Beef Production

Cow

Mating

Gestation
285 days

Calves from beef herds

Calves from dairy herds

Calving

Birth

Birth

Mating with bull or by AI (target to be in calf by 80 days after calving)

Suckling for up to 6 months

Milk replacer for 5 weeks

Weaning

Weaning

Rearing for 3-6 months

Finishing starts

Finishing starts

Slaughter at 14-20 months
450-550Kg

Slaughter at 18-30 months
450-550Kg

Some facts on UK Beef industry!

- 2.2million cattle slaughtered in the UK every year.
- 1.6 million suckler cow's.
- Beef production was worth £2.2billion in 2009.
- Imports came to £740.5million.
- Exports came to £213.2million.
- There are approx 66000 beef farms in UK.

Systems of beef farming

- Single suckling
- Dairy calf to beef
- Summer grazing
- Winter finishing
- Combination of winters and grazing, i.e.
  - Weanlings to stores/finish
  - Stores to stores/finish
- Bull beef

Key performance indicators

- **Liveweight gain (**weight gained by the animal**)**
- **Slaughter age and weight (**when animals are fit to go to the abattoir**)**
- **Carcass weight and kill out % (**animals dead weight**)**
- **Stocking rate (**amount of animals per acre)
- **Replacement rate**

Mandatory Beef Carcass Classification

Under EU Legislation, approved abattoirs slaughtering over a minimum (75 ?) number of cattle per week must provide carcass classification

Classification Criteria

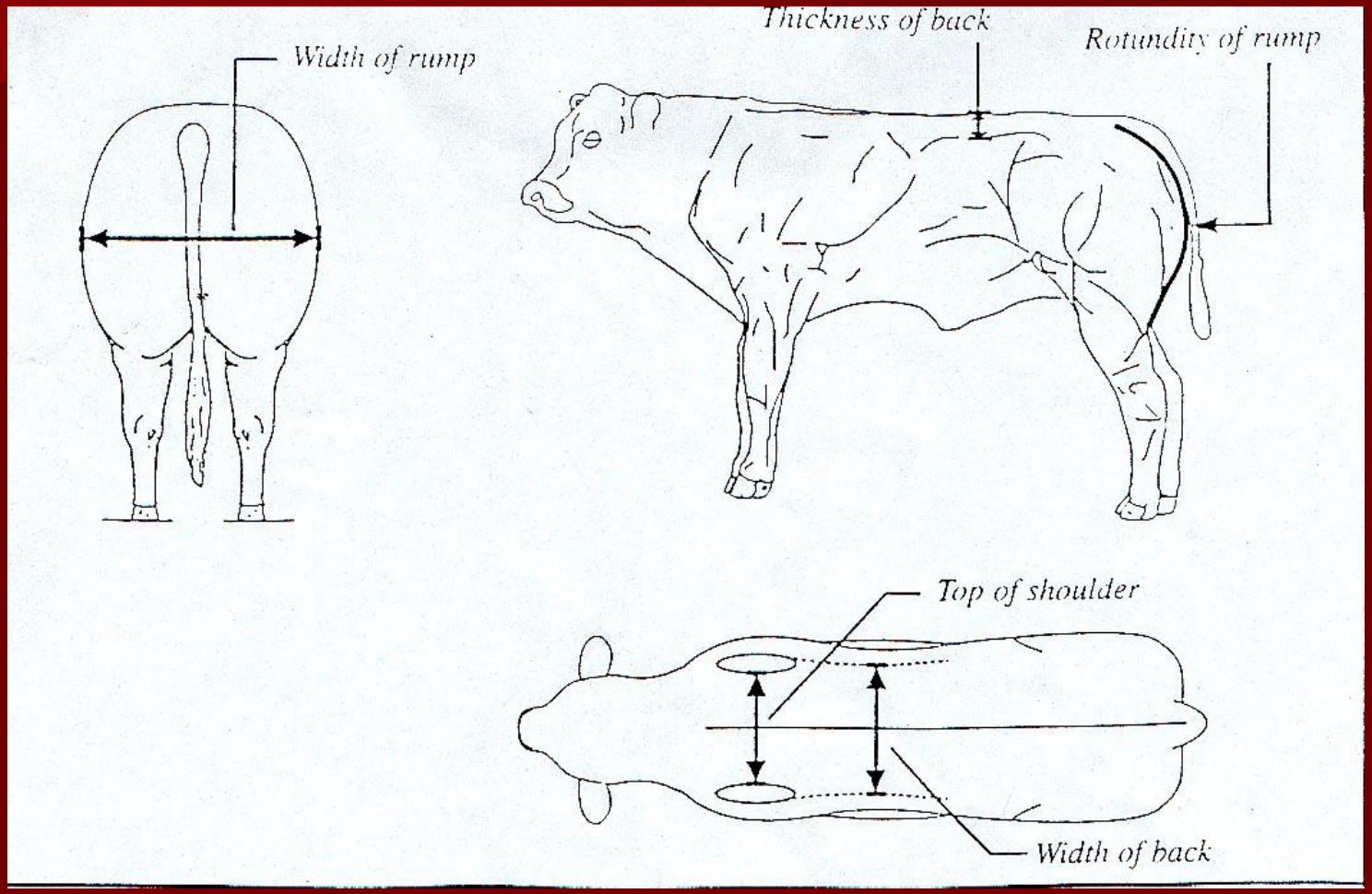
Cold carcass weight ~ hot weight x 0.98 (can vary by country)

