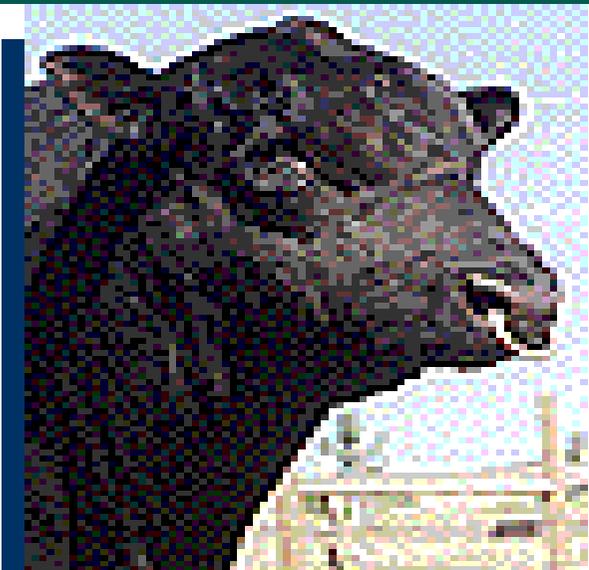


9^{ième}
Journée Bovine
6 juin 2003
*« Le Bœuf toujours
en progression »*



Une présentation de:
LABORATOIRE G.M.F. inc.
1-800-363-1339
450-796-4772

Bull management and factors affecting performance

Albert Barth, Western College of Veterinary Medicine



Our seasons play a large
role in why and how we
manage our herds



Short breeding season (63d)



Advantages of a short breeding season

- Short calving period
- Uniform calves at weaning
- Management efficiency of calves and cows

Uniform calves

Vaccination, castration, weighing, feeding, selling

Replacement heifer selection

All of similar age

Cow management

Vaccination, breeding observation, estrus synchronization, AI, pregnancy testing, culling on performance, nutritional management

A survey of 2713 cow-calf producers in
North-central Alberta - Basarab, 1987

Decreasing the length of the calving season
was the best opportunity for increasing profit

Requirements of a short breeding season

Highly fertile cows

Highly fertile bulls



The 4 major determinants of profitability are:

- % calves weaned per cows exposed to bulls
- Weaning weight
- Production costs (feed, fuel, vet, labour, etc.)
- Calf selling price

Getting them pregnant

Factors determining the number of cows showing estrus early and conceiving on first service Wiltbank, 1987

Estrus in 1st 21 days

1. Time of calving
2. Body condition at calving
3. Age (1st calf heifers)

Conception at 1st service

1. Time of calving
2. Weight change near breeding
3. **Bull fertility**

“Bulls classified as satisfactory breeders achieved a 9% higher pregnancy rate than bulls of questionable breeding status.”

Farin et al, 1989

Economic loss due to subfertile bulls

For every 21 day period of the breeding season that a cow remains open, there is a loss of ~25 kg of weaning weight the following year for the calf she finally conceives

70% vs 50% 1st service pregnancy rate, 40 cows

Satisfactory bull (70%)

Pregnancy rate (92%)

$$28 \times 275 \text{ kg} = 7700$$

$$8 \times 250 \text{ kg} = 2000$$

$$1 \times 225 \text{ kg} = \underline{225}$$

9925

Questionable bull (50%)

Pregnancy rate (85%)

$$20 \times 275 \text{ kg} = 5500$$

$$10 \times 250 \text{ kg} = 2500$$

$$4 \times 225 \text{ kg} = \underline{900}$$

8900

Difference = 1025 kg total weaning weight

Tools producers use for choosing bulls

1. Pedigree (breeder reputation)
2. Record of Performance
3. EPD (expected progeny difference)
4. Visual inspection



5. Breeding Soundness Evaluation

Prevalence of Infertile Bulls

Most studies: 1 in 5 bulls is less than satisfactory
(Based on physical inspection and semen analysis)

Melfort research station results 209 mature bulls
(Based on serving capacity, physical and semen)

