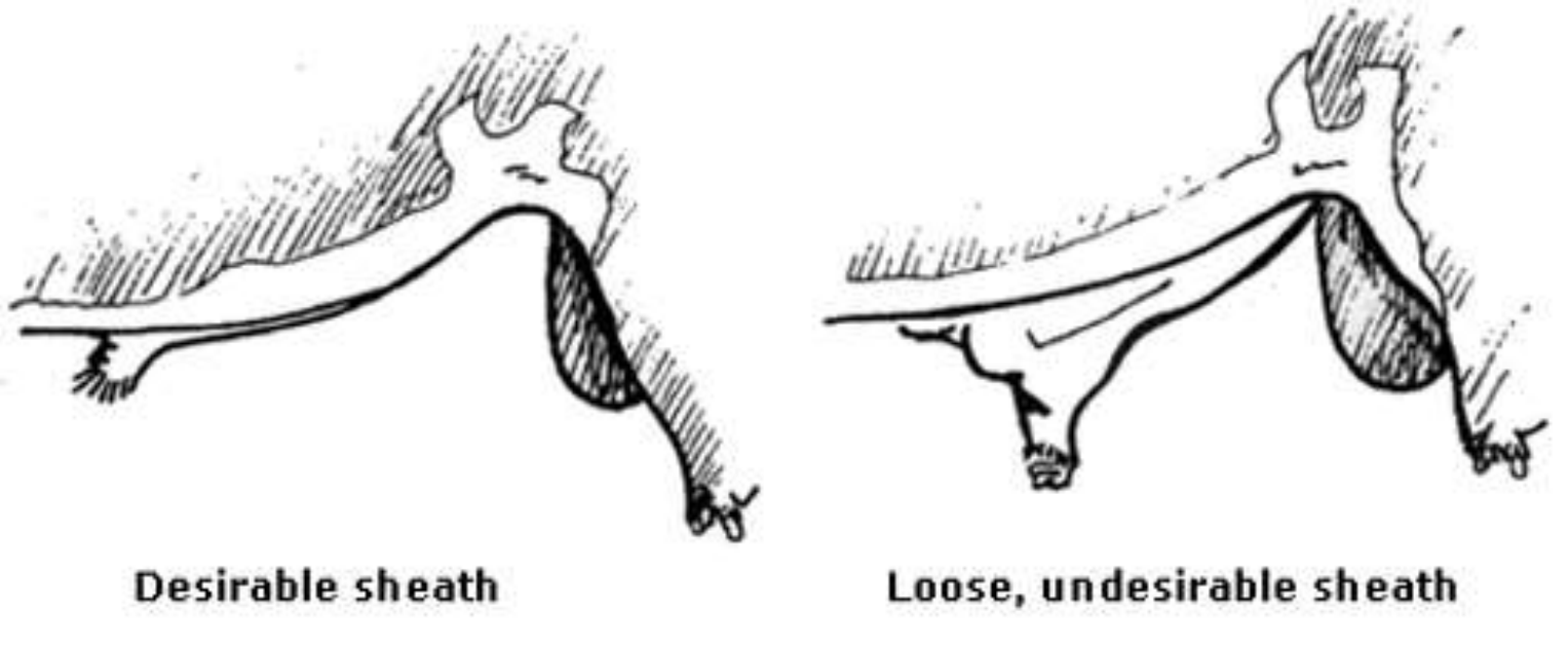
= more semen produced	= more normal sperm cells (less abnormalities)	= earlier puberty in daughters

Minimum @ 12 months :