Sex ~ steer, heifer, cow, young bull, bull

Conformation ~ 5 classes E,U,R,O,P

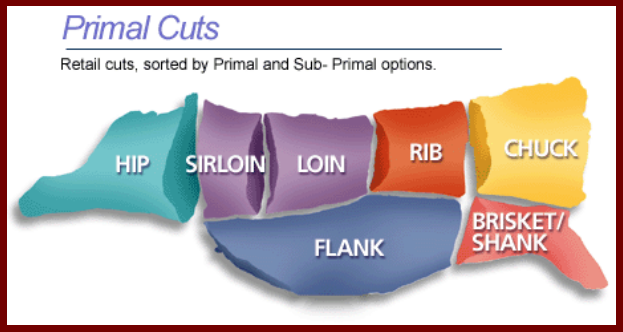
Fatness ~ 5 classes, 1 to 5

MUSCULAR DEVELOPMENT



Conformation Description

Code	Quality	Round, Back, Shoulder
E	(Excellent)	***Round*** : very rounded ***Back*** : Wide and very thick ***Shoulder*** : very rounded
U	(Very good)	***Round*** : Rounded ***Back*** : Wide and thick ***Shoulder*** : Rounded
R	(Good)	***Round*** : Well developed ***Back*** : Less wide at shoulder ***Shoulder*** : Fairly well developed
O	(Fair/medium)	***Round*** : Average to lacking development **Back** : Average thickness, rump straight ***Shoulder*** : Average development to flat
P	(Poor)	***Round*** : Poorly developed ***Back*** : Narrow-bones visible ***Shoulder*** : Flat with bones visible



Fatness Description

Class	Carcass fat cover	
1 **(low)**	None to low	No fat
2 **(Slight)**	Slight, fat most places	
3	Except round and shoulder	**(Average)** everywhere covered with fat muscles still visible
4 **(High)**	More cover than 3.	Distinct fat deposits,
5 **(Very high)**	Entirely covered,	Heavy fat deposits