Satisfactory	72.2%
Questionable	12.0%
Unsatisfactory	15.8%

The Cardinal Principles of Breeding Soundness

1. Normal Serving Capacity
(physical ability and libido)
2. Physical soundness (scrotal circumference)
3. Good semen quality

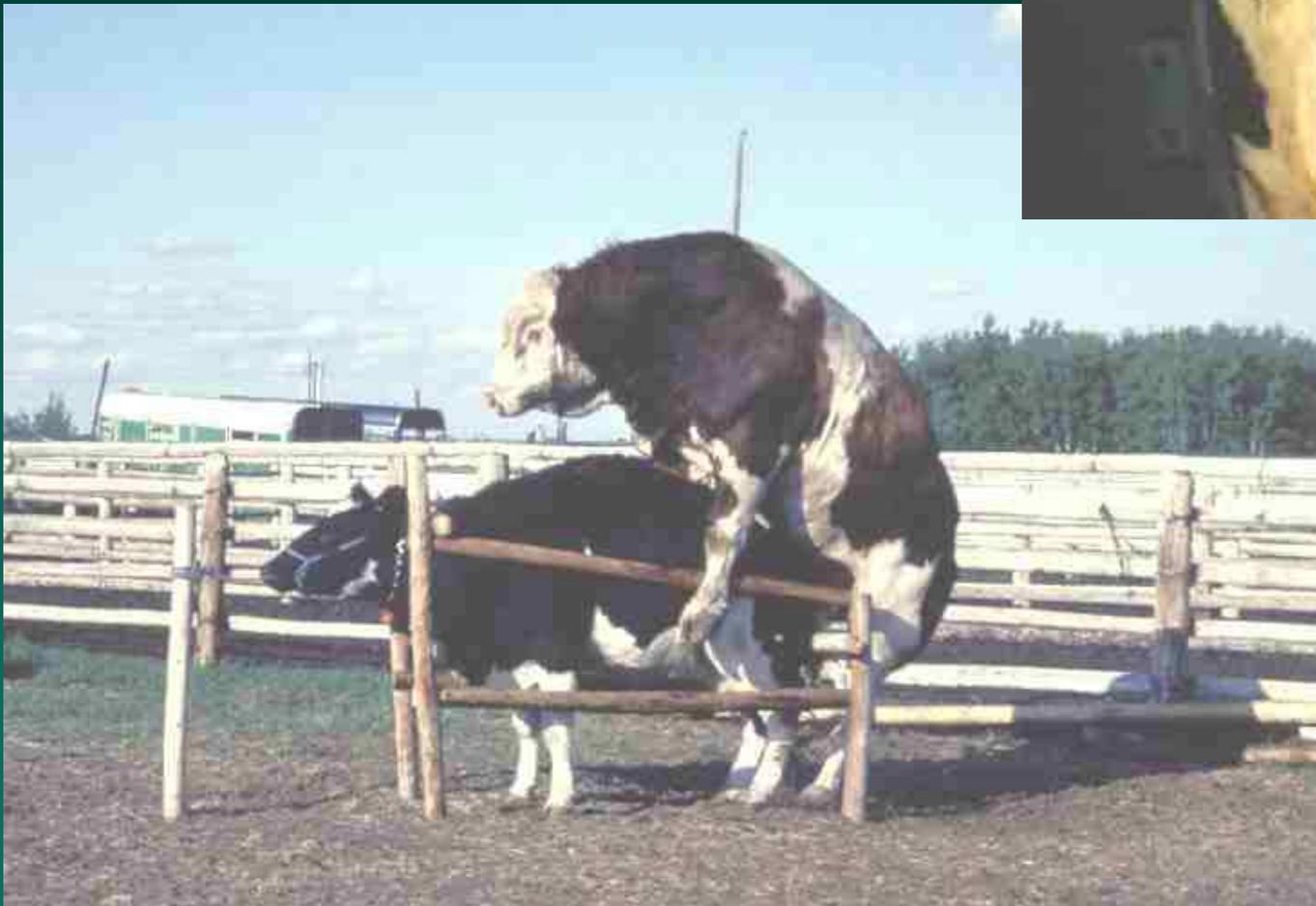
1. Serving Capacity (not evaluated by the veterinarian)







