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# Suckled Calf Production



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(Presentation © S P Marsh)

# Suckled Calf Production

- Targets
- Calving season
- Choice of breed & replacement strategy
- Body Condition Scores
- Compact calving
- Creep feeding



# Suckled Calf Production

- 1.59mn suckler cows in the UK (~50% in lowlands)
  - Herds tend to calve in either spring or autumn
  - 94% are cross-bred and ~35% of cows are dairy-bred beef crosses i.e. Limousin x Holstein-Friesian
  - ‘Hardy’ (native) suckler cow breeds in the hills
  - Majority of suckler cows are put to Continental bulls
  - Increasing number of suckled calf producers are now breeding their own replacements
  - Calves weaned @ 7-10 months old and either sold as stores or finished ‘on farm’



# FOUR IMPORTANT PERFORMANCE TARGETS

- 1 calf from every cow every 365 days
- A compact 9 week calving period
- High calf weaning weights (1.2+ kg DLWG)
- Efficient utilisation of forage and manipulation of body condition score



# Targets for suckled calf production

	Autumn calving	Spring calving
Calving period (weeks)	9	9
Calves reared per 100 cows	94+	94+
Calf (bulls & heifers) DLWG (kg)	1.2	1.3
Calf suckling period (months)	10	7
Calf sale wt (kg)	400	320

(Allen 1990, QMS 2006 & Marsh 2011)



# Targets for suckled calf production

	Autumn calving	Spring calving
<b>Silage (tonnes)</b>	7.5	5.5
<b>Cow concentrates (kg)</b>	240	50
<b>Calf concentrates (kg)</b>	200	100
<b>Stocking rate (cows/ha)</b>		
<b>Lowland</b>	2.0	2.5
<b>Upland</b>	1.5	2.0

(Allen 1990)



## Profitability linked to:

- Good reproductive performance
- Low mortality
- High calf DLWG's
- High calf sale price
- Low fixed cost structure
- 'Easycare' systems



# Calving Season

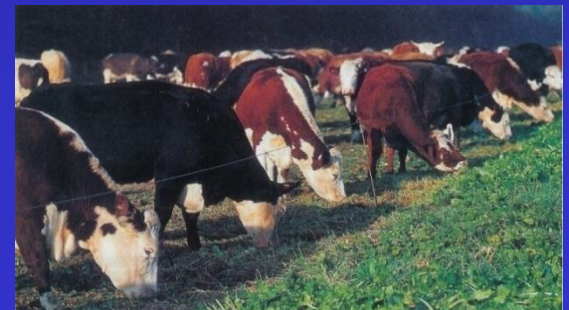
- Spring
- Summer
- Autumn
- Winter





# Spring calving - Advantages

- 'Natural' time to calve and grass growth matches the 'lactation curve'
- Control of cows nutrition pre-calving
- Good supervision of calving (indoors). Cows turned out ASAP after calving
- Good quality grazing available in early lactation
- Improving cow condition at bulling
- Flexible weaning date
- Low winter feed costs (use low quality roughage for dry cows)
- Suits out-wintering systems



## Spring Calving - Disadvantages

- Calving coincides with lambing
- Fertility sensitive to summer grass growth
- Risk of pneumonia with calves post weaning
- Small calf for autumn suckled calf sales (not relevant for lowland herds that usually finish their calves)
- Difficult to finish calves off grass at 18 months old



Spring born calves @ 250kg



# Autumn calving – advantages

- Outdoor calving?
- Full control of cow feeding during mating
- Facilitates the use of AI
- Heavier calf for the autumn suckled calf sales compared to spring calving
- Flexible weaning date
- Calves easily finished 'out of yards' at 18-20 months old



**Autumn born calves @ 350kg**

## Autumn calving – disadvantages

- Difficult to control cow feeding/condition pre-calving
- Calving coincides with autumn harvest/cultivations
- Need to ensure a good plane of nutrition at bulling during the winter
- Possible problems with summer mastitis
- Housing for cows and a creep area for calves required
- Pneumonia and scour risk in young calves
- Not suited to out-wintering systems



# Summer calving

## Advantages

- Good weather at calving



## Disadvantages

- Cows often in high body condition score pre-calving and hence possible dystocia problems
- Declining grass quality at bulling
- Calves too young to wean at housing in the autumn
- High winter feed costs



# Winter calving

## Advantages

- None - apart from pedigree herds wanting to calve in January!!



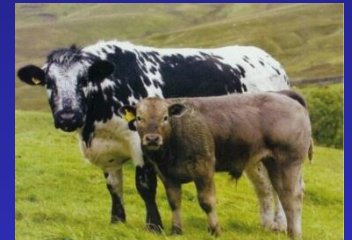
## Disadvantages

- Combines disadvantages of spring and autumn calving
- High winter feed costs
- Indoor calving and bulling could lead to higher calf mortality and poor cow fertility respectively

**‘Whichever calving season is chosen it must suit the resources of the farm’**

# Choice of bull and cow

- 'Easycare breeds/systems' and focus on ease of calving
- Choice of cow breeds for Lowland and LFA systems
  - Continental/Native for the Lowlands
  - Native & 'Selected Continental' breeds for the uplands
  - Native British breeds for the hills
- Hybrid vigour & replacement policy
  - 'Three way cross' maximises hybrid vigour (23% increase in performance compared to pure-breds)
  - Homebred or purchased replacements?
  - Use EBV's



# Choice of breed of Bull

The choice of bull is dependent on a number of factors:



(i) Assisted calvings & mortality

	Assisted calvings (%)	Calf mortality (%)
Charolais	9.6	4.8
Simmental	9.3	4.2
Limousin	7.2	4.4
Hereford	3.8	1.6
Angus	3.1	1.3

NB: There is more variation 'within a breed than there is between all the beef breeds'

(Source: Allen 1990)