Example of difference between a U & O

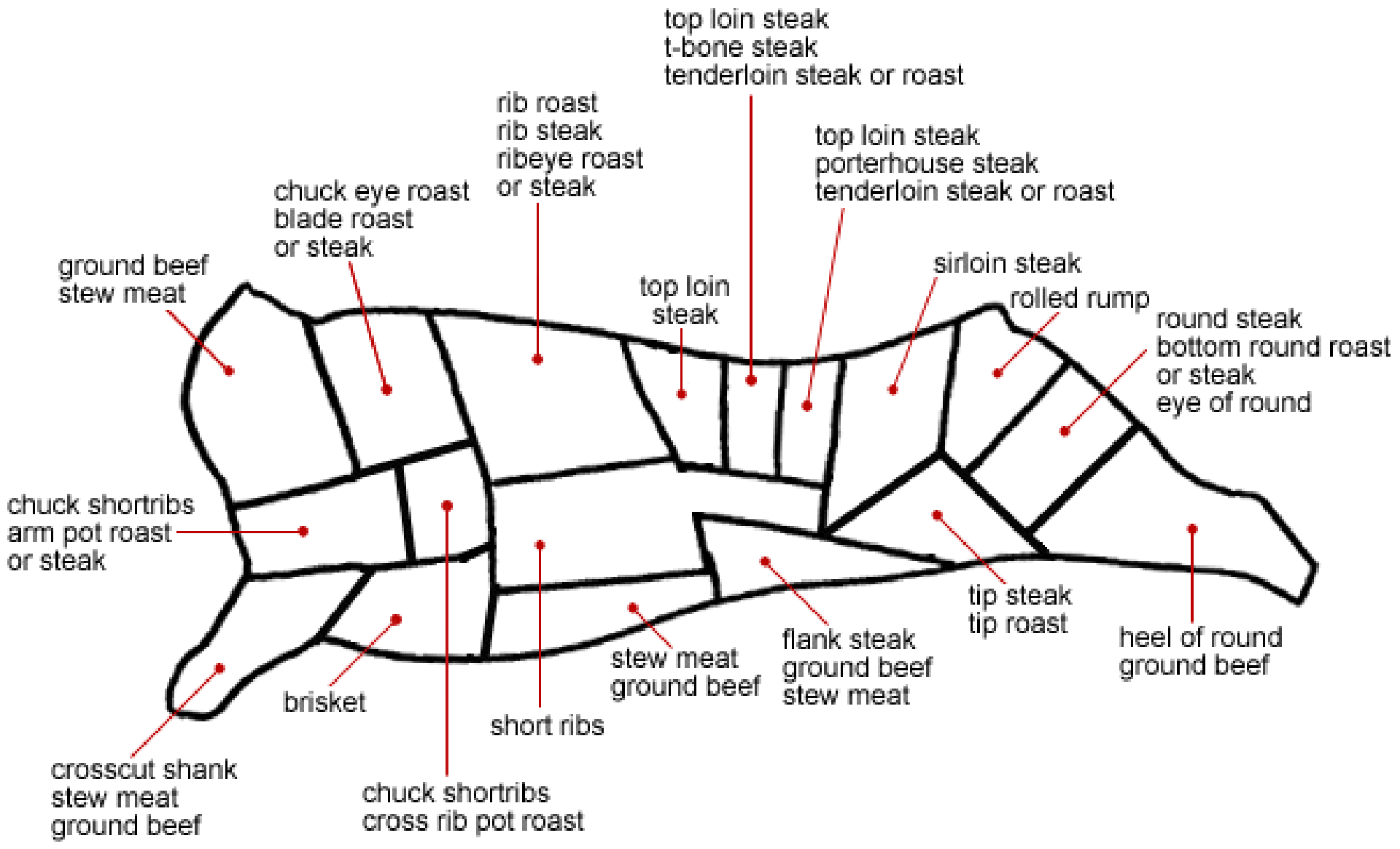
	Carcass Conformation		
	U3	O3	Difference
Carcass wt. (kg)	360	360	
Meat (kg)	270	240	+30
Fat (kg)	30	43	-13
Bone (kg)	60	77	-17
Value (c/kg carcass)	322	285	+37

Price difference (c/kg) between U3 and O3 steer (or bull) caracss

Grange Study	**+37**
Ireland	**+17**
UK	**+23**
France	**+70**
Italy	**+79**
Spain	**+39**

Teagasc, 2006

Beef Cuts


top loin steak
t-bone steak
tenderloin steak or roast
rib roast
rib steak
ribeye roast
or steak
top loin steak
porterhouse steak
tenderloin steak or roast
chuck eye roast
blade roast
or steak
ground beef
stew meat
top loin
steak
sirloin steak
rolled rump
round steak
bottom round roast
or steak
eye of round
chuck shortribs
arm pot roast
or steak
tip steak
tip roast
heel of round
ground beef
stew meat
ground beef
flank steak
ground beef
stew meat
brisket
short ribs
crosscut shank
stew meat
ground beef
chuck shortribs
cross rib pot roast

