

# Broodmare & Foal Nutrition

Feeding for sound development  
and growth

Catherine Rudenko BSc Equine Science



# Nutritional stages for the mare

- Conception
- Early pregnancy
- Late pregnancy
- Lactation

# It's only natural....

- **January / February** - mare is anovulatory
- **January / February** - soil temperatures low, short daylight hours mean little grass growth

# It's only natural...

- **March / April** - spring grass develops
- **March / April** - transition period

# It's only natural

- **May** - longer daylight hours and mild climate mean higher nutrient content of grass
- **May** - natural breeding season starts

# It's only natural..

- **September** - natural breeding season ends
- **September** - grass growth starts to slow down for autumn / winter period

# Getting the mare ready

- Nature provides an increasing level of nutrition
- This level remains high ( May-Sept ) which covers the first 90 days of pregnancy

# Not so natural ?

- If breeding outside of the natural season you will need to provide extra nutrition
- Steady increase in nutrition 'tricks' the mare into believing it is viable to hold a pregnancy

# Not so natural ?

- Consider the costs of breeding and foaling early in the year !

# Getting the mare ready

- Grass covers the proteins and sugars needed
- You need to provide the essential vitamins and minerals



# What's with the vits and mins ?

- For a wild horse there is enough in the grass
- Wild horses are not under the same pressure as race horses etc



# Building blocks

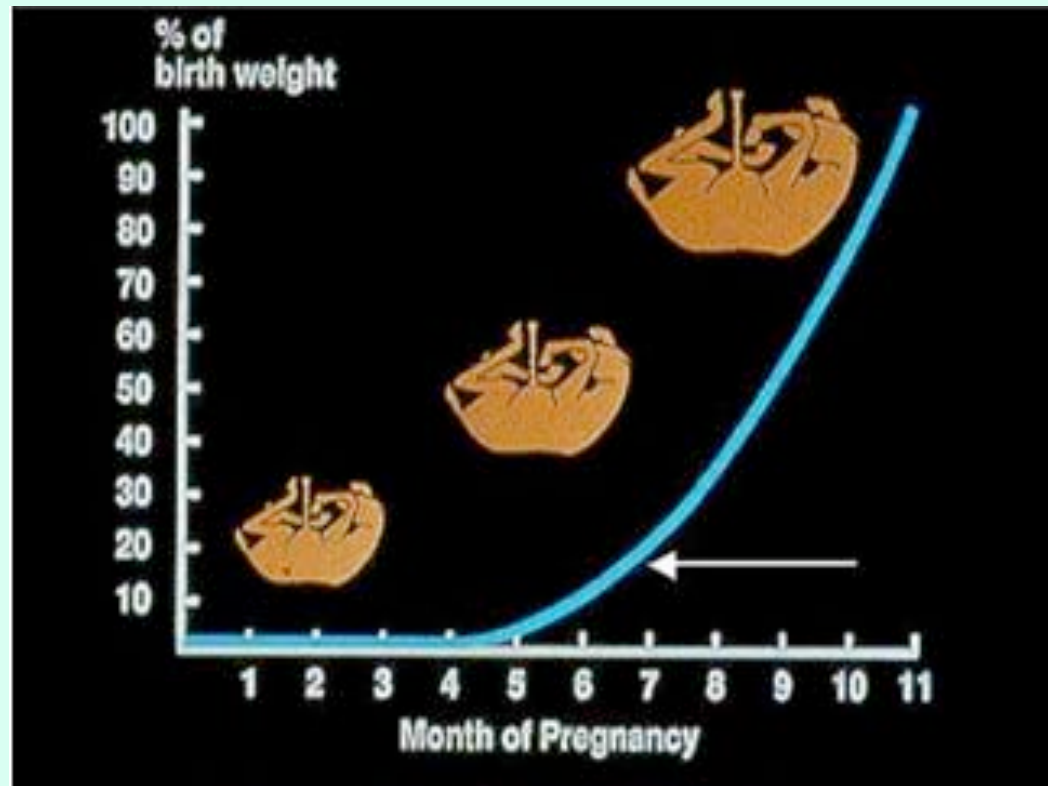
- Vitamins and minerals are the building blocks for the skeleton and tissues
- Essential for making a structure that will withstand repeated pressure over many years



# How much nutrition is needed ?

- Conception to 6 months requirements increase 10 %
- Not eating for two just yet !