BD/LM/SA	HP/SP	AN/CH	SM
30 cm	31 cm	32 cm	33 cm

Larger than 40 cm @ yearling = risk of testicular degeneration

Sheath conformation



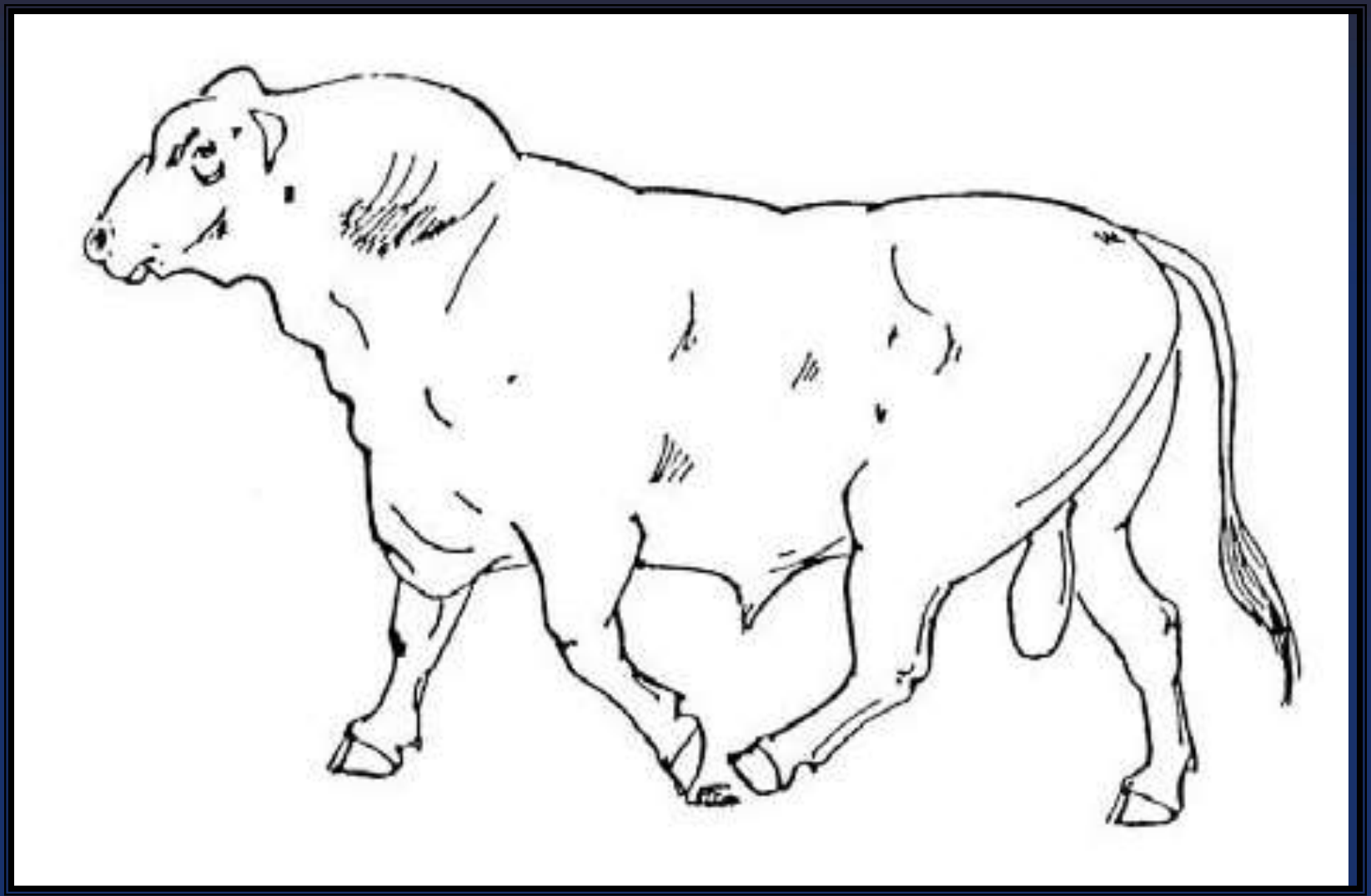
Loose sheath

Not much selection against it …
(risk of injury, infection and difficulty to mate)