2. Physical Soundness



In 2110 bulls tested at WCV
22.1% had at least one physical abnormality



Corkscrews - untrimmed and trimmed

Interdigital fibromas



Posty legs



Puffy hocks





Normal scrotum

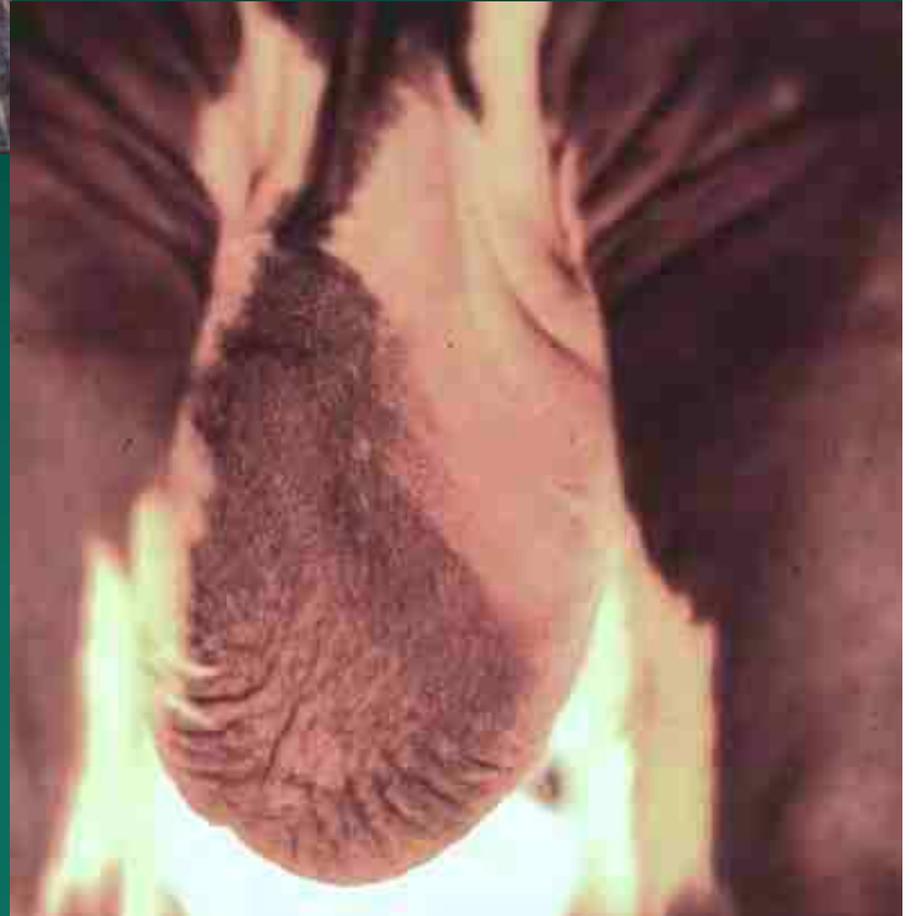
Short scrotum





Obesity

Testes abnormalities



Scrotal circumference

(an important part of the part of the physical examination)



Scrotal Circumference is highly correlated to:

- Paired testes weight 0.95
- Daily sperm production 0.62-0.75
- High semen quality 0.47-0.64
- Onset of puberty in bulls 0.75
- Onset of puberty in heifers 0.71 - 0.98
- Pregnancy rate 0.58 -0.66
- Female lifetime productivity 0.66 - 0.97

Heritability of Scrotal Circumference = 0.68

How repeatable are scrotal circumference measurements?