## (ii) Calving ease & gestation length

Breed	Ease of calving (%)	Gestation Length (days)
Blonde d'Aquitaine	4.9	289
Charolais	4.6	287
Simmental	3.3	286
British Blue	3.0	283
Limousin	2.4	288
Angus	1.5	282
Hereford	1.3	283

(Source: Genus 2006)



### (iii) Calf sales

- depends on calf weight (kg) and price per kg

Calf 200 day wts (kg)	Lowland Herds	Hill Herds
Charolais	240	205
Simmental	232	198
Limousin	225	186
Hereford	201	184
Angus	194	176



(Allen 1990)

## (ii) Calf sale values

- depends on calf weight (kg) and price per kg

Calf 200 day wts (kg)	Lowland Herds	Hill Herds	S Frost (HAU/FW Focus Farm)
Charolais	240	205	336
Simmental	232	198	
Limousin	225	186	
Hereford	201	184	
Angus	194	176	



(Allen 1990)

# Choice of bull

Use EBVs to select bulls with a high Index with good locomotion and functionality

The majority of suckler herds use Continental bulls as the terminal sire and an 'easy calving' bull on heifers

Calves sired by Angus and Hereford bulls need to be marketed through a Premium beef scheme i.e. Waitrose via Dovecote Park abattoir

The majority (approx 90+%) of suckler cows are put in-calf by natural service



**Charolais**



**Limousin**



**Angus**

# Breed of Cow



- Traditionally small hardy breed used i.e. Blue Grey
- In the lowlands and uplands the majority replaced by Hereford and Angus x Friesian in the 1960's
- The most popular breed of suckler cow is now the Limousin cross
- A 'three way cross' maximises hybrid vigour
  - i.e. Charolais x Limousin/Holstein-Friesian etc....



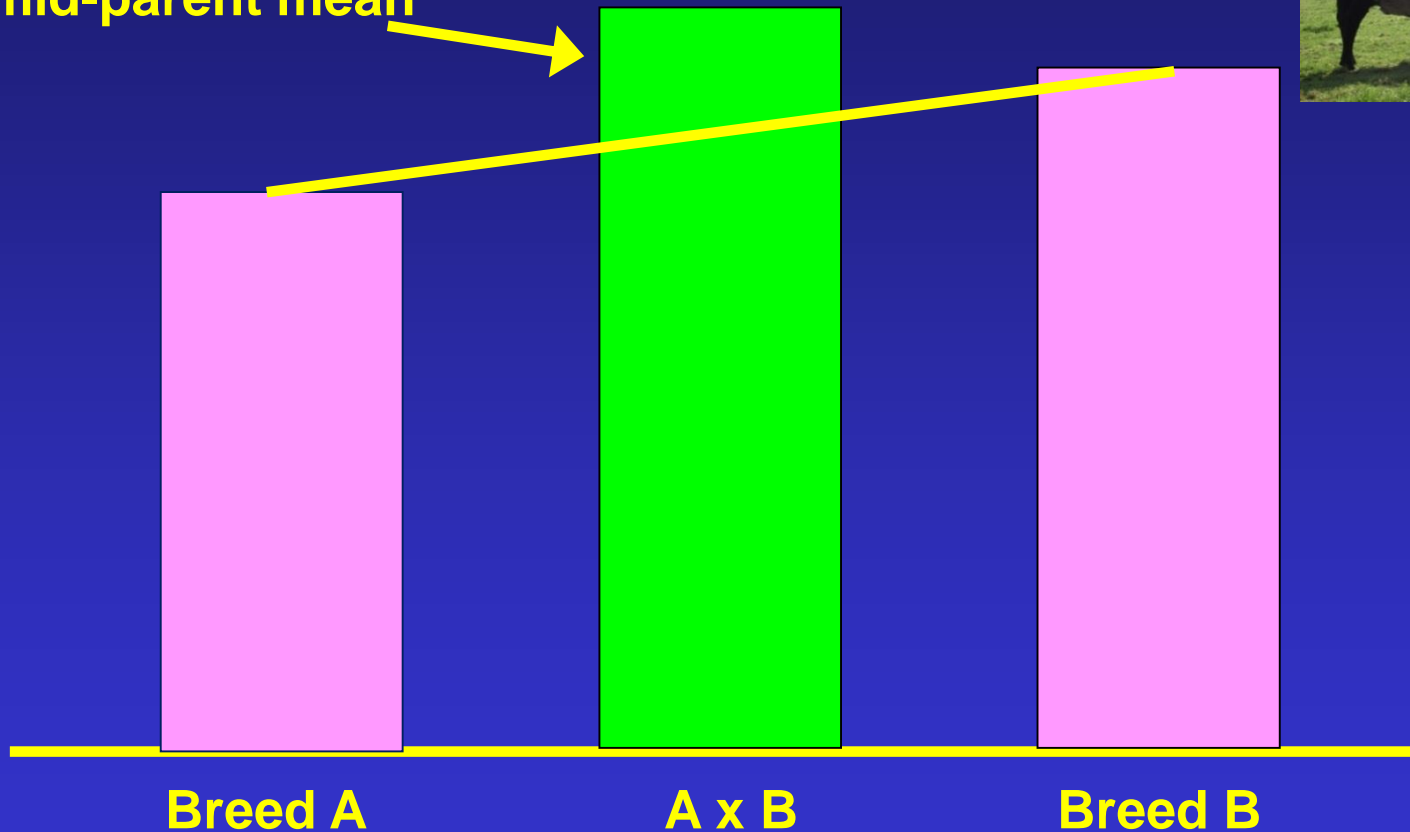
**'Three way crosses'**



**Pure bred**

# Hybrid vigour, the advantage to crossbreds over the average of the parent breeds

**Hybrid vigour = extra performance above mid-parent mean**



**Hybrid vigour improves low heritability traits such as fertility and health**

(adapted from Simm 1998)