Breeds for beef production

- **Usually classified into**
  - **Traditional beef breeds – Hereford, Angus**
  - **Continental – Charolais, Limousin, Simmental, Belgian Blue**

Traditional Beef Breeds

Aberdeen Angus - UK

Hereford - UK

- Lower Mature Weights
- Higher degree of carcass fat marbling
- Lower Calving difficulty
- Used on dairy/cows heifers

Charolais - *France*

Limousin - *France*

Simmental - *Austria*

Belgian Blue - *Belgium*

Aberdeen Angus!

- Scottish breed originating from Aberdeenshire and Angus in Scotland.
- They are polled.
- The pure breed is solid black but now also in red.
- They are considered an easy calving breed as a sire selection and so are popular for breeding heifers too.
- They are early maturing breed.
- They are also considered quite temperament.

Hereford

- Hereford have a distinctive white face and red coat. Cross breds will generally always have a white face with a possible different colour coat.
- Famous for their good temperament.
- Considered an easy calving breed and quite common with cross-breeding in the dairy herd.
- An early maturing breed. Carcase weight can be up to 300KG.

Shorthorn

- Shorthorn cattle are red, white, roan in colour.
- Very docile, with high fertility and longevity.
- Originate from Teeswater and Durham cattle found originally in North East England.
- Main quality is for suckler replacements in harsher climates. Very popular in Australia and America still.
- Greenmount College Co. Antrim have a shorthorn cross suckler herd.

Belgium Blue

- A large long bodied animal with a straight back and sloping rump. Hidden hips and very muscular hindquarters, strong legs with a fine bone.
- They have the double muscle gene.
- Pure breeds are usually caesarean section calf births.
- Produce high carcass quality and low fat content meat.
- They can be black, white, blue or a combination of those colours.

Charolais!

- Leading terminal beef sire.
- Noted for fast growth and excellent conformation.
- Usually creamy white colour.
- Favoured for their muscling quality,excellent lions and hindquater carcass.
- A big strong well boned animal.
- Has a high kill out %
- Originates from France.

Simmental!

- Originate from Switzerland.
- Now bred mainly for use as a suckler cow due to its milking ability and fast growing traits.
- Easy to handle.
- Longevity and good growth rates along with good mothering ability and docile nature make the Simmental a superior suckler cow.

Limousine!

- Originate from France.
- Generally the pure breed is a golden red colour.
- Not known for being docile qualities, the breed is known for its hardiness and adaptability to different regions.
- They have a lighter frame than the charolais and so are easier calving.
- There carcass has usually has more of the high price cuts and they are lean animals with high kill out %.

Blonde D'adquantine!

- Generally a wheaten white colour.
- Blondes have deep rounded chests and ribs.
- Blondes are muscular in the forequarter, have broad withers, deep heart girth and a large loin area. The are also a long bodied animal.
- Have the ability to hold large weights without becoming over fat.
- Originate from France.

Saler!

- Another French breed. Southern France.
- Generally horned and dark red in colour and used to difficult climates.
- Not known for the docile nature.
- Make good suckler cow's due to their large frame and pelvis area, so easy calving.
- Ability to hold high weight.
- Hardy breed with good maternal qualities and milk ability
- Known for longevity and wearability.

Aubrac!

- Originate from France.
- Tan in colour.
- Hardy breed, high longevity and easy calving.
- Not a very big animal but produces high quality lean meat.

Parthenais!

- Another French breed.
- Wheat colour body black points on the nose, ears, and tail. Very similar to the Aubrac.
- Know to have the highest meat to bone ratio.
- The breed is double muscled but not excessively.
- Always weigh very well.
- Are considered an easy calving breed due to the light bone structure.
- Kill out of 67% being the highest of all the continental breeds.

Cullard Charolais!

- A <u>doubled</u> muscle charolais with no relation to the Belgium blue.
- Not over popular due to the high calving difficulty and high rate of mortality at calving.

