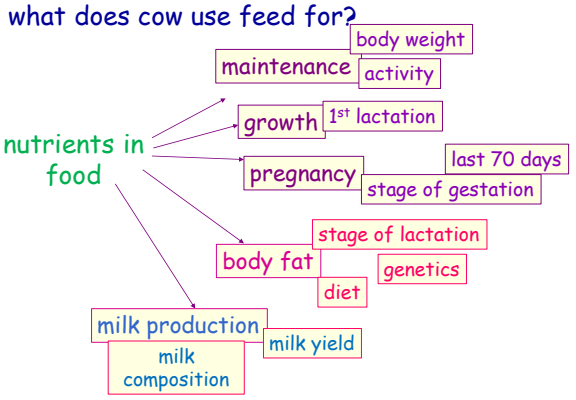
# Feeds and feeding dairy cows

## Animal Production Systems

## what does cow use feed for?




## energy & protein

energy - metabolisable energy (ME)

megajoules (MJ) per kg feed dry matter (DM)

protein - crude protein (CP)

% or grammes per kg feed dry matter (DM)

energy is first limiting nutrient

## energy required at different stages of production cycle

Holstein

maintenance – 750 kg body weight
ME - 65 MJ/day

milk – 45 kg per day
fat – 3.93%
protein - 3.20%
lactose – 4.76%

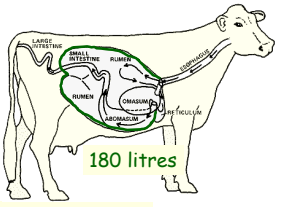
milking cow
290 MJ/day

ME – 225 MJ/day

dry cow
109 MJ/day

pregnancy – end of gestation
ME - 44 MJ/day

## who is being fed?



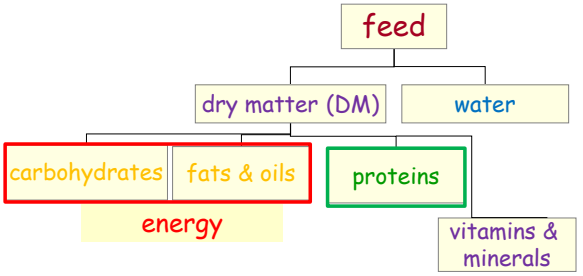

180 litres

- the cow
  ruminant
- the rumen
  - rumen microbes different types
  - plant cell wall digestion
  - microbial protein to small intestine
  - gradual changes to diet

## dairy cow feeds

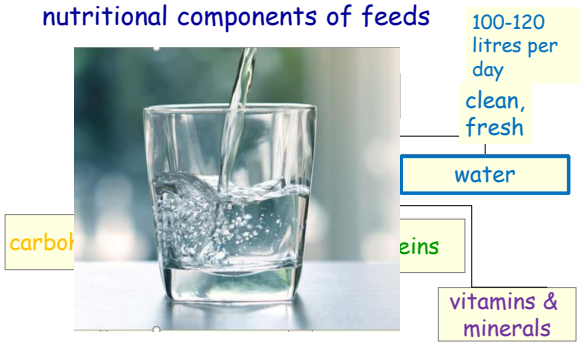
grass
silages
concentrate feeds
straight feeds
by-product feeds
co-product feeds