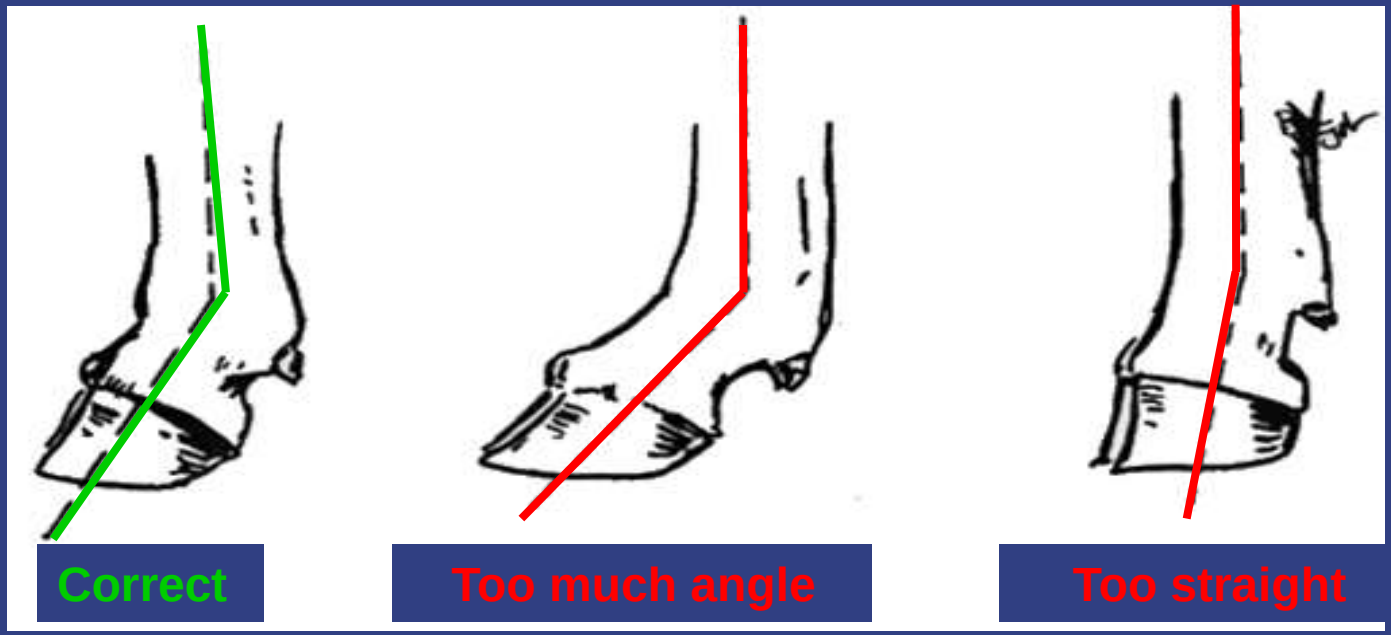
Penis prolapse …
more frequent in polled bulls
serious problem if permanently hangs out

Well shaped scrotums and sheaths

Ability to walk freely:
rear hooves should arrive in the imprints of the front feet



Pasterns



Steep pasterns = Straight legs = the worst problem
difficulty to walk (stiff, puffy hocks, small feet and short stride)
predisposed to arthritis and reduced longevity

Weak pasterns = sickled legs = abnormal hoof growth (shallow heel, long toes)
Less of a problem than being too straight

Good feet and legs structure

(left) – well spaced, well positionned (not turned out)

(right) – symetrical claws
(they should neither be too open or curl)

From the side, there should be some set to the hock
(optimal angle = 140 degrees)

Easier evaluation when the bull is walking

Capacity

- Defined by depth of body, chest width, hearth girth (correlated with muzzle width)
- Maximizes forage use thus limiting need for concentrates
- Highly correlated with growth rate and fleshing ability

Black Limousin displaying excellent capacity

Deep (side view) and wide (good space between front legs)

Side view (depth of body)

optical illusion : cattle with lots of capacity may look shorter

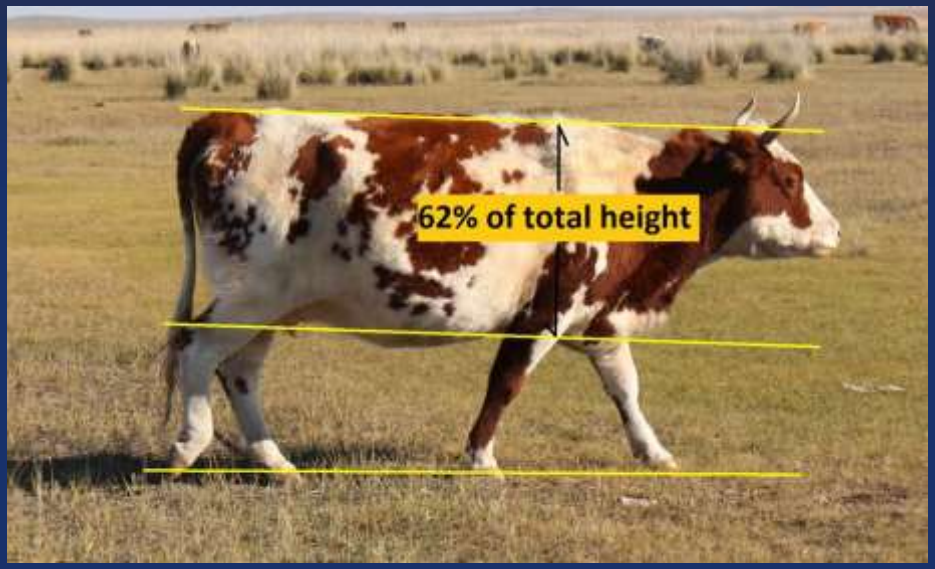
… while those lacking it may look longer !