Romagnola

- Originate from Italy.
- Highly muscular animals.
- The top line and hindquarters are where the high beef producing ability is on the breed.
- They have a good length body with a rounded rib cage.
- They are an ivory grey colour with black markings on the body.
- Early maturity is a characteristic of the breed.
- In Italy they are chosen for maternal traits to produce early maturing animals.

South Devon's!

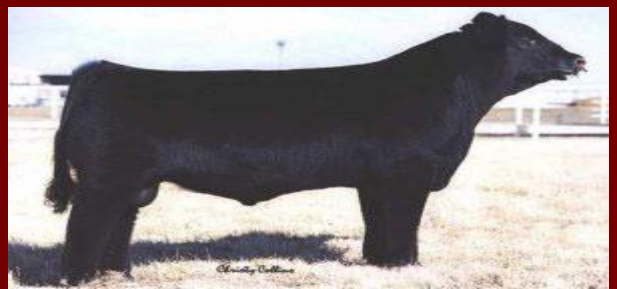
- Originate from South West England.
- Known for its strong maternal beef qualities.
- High marbling quality for beef.
- Highly docile temperament giving easy management.
- Grow quickly and early maturing.
- Hardiness and adaptability.
- Milky dams with good mothering ability.
- Medium red curly coat.

Longhorn

- They can be red, brown, grey and varicoloured. All have a white line down the back and have large wide curved horns.
- Native to north-west and central England.
- Now a rare breed.

Maine Anjou

- Originate from northwestern part of France.
- Large well muscled animals with dark red coat with white markings on the head, belly, rear legs and tail.
- Were known for their easy fattening capability.



BEEF SYSTEMS

Calf to 2 year old steer beef

- Spring born calf – finished @ 2years of age.

Calf purchased	March 08
Weanling	Oct 08
Forward store 1.5yr old	Oct 09
Slaughtered	March 10

First summer at grass.

- First summer at grass:
  - Spring born calf at turnout 90-100kgs (12 week old)
  - Target weight gain 0.8kg/day.

- Achieved by;

I. Grassland management –

May/June	~ 25 calves/ha
July/August	~ 12 calves/ha
September	~ 5 calves/ha
October	~ 2.5 calves/ha

- Leader follower system:
  - Calves graze ahead of older cattle,
  - Calves get best grass,
  - Reduce's parasite problems,
  - Aftergrass is ideal.

II. Concentrate levels:
- Feed 2kg/head/day after turnout 2-4 weeks,
- April/May born calves feed 1-2kg/day in summer,
- Reintroduce conc if grass is scarce.
- Sept → Grass scarce feed 1-2kg/hd/day until housed.

III. Parasite control:

- Hoose/Lungworms,
- Stomachworms → affect from mid June on.
- Clostridial vaccination,
- Blackleg → vaccination 2 weeks pre turnout.

First winter → the weanling.

- Housing: not essential but
  - Prevents poaching,
  - Easy feeding management.

- Veterinary practices:
  - Stomach worms → Ostertagia Type II
    - Picked up at grass,
    - Active during housing,
    - Dose necessary.
  - Liverfluke:
    - Picked up late August onwards,
    - Fluke forecast,
    - Fluke history of farm,
    - Dose accordingly.

- Lice + mange:
  - Carried all year but problem in late winter (housing)
  - Reduced performance (up to 30%)
  - Treat all after housing with sprays, pour-ons, injections.

- Observe cattle frequently → **stress** at housing.

- Performance at housing:
  - Low weight gain in winter = compensatory growth.
  - Compensatory growth = increased growth weight after restricted feeding.
  - Aim is 0.5 – 0.6kg/day (+75-90kg)
  - >0.25kg/day → stunting.

Meals/kg/hd/day	0	2.3	Weight difference
Winter gains (kg)	0.25	0.77	+77
Summer gains	163	108	-55
Winter + summer gains	200	222	+22

Second summer @ grass.

- Yearlings @ turnout = 300kgs.
- Target weight gain @ grass = 0.9kg/day. 1kg/day for continentals.
- Housing mid October = 470-500kgs.
- Cost of grass = 20-25p/kg/LU (livestock unit)
- Maximise the use of grass by monitoring + matching carefully,

  → grass growth,

  →stocking rate.