# Benefits of a three-way cross breeding programme



## Advantages of having crossbred cows:

- **No. of calves weaned** = **+5%**
- **Wt of calves weaned** = **+5%**

## Advantages of having a crossbred calf:

- **No. of calves weaned** = **+3%**
- **Wt of calves weaned** = **+6%**

## Advantages of superior terminal sire:

- **No. of calves weaned** = **- 4%**
- **Wt of calves weaned** = **+8%**



**TOTAL ADVANTAGE** = **+23%**

# Breed of Cow

- Target replacement rate = 15%?
  - England average = 18.9%
- Qualities required
  - Cross-bred = hybrid vigour
  - Highly fertile = ~95% calves per year (365 day calving interval)
  - Medium sized (550-650kg) and efficient – must get a calf 200 day weight that is 50% of her weight
  - Easy calving – especially required for outdoor calving
  - Good milking ability (~ 2,500+ litres)
  - Hardiness and foraging ability with low maintenance requirement especially for the hills and uplands

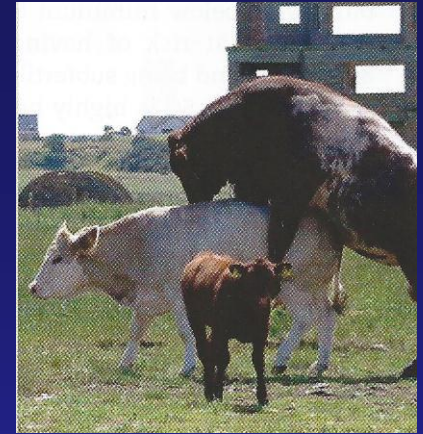




# Breed of Cow

- Cow qualities required

- Longevity
- Sound feet & correct udders and teats
- Reasonable conformation
- Calm temperament
  - Dairy versus beef bred
- Replacements must be available



- If you get cow type right you can use any breed of terminal sire

- Bull: Cow ratio

- 1 Mature bull: 40 cows
- 1 Young bull: 20 cows



# Suckler cow breeds



**Limousin x Holstein-Friesian**



**Angus x Friesian**



**Hereford x Hol-Fr**



**Simmental x Hol-Fr**

# 'Hardy' suckler cow breeds



**Highland**



**Galloway**



**Welsh Black**



**Luings**

# Suckler cow breeds



**Stabiliser**



**Black Baldies**



**Sim-Luing**



**Saler**

# Suckler cow breeds



**British Blue x Hol-Fr**



**Charolais x Hol-Fr**



**South Devon**



**Beef Shorthorn**

# Suckler cow breeds



**Sussex**



**North Devons**



**Blue Grey & Galloway**



**Longhorn**

# Suckler cow breeds



**Lincoln Red**



**Belted Galloway's**



**Pure bred Charolais!**

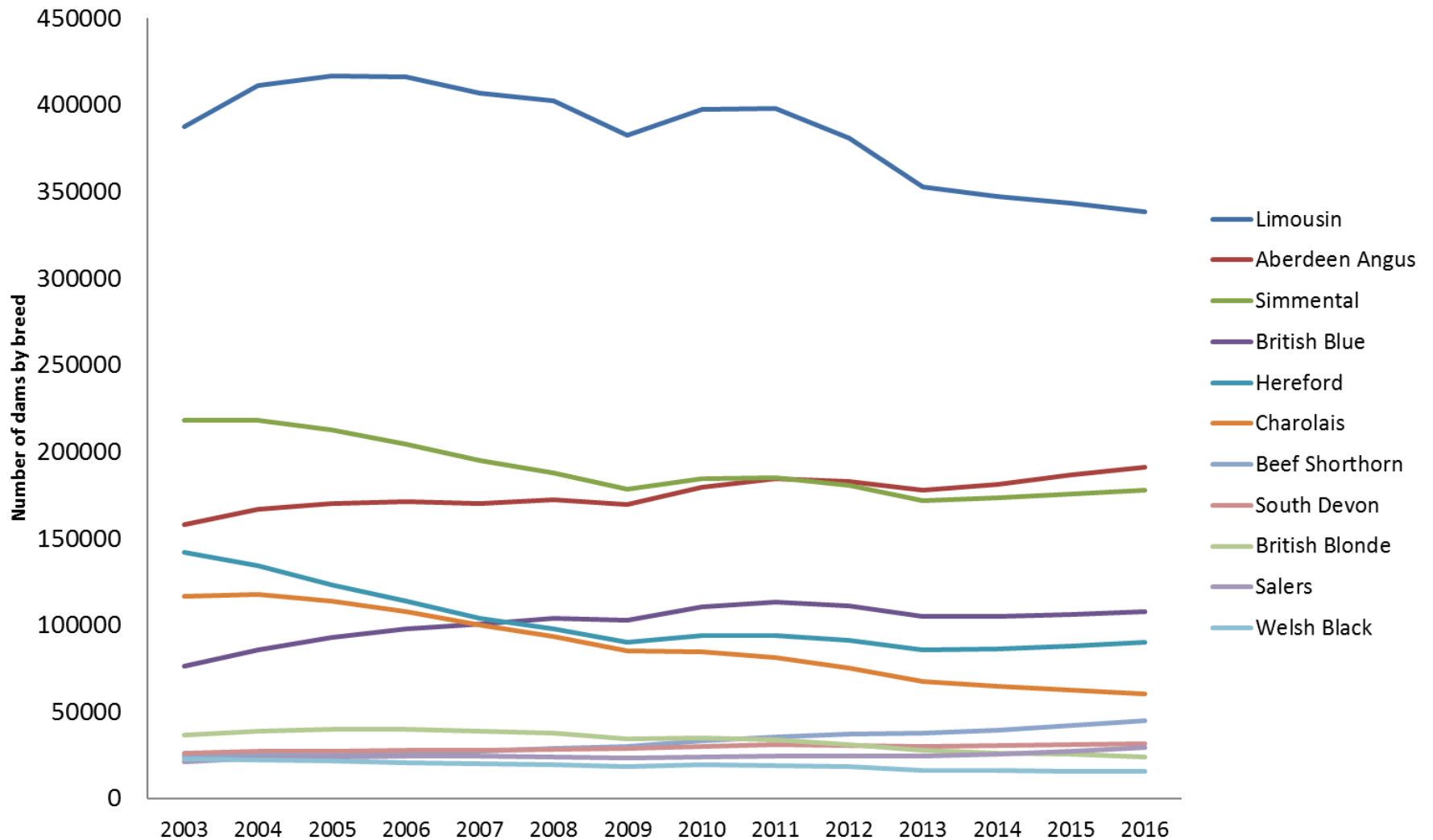


**Pure bred Blues!**

# 1.6m Suckler Cows in the UK...



Figure 4. Number of non-dairy breed dams producing calves each year  
(Breeds with over 15,000 recorded dams per annum)