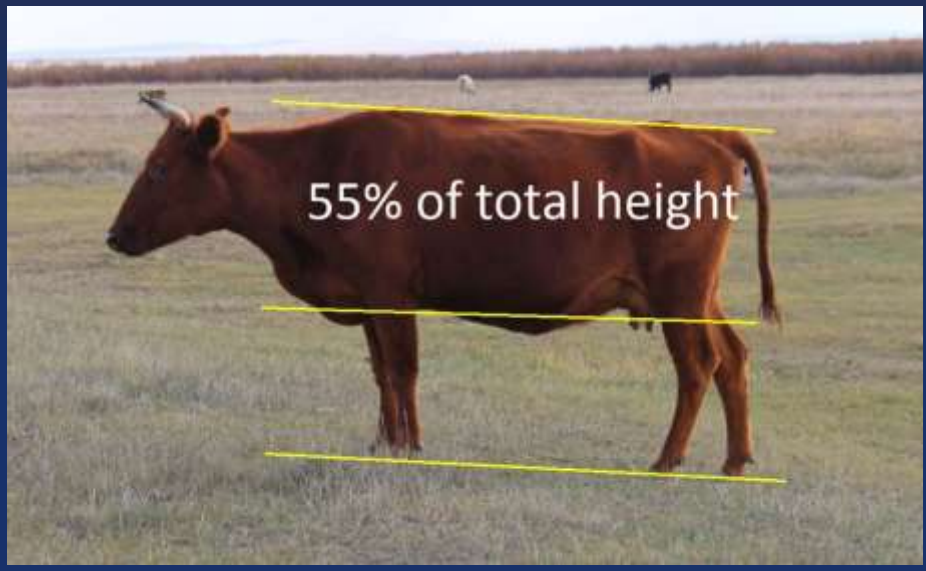
Your challenge : make a mental picture of the bull in his working clothes …
(out of the deep straw bedding and after having melted a little!)

Capacity :
easy to evaluate, even in calves
(7 months purebred Red Simmentals)

Capacity
one of the most heritable traits

(to improve it, look for body depth representing 60% + of the total height)





Good fleshing ability … not overly fat !

- Bulls offered in sales are often too fat …
- Makes light muscled bulls looking better than they are in reality…
- May affect their health/longevity due to excess weight on their immature skeleton and joints
- May (temporarily) impair semen quality and libido

Knowing how to evaluate body condition is crucial...

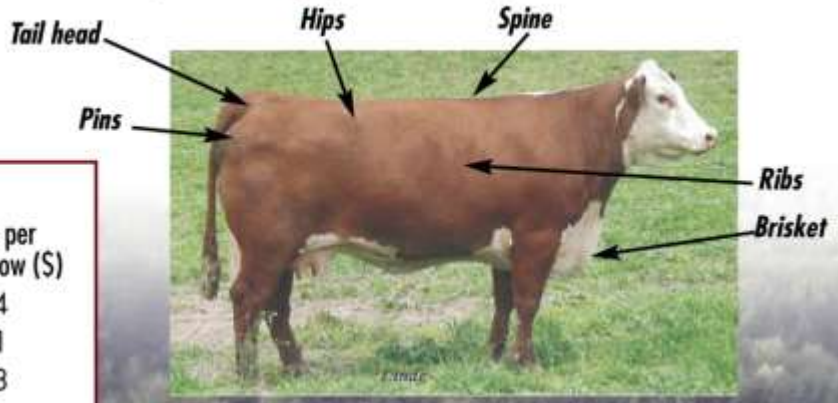
We cannot insist enough on this point since it is directly linked to the reproductive performance of your herd (Table 1). It is worth that even if the scale used to measure fleshing varies from 1 to 9 in the USA and from 1 to 5 in Canada, the principle remains the same: a "1" rating represents an animal of extreme thinness (0.5% of body fat), while the opposite rating ("5" or "9") is used to describe a highly obese animal (35% of body fat). The desirable rating at the time of calving is therefore "3" on the Canadian scale or "6" on the US scale. For heifers, it is even desirable to aim for a "3.5" (Can.) or "7" (USA). Be careful not to exceed these limits! Cows that are too fat are expensive to feed, have more calving problems and are less fertile. The ideal time to evaluate the body condition of your cows is two to three months before calving, which leaves you more than enough time to adjust the diet of the females that are either too thin or too fat.