- Grass Growth:
  - Rotational grazing,
  - Greater control,
  - Measuring grass height as guidelines,
  - Conserve surplus pastures,
  - Topping where necessary to maintain grass quality.

- Stocking rate:
  - Matching stocking rates to grass availability.

Winter finishing → 2nd winter

- Intensive feeding → high rate of weight gain.

- **Housing:**
  - Housed earlier = less poaching but can also mean less performance.
    - Similar animals together,
      - Adequate lying space
        - Avoid lameness
      - Adequate feeding space
      - Access to clean water.

- **Parasite control**:
  - Older cattle more resistant.
  - Watch for stomach worms and hoose.
  - Liverfluke may be a problem,
  - Stomachworms type II ostertagia,
  - Liverfluke → fluke forecast.
  - Mange + lice → treat at housing.

- High performance is essential:
  - Target daily gain = 0.9 – 1.0kg/day
  - Finished weight 650kgs+

- Silage quality:
  - Quality important → aim for 70 – 76% DMD.
  - High weight gain,
  - Reduced costs,
  - A finishing bullock will eat 1tonne per month of silage.

- Concentrate feeding: → consider
  - Cost,
  - Silage quality,
  - Animal type and breed,
  - Sale price,
  - Silage quality.

- Silage analysis important:
  - Silage quality determines level of concentrates.
  - Excellent response to low conc level.
  - As conc level ↑ response ↓
- Recommended:
  - 0.75kg meal/day/100kg live weight + good quality silage.
  - Higher growth potential animal's need higher feed level. Lean meat Vs fat, Limousine Vs Angus.
  - Continental animals can be fed 1kg meal/100kg liveweight on 70%DMD.

Type of ration!

- Energy : 11.5ME/MJ/kg/Dm + (1.1 UFL/kg DM).
- Protein: 12-14% crude protein.
- Mins/Vits: 25kg/tonne of pre-mix

Energy level critical for L.W.G (live weight gain)

Protein content not critical but receive a good response with:

  - Bulls
  - Where silage quality is poor
  - Compensatory growth.