- Body condition
- Temperature
- Differences in method of SC measurement:
(tape tension, forcing testes down in scrotum)
- Yearling bull SC increases 1.5 to 2 cm per month

3. Semen Quality



Effect of seasonality on bull fertility

Factors affecting breeding soundness classification

AD Barth and CL Waldner Can Vet J April 2002



Effect of month on percentage of bulls with a satisfactory BSE or satisfactory semen quality

	% all bulls Satisf BSE	% all bulls Satisf Semen	% normal bulls Satisf Semen
Jan	49	55	66
Feb	46	48	58
Mar	62	67	76
Apr	68	72	82
May	73	76	87
June	68	75	88
July	66	72	91

Effect of body condition on BSE classification in 1635 physically normal bulls

	Body condition score on scale of 1 - 5				
	2	2.5	3	3.5	4
Jan - Dec	63.6 ^a	76.1 ^b	80.9 ^b	82.1 ^b	47.6 ^c
Jan - Mar	52.6	60.0	70.0	77.8	47.6
Apr - Jun	70.0	80.0	85.5	84.1	49.4

Semen quality in bulls with a BCS of 2.0 - 3.5 improved significantly between the 1st and 2nd quarter of the year

Age relationship with scrotal frostbite

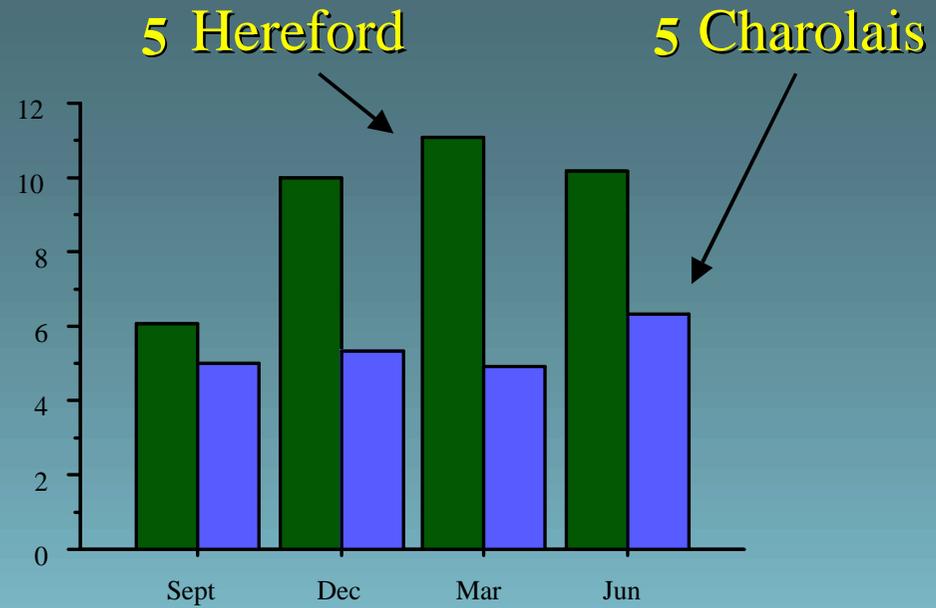
- Frequency of frost bite increased significantly as age increased
- 5 and 6-year-olds were 4.3 times as likely to have frost bite as 2-year-olds

Bedding and shelter
may be more important
for older bulls

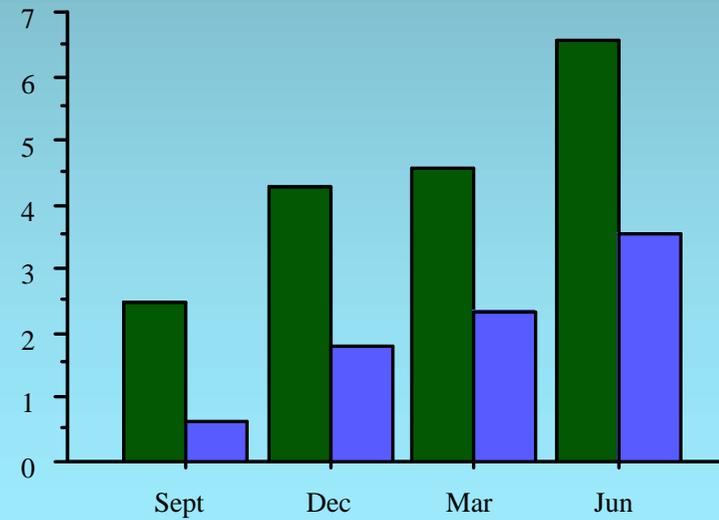


Effect of season in bulls on:

LH



Testosterone

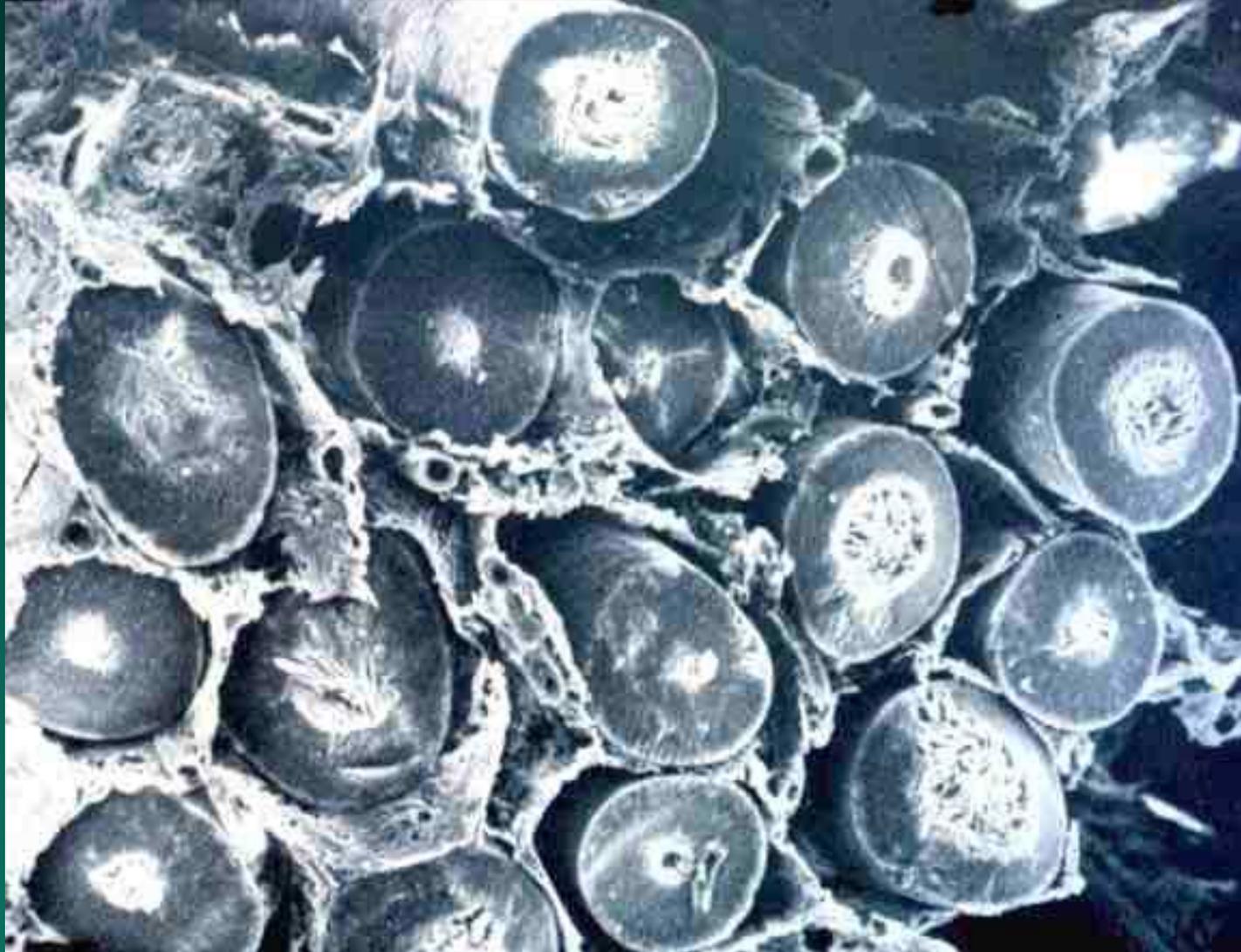


Conclusions

- There is a strong effect of season on bull fertility
- Winter can be tough on bulls, feed, bedding, shelter
- It seems likely that photoperiod is involved
- Move semen testing towards late spring if possible