*Table1. **Effect of body condition on performance and income***

Body condition (US)	1st heat interval (days)	Pregnancy rate (%)	Calving interval (days)	Calf weight at weaning (lb)	Income per exposed cow ($)
3	89	43	414	374	154
4	70	61	381	460	241
5	59	86	364	514	358
6	52	93	364	514	387

Source : Rick Funston, University of Nebraska, 2006.

*Figure 1. **Strategic points for body condition evaluation***



Cow in good body condition: ribs are not visible, some pressure must be applied to feel the spine, hips and pins, and there is some fat around the tail head and brisket.

Body composition ...

Which one is fat ? Which one is muscled ?

Muscled vs Fat

Muscle is round and bulging (rear, back, shoulder, forearm). It moves when the animal walks. Underline is clean, trim and well defined as there is no muscle in the lower body.

Fat is inanimate. It hangs and wobbles. Excessive finish gives a smooth look. Lower body is filled with fat. This gives a rectangular shape to the bull.

Muscling

- It is the product that we sell !
- Highly heritable, therefore easy to select for and improve
- However, meat yield has been declining for years (Canada - USA)
- Carcass weights increase … due to fat and selection for growth
- Result: less competitive compared to other protein sources

Drawback of a system based on marbling

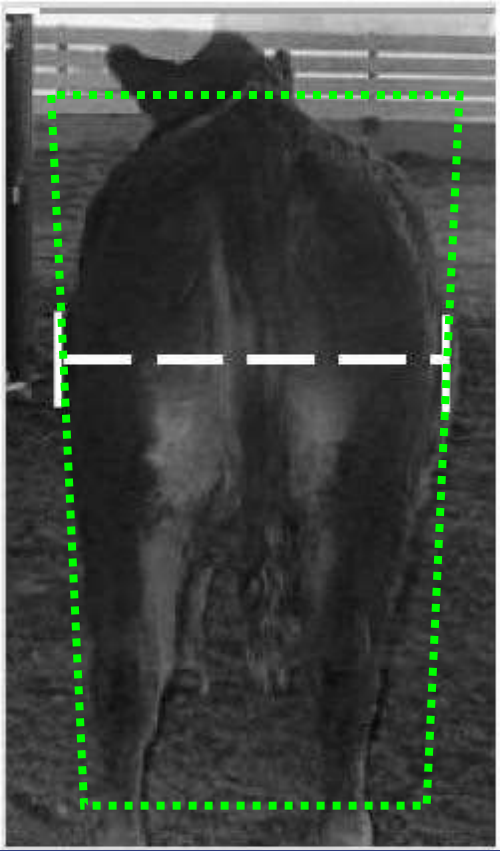
Negative genetic correlation with meat yield

↑ marbling ↓ quantity of meat in the carcass (corr. - 0,30)

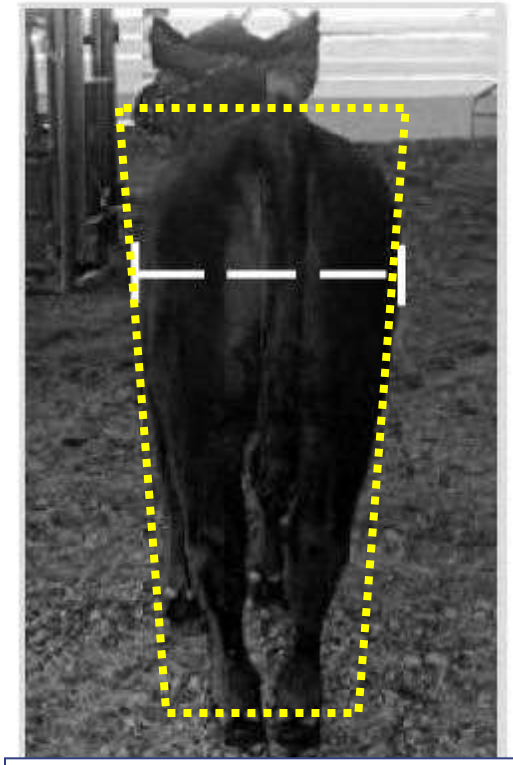
Effect of marbling selection on carcass meat yield in Canada :

	AAA	Y1 (59% et +)	Y3 (53% et -)
2005	48 %	66 %	10 %
2015	64 %	41 %	24 %
Différence	+ 16 %	- 25 %	+ 14 %