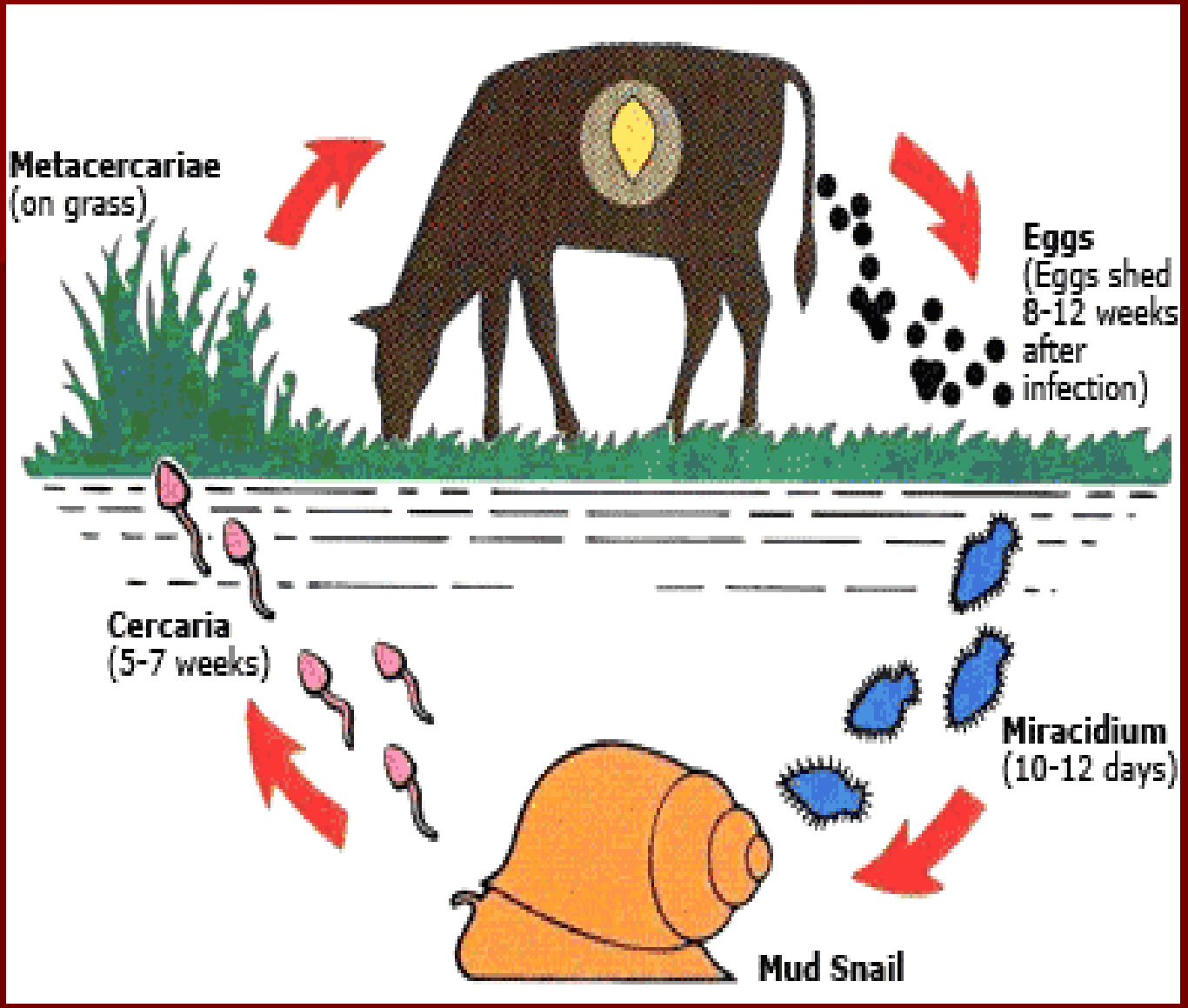
Effects of silage DMD on L.W.G with 500kg cattle.

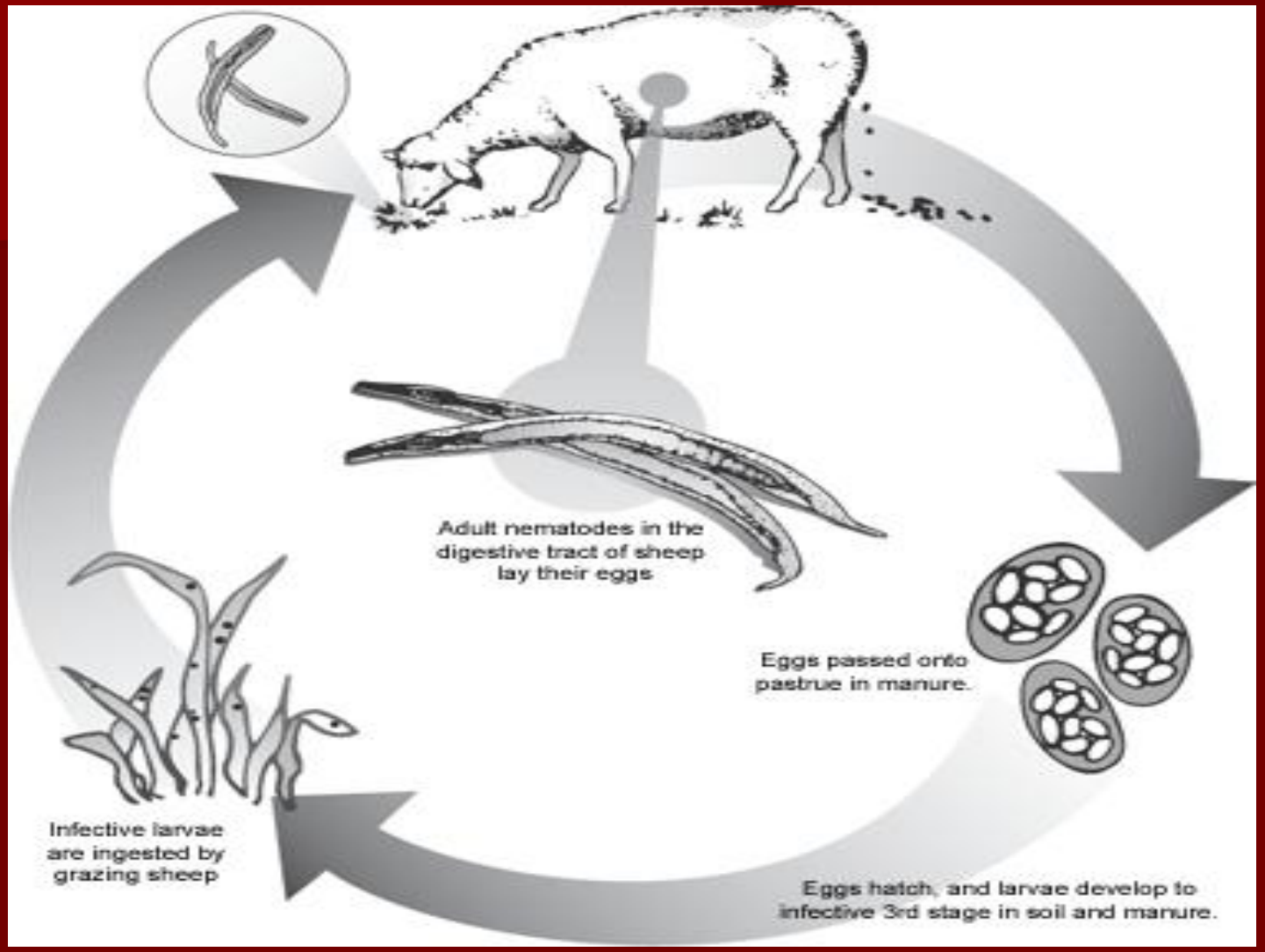
Silage DMD%	Expected L.W.G (kg/day)
72	0.73
68	0.55
65	0.45
62	0.35