# Suckler cow replacement policy

- 35% of UK suckler cows are beef x dairy bred. Majority (~80%) are now being replaced by home-bred heifers
- Typical replacement rate is 18.9% (dairy herds = 25.6%)
- Essential that cows are cross-bred and have hybrid vigour. For purchased replacements is the choice of breed available?
- Average age at 1<sup>st</sup> calving = 34 months (EBLEX Beef Briefing 12/03) the target is 24 months!



# Suckler cow replacement policy

- Perceived problems with replacements sourced from the dairy herd due to 'Holstein influence'
  - Poorer fertility
  - Poor conformation
  - Increased feed requirements
  - Increased udder disease
- Many dairy herds now using 'less extreme' Holstein genetics



**Lim x Holstein!**

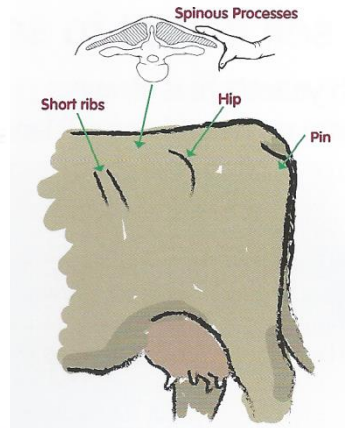
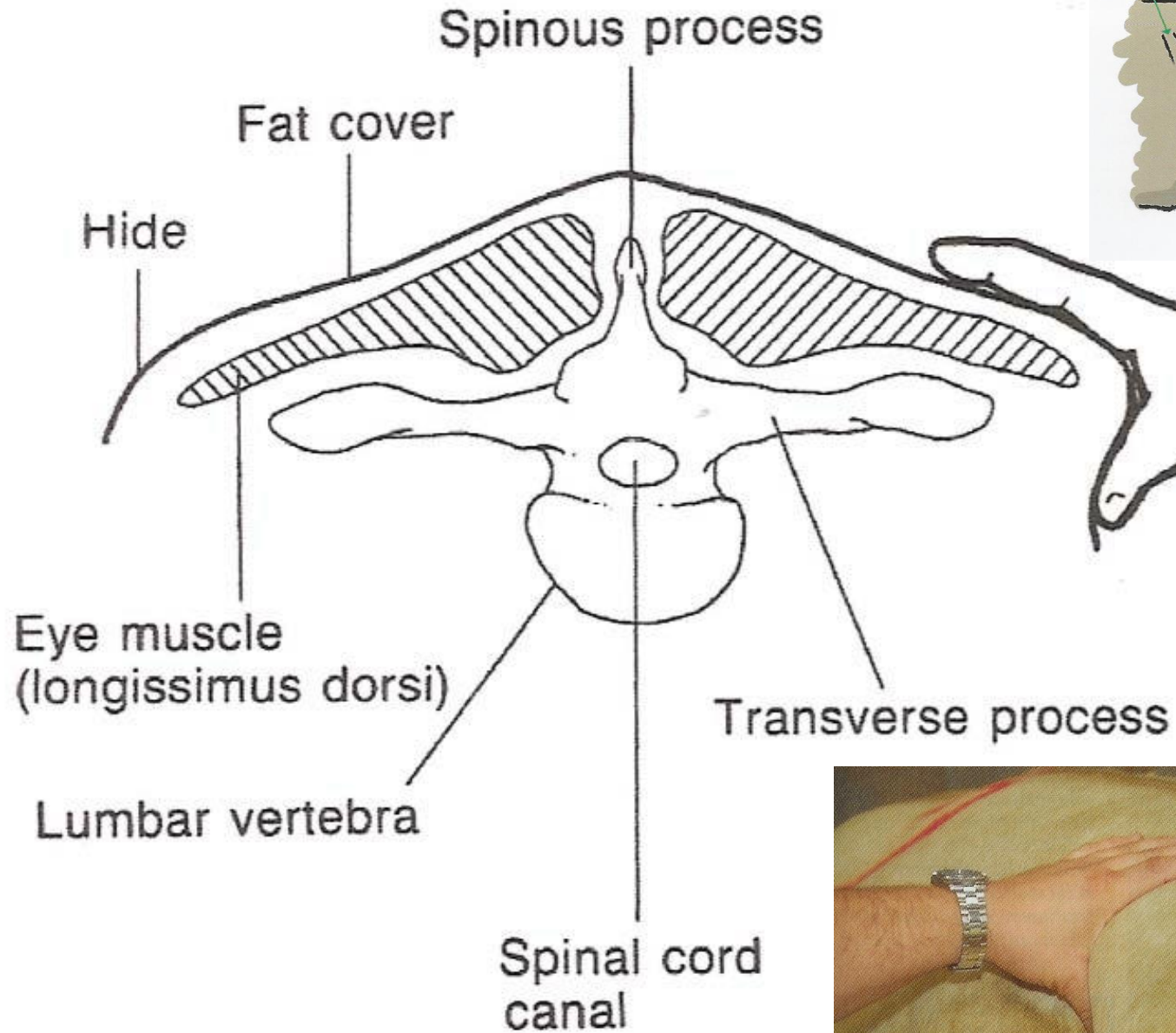