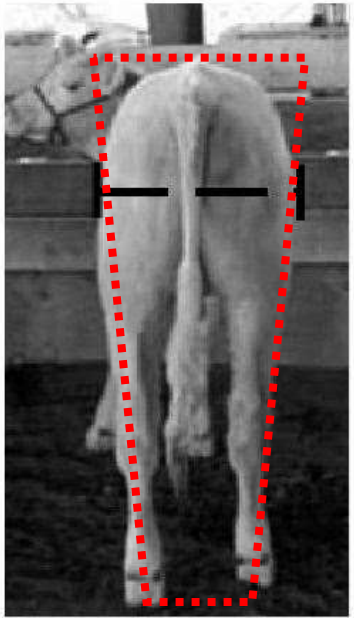
How to evaluate muscling



Thickest part is through the center of rear quarter



Thickest part is in the top
Legs are set close together



Compare how wide they stand (and walk)on their hind legs (left) : stomach visible from behind
Angular over the top (unless very fat)

Very heavy muscling :
loin muscles along the top of the animal are actually higher than the backbone

Which one is heavier muscled ?

(they have similar age and weight)

(left) : angular over topline, thinner stifle
(right) : flat and wide over topline, thicker stifle

(left) : hind quarter is shorter and flatter
(right) : hind quarter is longer and well-rounded (bulging)

(left) : top is narrower and tend to be angular
(right) : top is wide and flat

Muscle can be seen at a very young age …

(early muscle development in bulls is important if you sell calves at weaning)

Seams between muscles : a sign that does not lie !

The polled trait

Polled / Horned : how does it work ?

Very simple : only one gene pair involved

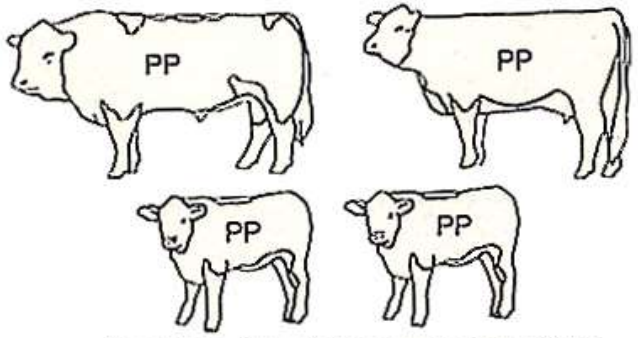
P = polled = dominant
p = horned = recessive

A calf receives one gene from each parent to make the pair

Three possible combinations … Lets say the bull is bred to horned cows :

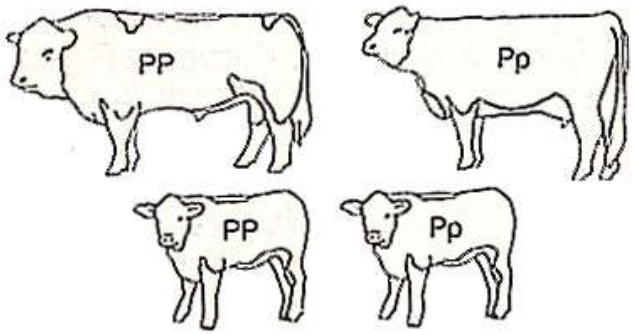
PP = homozygous polled = 100% polled progeny
Pp = heterozygous polled = 50% polled progeny
pp = 100 % horned progeny

1) Homozygous polled sire (PP) Homozygous polled dam (PP)



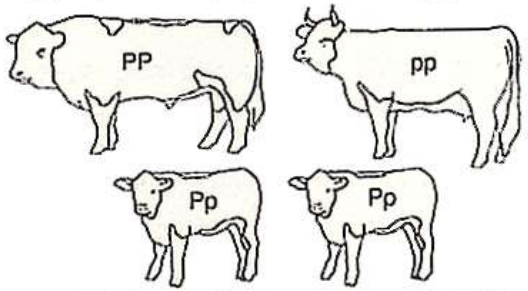
All calves will be homozygous polled (PP)

2) Homozygous polled sire (PP) Heterozygous polled dam (Pp)



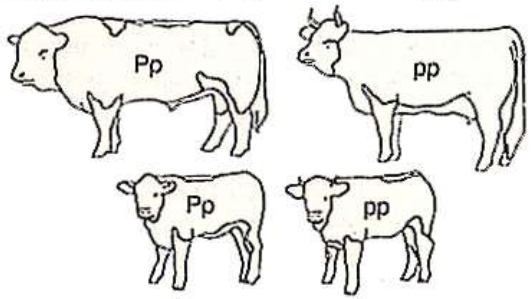
50% of calves will be homozygous polled (PP), and 50% heterozygous polled (Pp)