Understanding yearling bulls





2 months of age



4 months of age

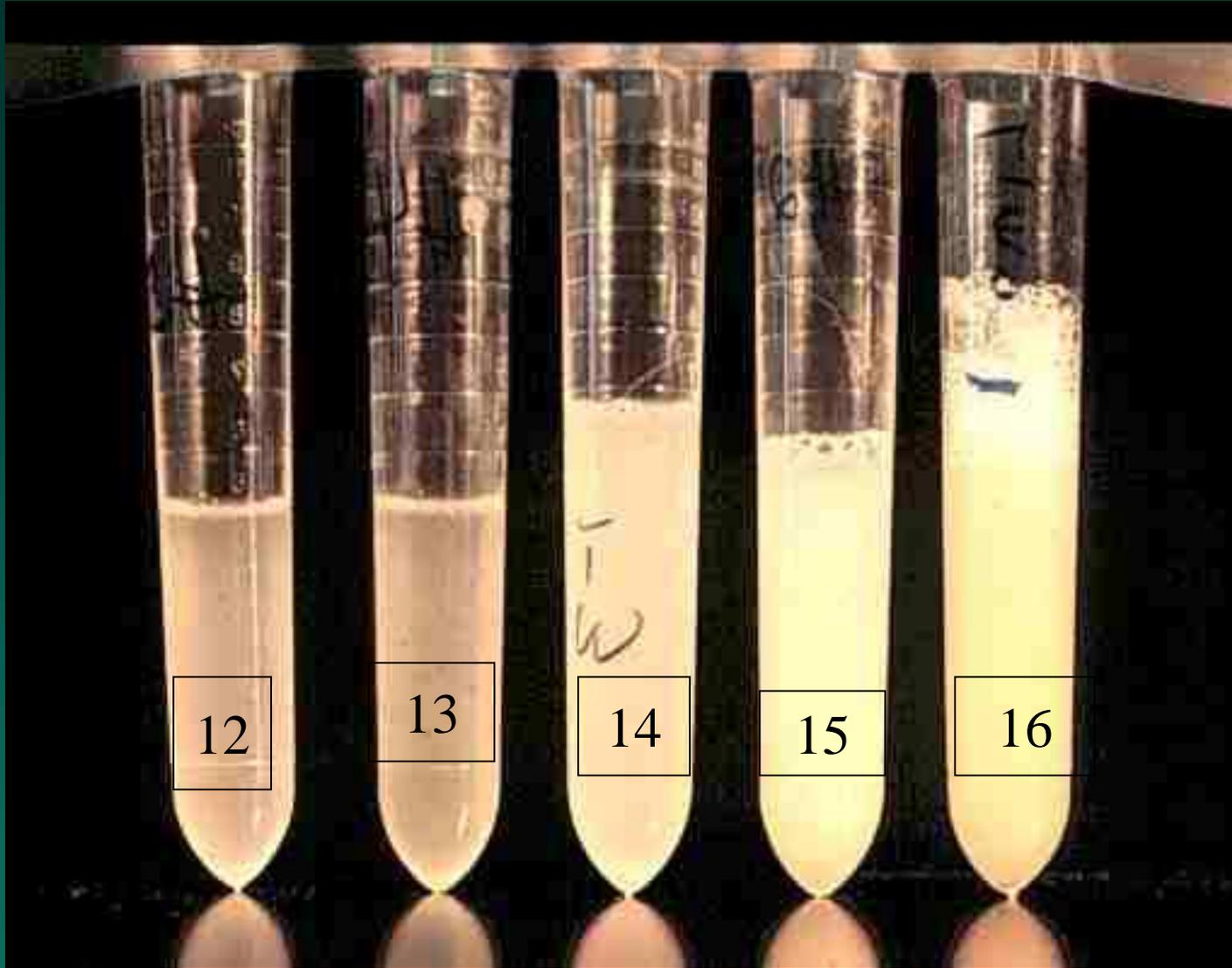


6 months of age



9 months of age





12

13

14

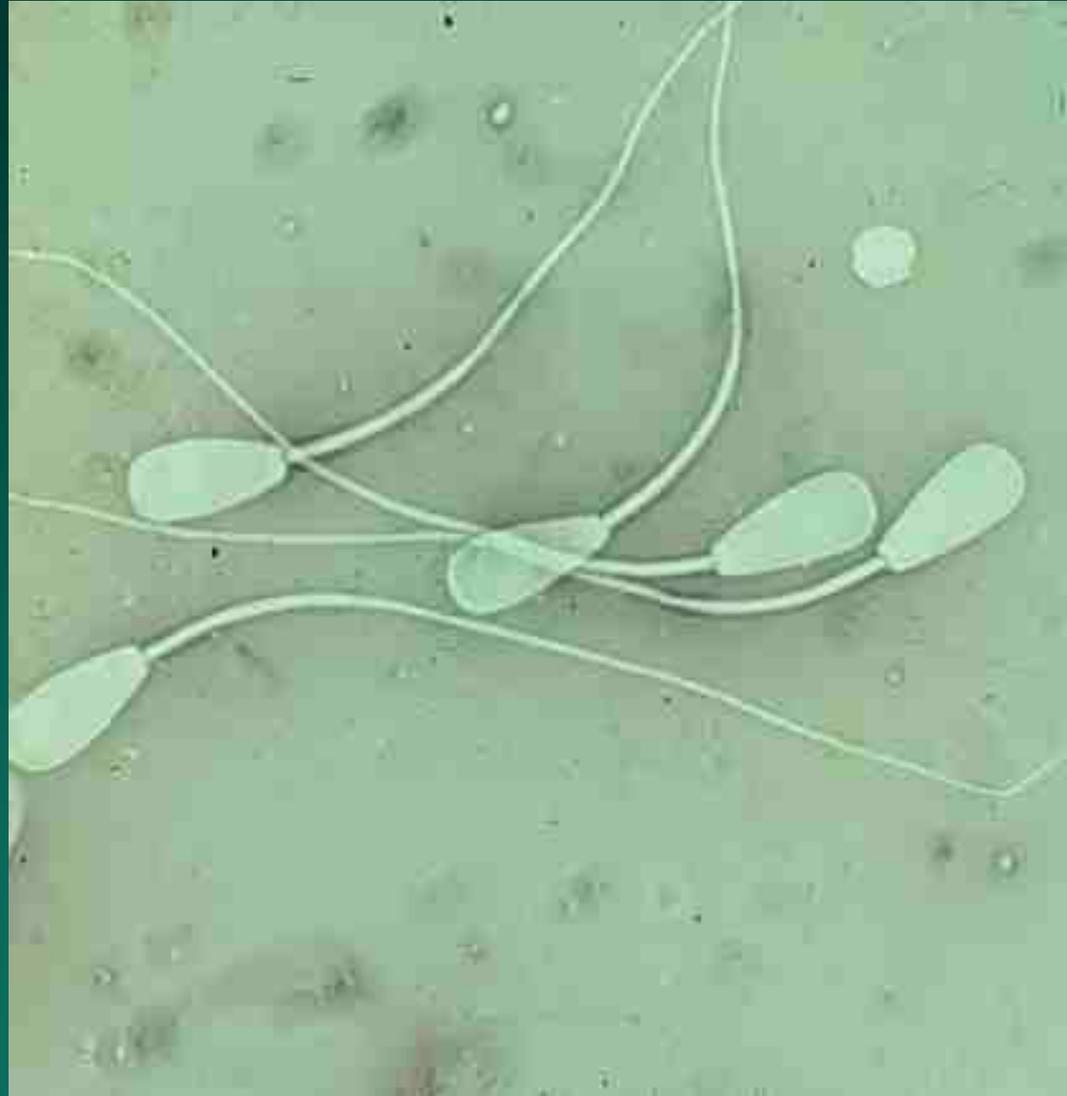
15

16

11 -12 mo old



14-16 mo old



Ranges in age of onset of puberty in Bulls of various breeds

Breed	Age (days)	Author
Hereford	273-364	Wolf et al, 1965
Angus	273-350	
Holstein	252-343	Killian, 1972
Charolais	231-371	Almquist et al, 1976