## Body Condition Score (BCS)

- The condition of a cow has a significant effect on the physiology and reproduction of the cow
- The cow will draw on fat reserves during the production cycle
- Condition scoring assess the fitness of the cow
- BCS = amount of fat around the tail head and loin area
- BCS scale of 1 (very thin) – 5 (grossly fat)
- 1 unit loss/gain of BCS = approx 13% of live weight



Below BCS 2 = LEAN, BCS 2-3 = FIT, BCS 3 = GOOD, 4+ = FAT

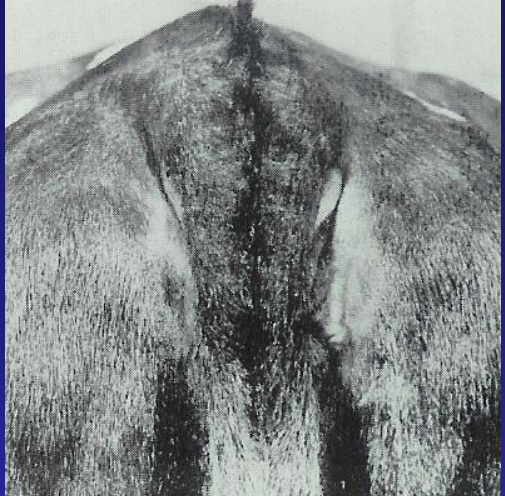




BCS 5 = Grossly Fat



BCS 4 = Fat



BCS 3 = Good

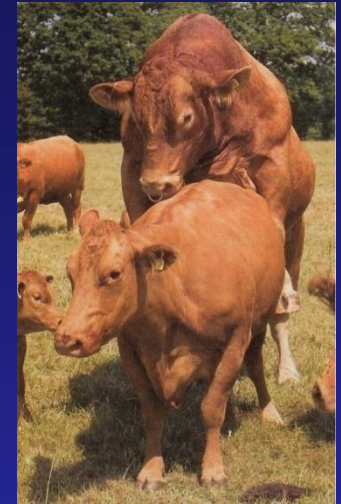


BCS 2 = Moderate/Lean



BCS 1 = Poor

# Importance of BCS



## a) Conception rate

Herd BCS at bulling	Calving interval (days)	Calves weaned per 100 cows to the bull
Below 2	418	78
2-2.5	382	85
2.5-3	364	95
Over 3	358	93

(Allen, 1990)

An increased BCS at the time of mating leads to an increased conception rate and a decreased calving interval. The target BCS at bulling = 2.5+

**b) Calving difficulty: An increased condition score at calving leads to increased calving difficulty**

Effect of BCS on dystocia in Hereford x Fr cows

Condition Score	Assisted Calvings (%)
2.0	6.7
2.5	7.7
3.0	8.0
3.5	10.1
4.0	14.3



Cows with high (3.5+) BCS at calving will have increased calving difficulties

80% of foetal growth occurs in the last 3 months of pregnancy

c) Subsequent calving interval: An improved condition score at calving results in a shorter calving interval

Effect of BCS at calving on calving interval in suckler cows

Condition Score	Calving interval
1-1.5	418 days
2.0	382 days
2.5	364 days

(Drennan & Berry, 2006)



Cows with high (3.5+) BCS at calving will have increased calving difficulties



## d) Economic use of feed:

- A spring calving cow in BCS 2 in the autumn will need to be fed either an extra 1.5kg of concentrates or 6-10kg of silage per day during the winter compared to a cow in BCS 3.
- Target BCS at spring = 2.0-2.5



Example winter rations for a dry Spring calving suckler cow fed *ad-lib* straw

BCS at housing	20% CP concs (kg/day)	Conc feed costs @ £200/t (£/cow/winter)
2	4.5	£162
3	3.0	£108

## e) Target condition scores:

Season	Target CS	Spring calver	Autumn calver
Spring	<b>2.0-2.5</b>	Calving	Pregnant/ lactating
Summer	2.75	Mating/ lactation	Weaning
Autumn	<b>3.0-3.5</b>	Weaning	Calving
Winter	2.75	Pregnant/ dry	Mating/ lactation



# Target Body Condition Scores

Spring

2.0-2.5

LEAN



Summer

2.75

FIT



7-10 cm  
sward ht

Autumn

3.0-3.5

GOOD



# The suckler cow production cycle

## The cow production calendar

Cow management, nutrition and body condition score impact on fertility and performance throughout the year, not just during the breeding season.



### Dry Period/Late Pregnancy

Cows should be at target BCS for calving six weeks before giving birth. Avoid changes to BCS within six weeks of calving.

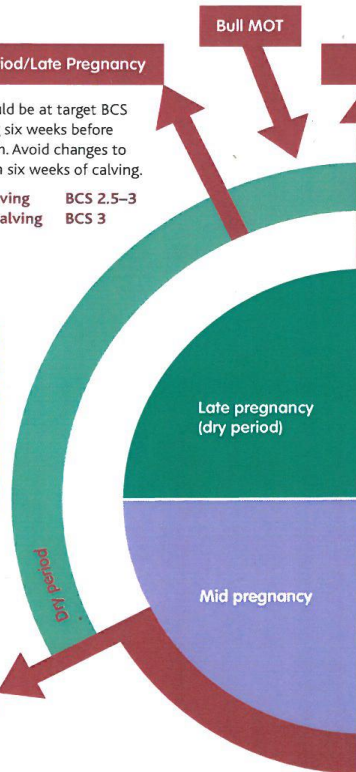
Spring calving BCS 2.5–3  
Autumn calving BCS 3



Wean early if cows/heifers are in poor body condition or if feed supplies are short, eg drought. Increase body condition gradually during this period for spring calvers.