3) Homozygous polled sire (PP) Horned dam (pp)



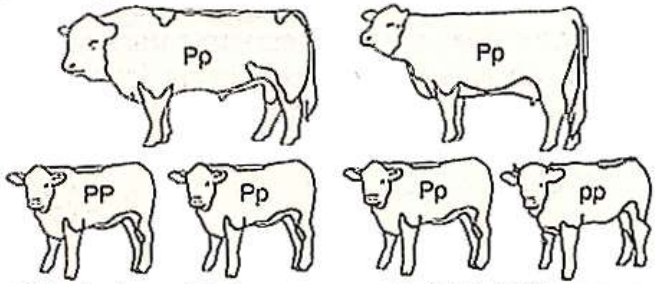
All calves will be heterozygous polled (Pp)

4) Heterozygous polled sire (Pp) Horned dam (pp)



50% of calves will be heterozygous polled (Pp) and 50% horned (pp)

5) Heterozygous polled sire (Pp) Heterozygous polled dam (Pp)



25% of calves will be homozygous polled (PP), 50% heterozygous polled (Pp) and 25% horned (pp). (Note that even though the horned calves resulted from mating two polled animals, they are genetically the same as if they were from horned parents.)

Understanding Scurs

Concevons l'avenir

What about the scurs ?

- Independent of the polled/horned gene
- Horned cattle can be carriers … but obviously can't express them
- Sex-linked :
- dominant in males - will appear if one gene present
- Recessive in females - will appear if two genes present
- Do not appear before calf is 4 months old (sometimes 12 months)

What about the scurs ?

- Loose and movable, they are not attached to the skull
- Variable size : from small buds to (almost) as large as horns
- Never appear in homozygous polled cattle … don't know why
  (but can be carriers and transmit them)
- Then, scurred cattle are, by deduction, heterozygous polled
- Currently no genomics tests to identify carriers

Docility … a picture is worth a thousand words !

Bad temperament impacts:

Growth :

↓ 0.25 lb/day (Oregon 2009)

Carcass

↓ tenderness, ↑ dark cutters, bruises

Reproduction

Conception heifers ↓ 8,4% (Wash. 2014)

Health

↑ cortisol = ↓ immunity

Pigmentation (around the eyes and eyelids)

More sensitive to UV rays
- cancer eye, pinkeye -

Less sensitive to UV rays

Before buying a new bull,
do you make it a point to evaluate his dam ?

a) never
b) if I get the opportunity
c) always

Evaluation of the bull's dam
(and ideally of his grandam and sisters)

- Very important if you intend to raise his daughters

- <u>Elements to consider :</u>
  - Size
  - Fleshing ability
  - Udder
  - Feet and legs
  - Longevity of the family in the herd
  - Production records (calving interval ? quality of calves ?)

➢ **Is it the kind of cows I want in my herd ?**

Which one is the dam of your next herdsire ?
Heritability for udder traits = 30%
Her son will leave you with many daughters …

Dam evaluation provides a lot of relevant infos …

Is she a productive brood cow ?

A visit allows to see her current calf, kind of management, etc

She's old ? … it can be an advantage

It means she has done everything right

longevity = absence of problems / no reason to cull

Which breed to choose ?

- depends on your needs : maternal or terminal

- depends of your herd's genetic composition
  (objective should be to increase/maintain high degree of hybrid vigor)

- you get maximum heterosis when an animal is no more than 50% of a specific breed

- ex. heterosis is 100% in a ½ AN ½ SM female. If you breed her back AN or SM, heterosis will drop to 50% in the resulting calf because he's getting closer to purebred status (75%)

Cows with higher genetic diversity (crossbred) average $162.00 greater net annual returns ($74.00 higher income per weaned calf and $88.00 per head lower replacement costs)