ROP bulls with satisfactory semen quality (Age of maturity) Cates 1972-1981

Age (mo)	Satisfactory semen	Scrotal circumference
12 mo	33%	34 cm
14 mo	60%	35 cm
16 mo	95%	36 cm

ROP bulls with satisfactory semen quality (Age of maturity)

Arteaga, Barth, 2001

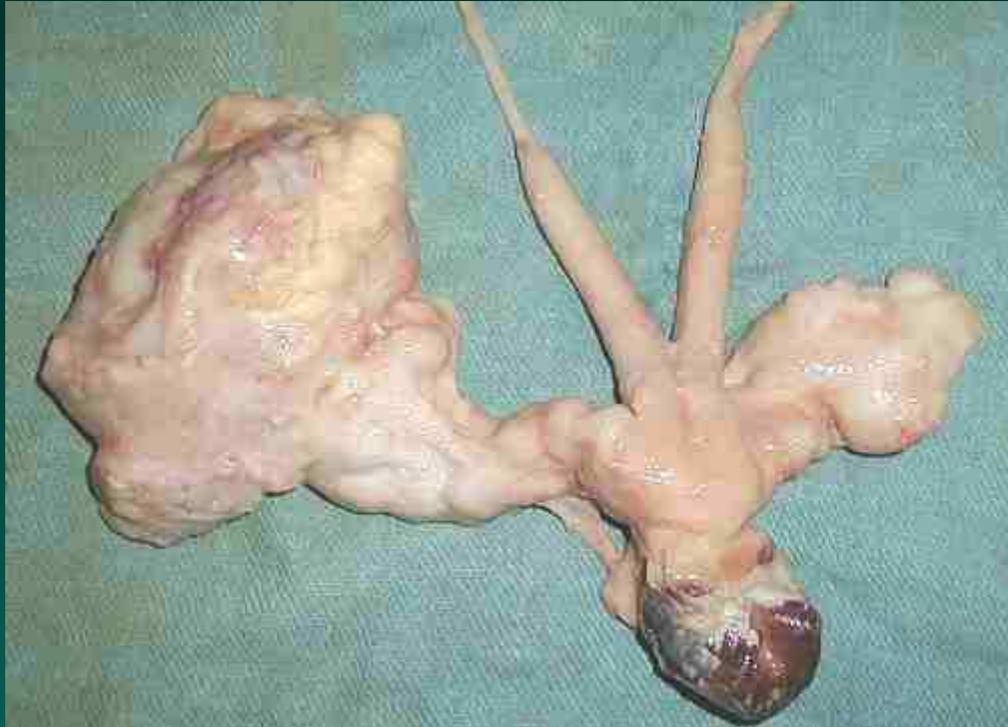
Age (mo)	Satisfactory semen	Scrotal circumference
12 mo	30 %	34.4 cm
14 mo	51 %	35.8 cm
15 mo	62 %	35.3 cm

Pregnancy rate for 1 vs 2-y-old bulls
10 years, 60d breeding seasons, BFR of 1:20

University of Alberta, Farid, 1987

Bulls	Herds	Cows	Pregnant	Calves Born	
				1st 4 wk	1st 6 wk
14 mo	31	665	83.9%	57%	78%
26 mo	31	650	82.5%	64%	83%

Why do so many yearling bulls fail ?



Vesicular gland
infection

Pus in semen



Failure to serve cows



Laminitis





Ylva Persson
Uppsala, SWEDEN

Joint lesions in Record of Performance bulls in Sweden

L Soderquist and Y Persson

475 Simmental, Charolais, Limousin and Angus bulls

115 bulls sent to slaughter

30 bulls joints recovered

87% had at least one joint with osteochondrosis

Most are not overtly lame

Osteochondrosis is recognised in other species to be associated with very rapid growth rates

Why do performance test stations push bulls so hard?

You can not compare growth between stations



??s