Spring calving BCS 3–3.5  
Autumn calving BCS 2.5

### Mid Pregnancy



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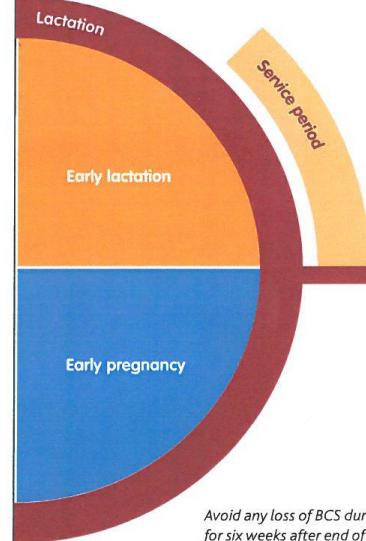
### Calving

Spring calving BCS 2.5  
Autumn calving BCS 3

Service period starts six weeks after calving. Cows need to be back in calf 12 weeks (80 days) after calving.

The average gestation length for commonly used terminal sires is 280–290 days, leaving only 80 days for the uterus to recover after calving, and the cow to start cycling again and become pregnant.

Achieving a 365-day calving interval depends on a cow being in good body condition and fit and healthy after calving.



### Service and Early Pregnancy

Thin cows will struggle to conceive. Aim to increase BCS from calving to six weeks after conception to encourage bulling activity, implantation of the embryo and reduce early losses.

Spring calving BCS 2.5–3  
Autumn calving BCS 3

Avoid any loss of BCS during mating and for six weeks after end of service period.

9



# Timescale for a SPRING calving cow

- a) **Spring – Calving is usually indoors with cows and calves turned out ASAP onto spring grass. Good grass growth leads to high milk yields. Target Condition score = 2.0-2.5**
- b) **Summer – The mating period is usually late May – mid August. Condition scores are improving and there is an increased conception**
- c) **Autumn – The target condition score = 3-3.5. If the condition score is >3 then the winter feed requirement can be reduced**

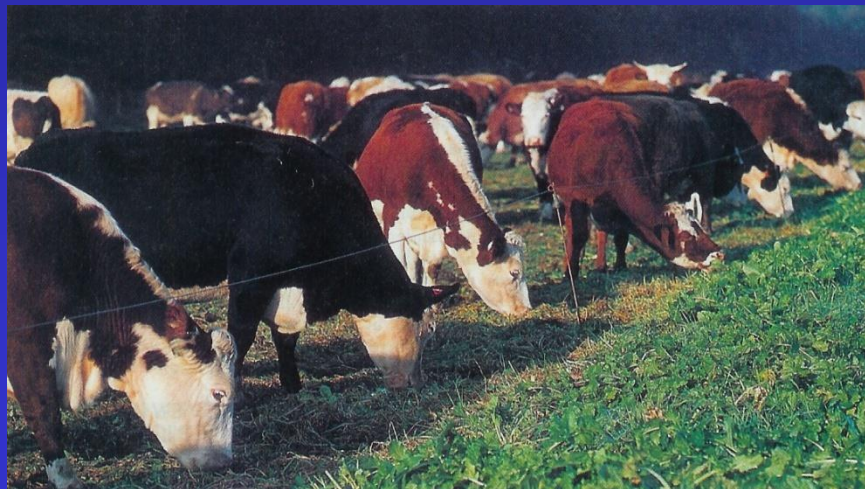
**Calves are weaned at 6-9 months old, ideally 1-2 months after housing**



## Timescale for a SPRING calving cow

- d) Winter – There is a moderate daily feed requirement e.g. restricted silage (approx 30kg @ 25%DM) per day plus *ad lib* straw and minerals OR *ad lib* straw + 3-4kg 20% CP concentrates

Condition score allowed to fall from 3+ to 2.0-2.5



# Timescale for an AUTUMN calving cow

- a) **Autumn – Calving usually takes place outdoors. Condition score = 3. If the condition score is  $>3$  = dystocia, if  $<3$  there is an increased feed requirement over winter**
  
- b) **Winter – There is a high feed requirement e.g. *ad lib* grass silage (approx 45kg @ 25% DM) + 2kg concentrates per day. Calves creep fed up to 2 kg per day. The mating period is between November and February. Condition score allowed to drop after bulling**



# Timescale for an AUTUMN calving cow

- c) **Spring – The cow is turned out onto spring grass leading to increased milk production**

**Target Condition score = 2.5**

- d) **Summer – Calves are weaned at 10 months old. Cows are on restricted grazing whilst calves graze on hay/silage aftermaths**

**Target Condition score = 2.5-3**





# Calving Interval & Compact (block) Calving

- Target Calving Interval = 365 days
  - UK average = 399 days with 88.3 calves per 100 cows i.e. 80.8 calves per calendar year
- Target 9 week compact (block) calving period
  - Benefits of block calving are easier management of feeding cows, weaning calves and reproduction
  - Reducing the calving period from 18 to 9 weeks can increase average calf weaning weight by 47kg
  - Calving periods extending beyond 12 weeks costs £3.55/cow/day



# Problems of a wide (4+ month) calving period

- Inefficient use of labour
  - Calving supervised for 4+ months
  - Small groups of calves for dehorning etc.
- When mating starts a third of the herd will still be pregnant
- Wide range of calf ages increases disease risk
- Early calving cows will be milking 5 months longer than late calvers and will be at a lower BCS



## Problems of a wide (5+ month) calving period

- When fed the same ration early calvers will be underfed and late calvers overfed
- Vaccines will be inefficiently used e.g. when to vaccinate for rotavirus etc..
- High risk of early born heifer calves being served by the bull or bull calves
- Homebred heifers will need to be calved at nearer 3 than 2 years old