Optimum feeding level → finishing stores (550kg)

Silage Quality % DMD	Meals required (kg/day)
75	2.5
70	4.0
65	5.5

Increase conc level by 1.25 → 1.5kg for every 5 unit drop in DMD silage.


Metacercariae
(on grass)
Eggs
(Eggs shed
8-12 weeks
after
infection)
Cercaria
(5-7 weeks)
Miracidium
(10-12 days)
Mud Snail


Adult nematodes in the digestive tract of sheep lay their eggs
Eggs passed onto pastrue in manure.
Eggs hatch, and larvae develop to infective 3rd stage in soil and manure.
Infective larvae are ingested by grazing sheep

Heifers

- A heifer is a female cow that hasn't had a calf.
- There are various different markets for heifers:
  - Suckler Herd Replacements,
  - Local Butcher,
  - Export Trade.
- Approx 180 thousand heifers slaughtered per year.
- Heifers are a lower price than steers(Bullocks)
- Heifers have a 10% lower growth rate than steers(Bullocks).
- heifers mature at lower weights than steers.
- Heifers have a lower kill out % than steers.

- Suckler replacements:
  - Heifers can be selected for suckler replacements for the suckler herd.
  - They usually have good maternal traits.
  - They are usually have a good wide pelvic area.
  - They are not the over fat heifers in the herd.

- Butcher heifers:
  - These are usually the traditional heifers(hereford, Angus)
  - These heifers are usually slaughtered off grass in their second season at grass approx 19months at 500kg liveweight.

- Export heifers:
  - These are usually your big framed continental heifers (Charolais, Simmental, Belgium Blue etc)
  - These heifers are bigger and don't mature until later.
  - They have more of the top quality meat cuts,
  - They are usually 22 months + before slaughter at 600kg liveweight.
  - They have the ability to but on meat over fat.

Steers/Bullocks:

- A steer/bullock is a castrated male. It can not produce sperm and so cannot produce calves.
- Approx 240 thousand steers slaughtered in the UK every year.
- Male calves can only be castrated without an anaesthetic if the are younger than 2 months of age. If over the need an anaesthetic by a vet.