## nutritional components of feeds



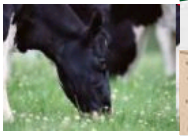

feed value of diets calculated on dry matter basis

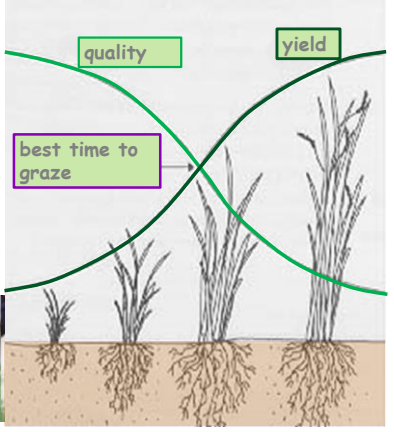
## nutritional components of feeds




## grass

- low cost
- variable quality & quantity
- supports 20 to 25 kg milk





## grazing systems

strip grazed

spring turnout

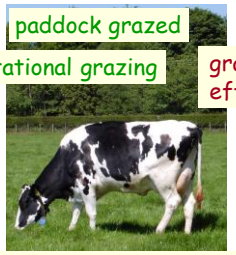
reduce wastage

- area of fresh grass daily (2X)
- enough to meet requirement of group

## grazing systems

paddock grazed

rotational grazing



grass used efficiently

rising plate meter

measures grass cover

pre-grazing target 2500 to 3000 kg DM/ha

residual grass cover 1500kg DM/ha

access to whole paddock

fencing

water

tracks

continuous grazing

set stocking

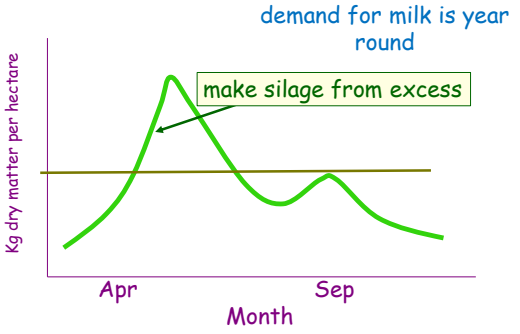
low cost

reduce poaching

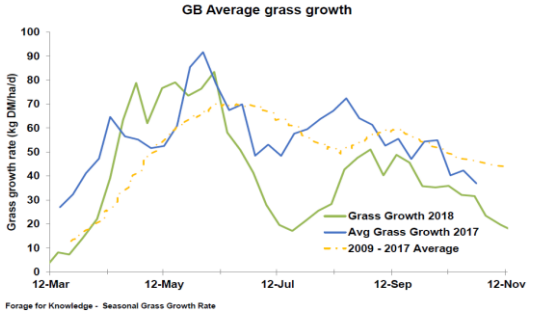
selective grazing

- graze across whole area
  - more difficult to control
    - amount of grass
    - grass quality

## grass production profile




## Grass growth




Source: AHDB's Forage for Knowledge

## conserve forage

- even out supply of herbage
  - silage
    - fermentation
  - hay
    - dehydration

objectives:

- adequate nutritional value
- stable product
- minimal losses

## winter feeds / zero grazing

- conserved forage
  - grass silage
  - maize silage
  - whole crop wheat silage
  - lucerne silage
- straights
- by-products/ co-products
  - cracked wheat, crimped maize — energy
  - soyabean meal, rapeseed meal — protein
  - sugar beet pulp, citrus pulp — fibre
- concentrate pellet

## total mixed ration (complete diet)

- uniform mix — forage, concentrate
- rumen bugs
- continuous rumen fermentation
- dry matter intake up to 30% higher
- increased expense

## forage plus concentrates

- forage offered ad libitum
- amount of concentrates fed:
  - to yield
  - flat rate

or

  - step fed

- in parlour

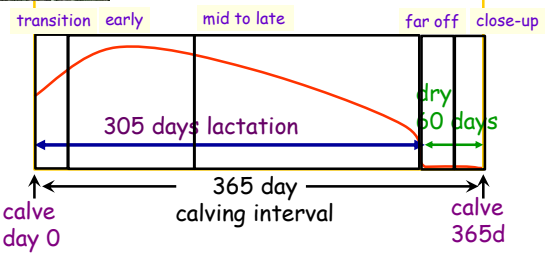
or

- out of parlour feed stations

## selecting a feeding system

- depends on:-
  - level of milk production
  - home produced feeds available
    - amount
    - quality
  - storage and feeding facilities
  - machinery
  - personal choice

## the cow's year




far off close-up

### dry cow

- not milking
- pregnant
- low energy demand
  - calf growing

low calcium diet

milk fever
calcium deficiency
usually post calving

intake: 12-15kg DM/d

aims of ration:

- fill the rumen
  - bulky feeds

straw

ME: 9-10 MJ/kg DM
CP: 12% DM

- maintain body condition

## early lactation

intake: 20-25kg DM/d

ME: 11–12 MJ/kg DM
CP: 16 % DM

- fresh calved
- increasing milk yield
  - increase energy content of the diet
    - increase concentrate content

aims of ration:

- encourage feed intake

acidosis — sub-acute rumenal acidosis (SARA)
too much concentrates

ketosis
insufficient energy in diet

## mid – late lactation diet

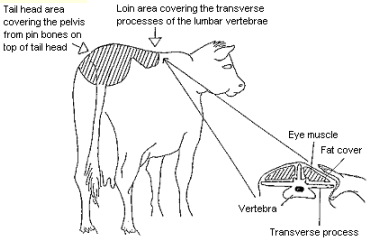
- milk yield falling
- decrease concentrate content of diet
- autumn calving cow -
  - grass alone
  - supplement if grass in short supply

aims of ration:

- support milk production
- manipulate BCS

## body condition score (BCS)

target BCS
calving – 2.5 to 3
peak lactation – 2 to 3
drying off – 2.5 to 3



## summary

- what is in a feed?
- nutrient requirements
- types of feeds
- feed presentation
- feed requirements at different stages of production
- assessing whether the diet is right for the cow