## Achieving a Compact (block) Calving period

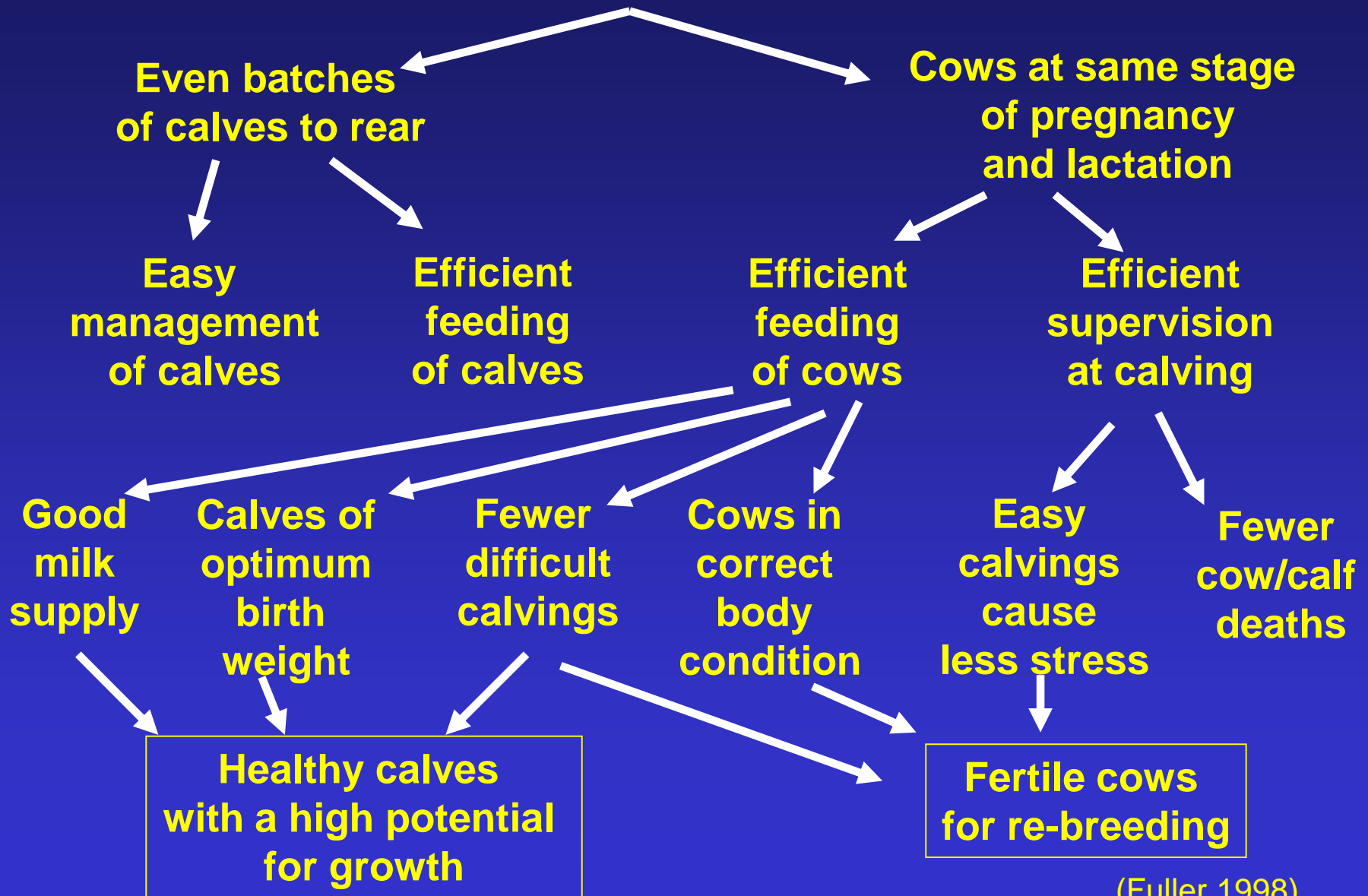
- The cows should be at the correct condition score at mating time i.e. 2.5+
- Ensure the bull is fertile with the correct cow: bull ratio
- To achieve and maintain compact calving the mating period should be no longer than 10 weeks ('bull in - bull out')
- Rotate the bulls between the groups of cows every 3 weeks or test the fertility of the bulls
- Bulls purchased from pedigree sales need a period of adaptation on the farm before working

# Achieving a Compact Calving period

- Heifers should ideally calve 2-4 weeks prior to the start of the calving period
- Barren cows should be culled (late calving cows sold with 'calf at foot'?)
- Have Spring and Autumn calving herds?
- Delay the start of mating
- Use 'controlled breeding techniques' and AI



# Advantages of a compact calving pattern



(Fuller 1998)

# Calving management

- Management of the in-calf cow

- Choice of sire

- Focus on ease of calving

- Use bulls with positive Calving Ease Direct EBV's

- Cows in correct condition score (BCS @ 2-3)

- Focus on nutrition pre-calving



- Management during calving

- Clean, disinfected, well bedded calving area

- Calving difficulties – patience required!

- Dip the calf's navel twice in iodine (at birth and after 24 hours)

- Supervise colostrum intake



# Colostrum

- Provides passive immunity (immunoglobulins [Ig])
- Has a high nutritional value (protein and energy)
- Acts as a laxative (removal of the meconium)
- The composition of colostrum is significantly different from milk

The calf should have 3 litres (7.5% of live weight) of colostrum within 6 hours of birth. This can be obtained with ~20 minutes of 'effective suckling'





# Composition of Colostrum

	Birth	After 24 hours	After 72 hours
Total solids	340	160	140
Protein - casein	55	42	35
Protein - immunoglobulin	170	26	10
Fat	65	46	39
Lactose	21	42	46
Minerals	14	10	10
Vitamin A (iu/kg x 1000)	115	78	7
Vitamin B2 (ppm)	60	35	18

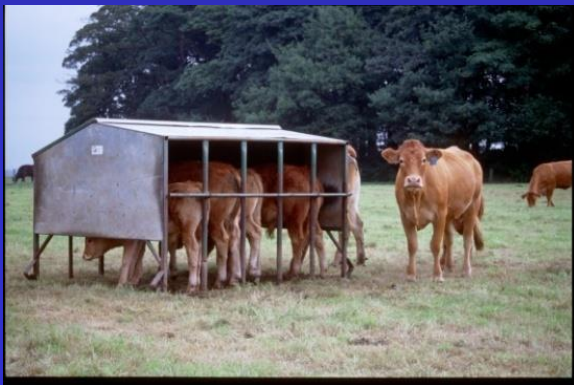


(Leggate 1996)