Source : Dr. John Basarab, Alberta Agriculture – Cattlemen magazine, May 2018

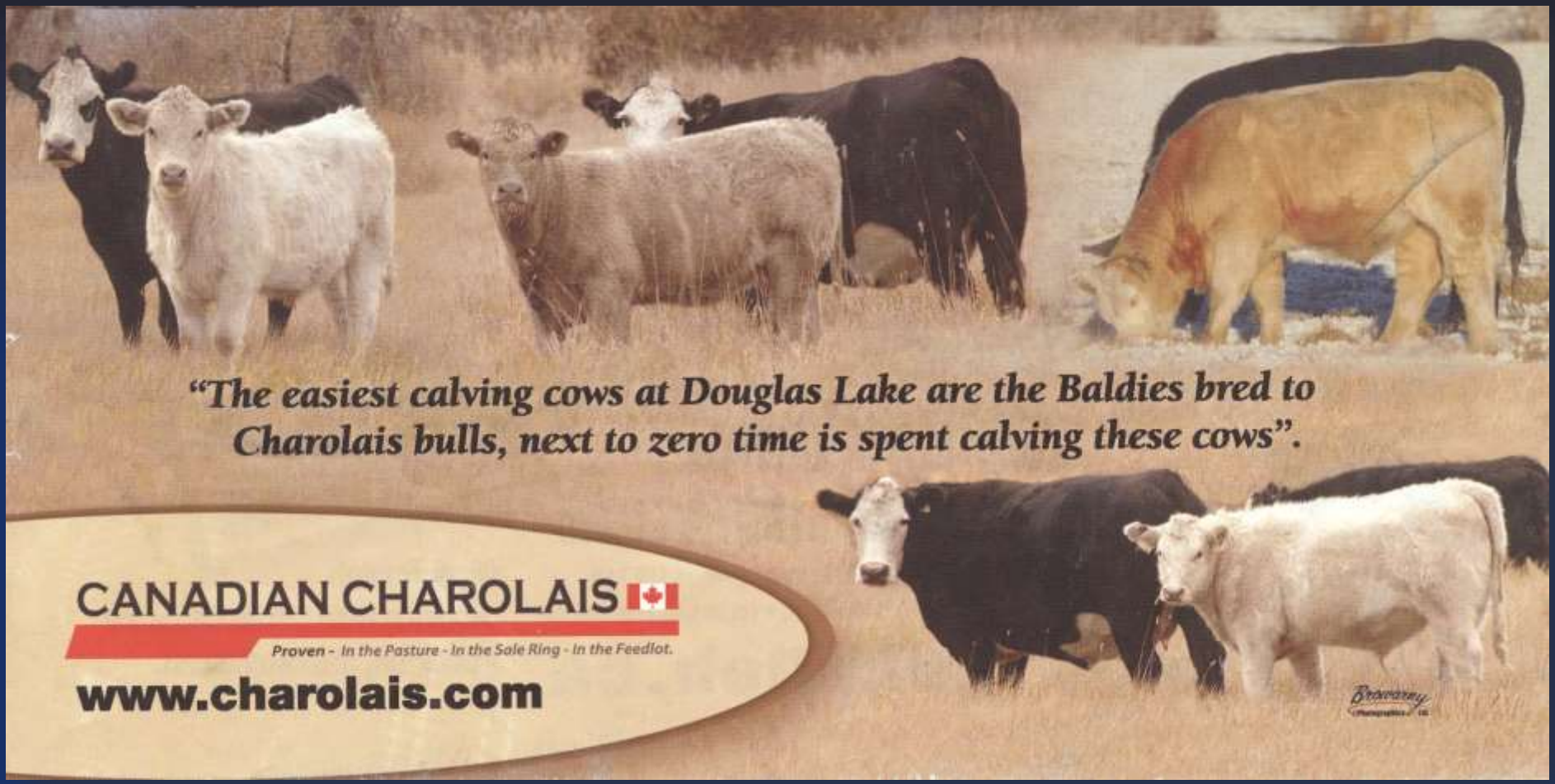
Hybrid vigor, it's real !

Purebred Angus,
an excellent mother cow, but …

Hereford/Angus hybrid:

- **Fertility + 7 %**
- **Longevity + 16 %**
- **Lifetime production + 30 %**
- **Production costs – 10 %**

Angus / Hereford cross cows with Charolais calves…



Develop an effective breeding plan … and stick to it !

A maternal cross to reduce costs (low maintenance)

A terminal cross to maximize income (growth and muscle)

Hereford / Shorthorn cow with Limousin calf

On average, how much do you pay for your bulls ?

- a) $2 000
- b) $3 000
- c) $4 000
- d) $5 000
- e) more than $5 000

How much should you pay for a « good » bull ?

- Old rules of thumb exist that allow us to estimate the value of a bull according to market conditions :

- 5 times the value of a 550 lb feeder calf (ex. 5 X (550 lb X $2.10) = $5 800)
- 2 times the value of a fat steer (ex. 2 X (900 lb carc. X $2.60) = $4 700)

- In the current market, you should be ready to pay around **$5 000**

If not, A.I. offers you unbeatable value for money !

- If you're not ready to make « your homeworks »
- If you hesitate to invest the required amount
- If you need several bulls