# Suckled calves



- **Targets:**
  - DLWG to weaning = 1.1-1.4kg
  - Target = calf weighing 50% of the cow live weight at 200 days
  - Introduce creep in mid/late summer with spring calving herds
  - Introduce creep at 4-6 weeks old with autumn herds
- **Creep feeding**
  - Increases calf weaning weights. Typical FCR approx. 2.5-4:1 i.e. 120kg creep = +30 kg liveweight at weaning
  - Helps minimise growth check and mortality at weaning
  - Improves cow condition & calf coat bloom



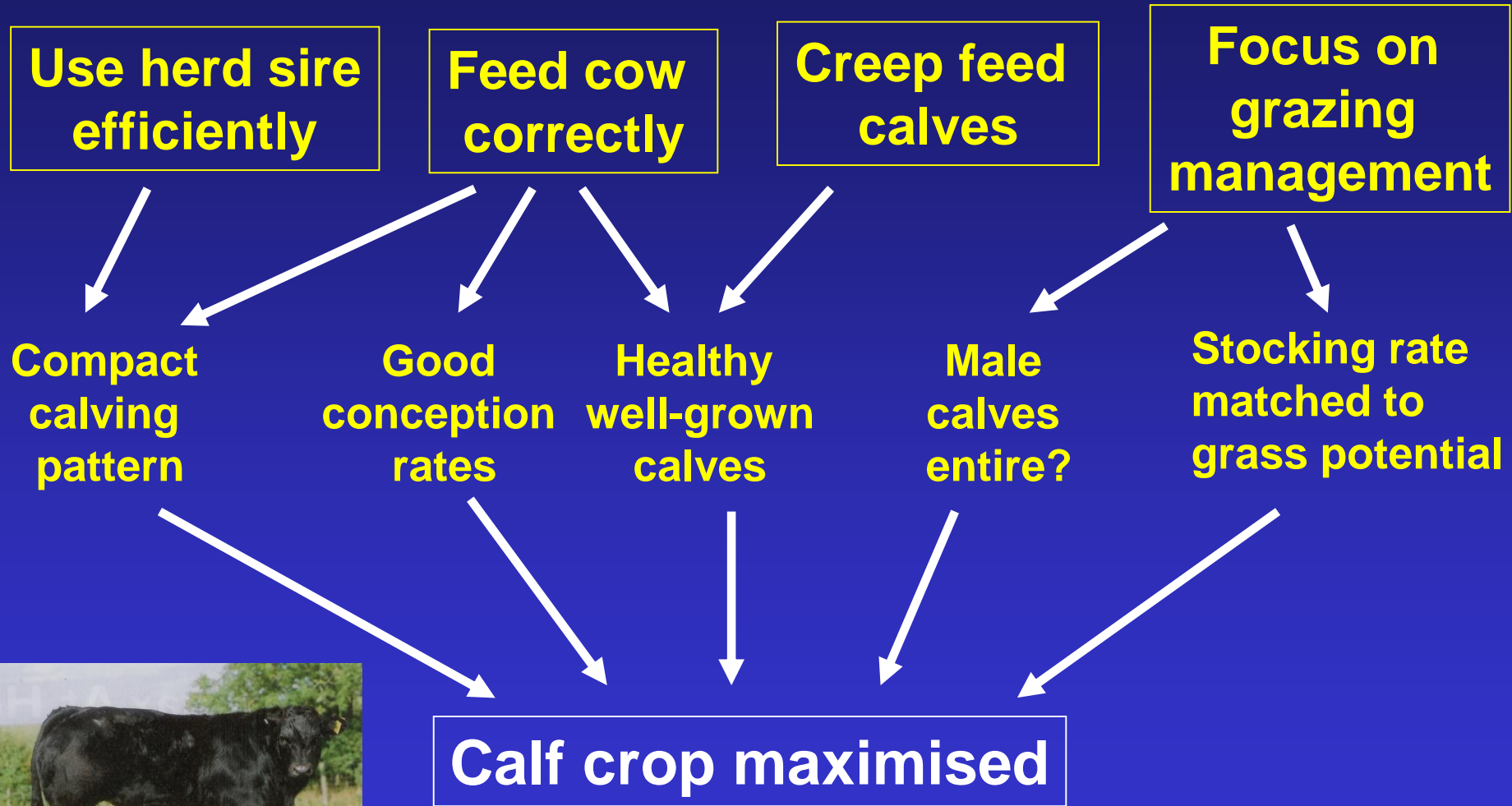
# Creep feeding suckled calves

- It is more efficient to feed creep to the calf than to feed concentrates to the cow
- Wean calves from thin cows earlier than normal
- Creep feeding results in higher feed intakes post weaning

	Typical creep ration
<b>Crude Protein (%)</b>	17-19% in DM (15-17% 'as fed')
<b>ME (MJ/kg DM)</b>	12.5-13.0



# Management practices to maximise the calf crop



(Fuller 1998)

# Suckled calf finishing systems

- Spring born calves
  - Intensive (12-15 months)
  - Semi-intensive (18-20 'off grass')
  - Extensive (24-30)
- Autumn born calves
  - Semi-intensive (18-20 'out of yards')
  - Extensive (24-30)



# Further Information

- Feeding suckler cows and calves for Better Returns. EBLEX Beef BRP Manual 5 (2016)
- Optimising suckler fertility for Better Returns. EBLEX Beef BRP Manual 8
- Out-wintering on forage crops. EBLEX Better Returns Programme (2008)
- The Mini Feeds Directory, EBLEX Better Returns Programme (2008)
- EBLEX Beef Diseases Directory