# Foetal Growth



# Late pregnancy

- Foetus grows rapidly
- Increase in muscle mass and body fat

# Late pregnancy

- Increased rate of nutrient transfer across the placenta
- Uterine blood flow increases from 16,000 ml/min in mid gestation to 32,000 ml/min

# Late pregnancy

- The final 2-3 days before birth contain some important finishing touches to the foals including,

# Late pregnancy

- Maturation of the respiratory, musculoskeletal and nervous systems

# Late pregnancy

- Development of intestinal enzymes

# Feeding the mare late pregnancy

- Elements of the diet are
- Protein
- Sugars ( energy )
- Vitamins
- Minerals

# Vitamins and Minerals

- Small but hugely important
- The mare is reliant on you providing these nutrients
- Especially if grazing is poor or restricted

# Why balance the diet ?

- Vitamin and mineral deficiencies can cause developmental bone disorders and restrict growth rates



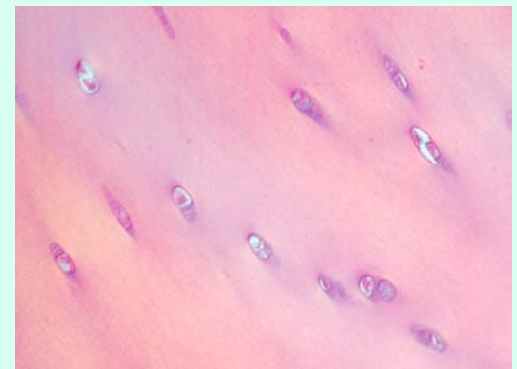
# Vitamin A

- Need for Osteoclasts to function efficiently
- Osteoclasts are ‘bone making cells’
- Lack of Vitamin A = growth retardation in the first 12 months



# Zinc

- Part of the alkaline phosphatase action
- The enzyme that helps calcify (harden) the cartilage in your foals joints



# Manganese

- Part of Chondroitin 4 sulphate and Chondroitin 6 sulphate
- Chondroitin is a major component of cartilage

# Iodine

- Involved with thyroid function and production of T4 (thyroxine).
- T4 regulates metabolic growth rates.

# Copper

- Needed for lysol-oxidase function
- The enzyme that provides 'cross links' in the bone structure

# Dietary options

- 1. Traditional grain based feed
- 2. Vitamin /mineral balancer pellets



# Dietary options 600kg mare

- Traditional stud cubes at 3kg per day & forage
- Vitamin/mineral balancer pellets at 600 grams per day & forage

# Feeding in the 11th month

- Mares appetite will naturally decrease by up to 20%
- Feed a quality nutrient dense diet

# Feeding in the 11th month

- Keep meal sizes small coming up to foaling
- Foaling is as demanding as heavy exercise
- Increased risk of colic with large meals

# Lactation

- Nutritionally this is the most demanding time for the mare
- The mares body condition and nutritional status impact on milk quality and foal development

# Body condition

- Overweight mares have higher fat levels in the milk
- Underweight mares have lower protein and lower fat levels
- Well conditioned mares produce the highest protein levels

# Colostrum

- “First milk” 1.5 -2.0 liters
- Contains immunoglobulins which are needed for the foals immune system



# First 3 months

- Initial 3 months the mares milk is the key supply of nutrients for the foal

# First few weeks

- Foal needs to drink 20-30% of it's BW in milk a day to gain weight
- 2 week old TB filly weighing 77 kgs would drink 15 - 23 litres
- Foal suckles 4-6 times an hour

# Feeding the lactating mare

- Energy requirements increase by 50%
- 600kg lactating mare requires 168 MJDE
- 600kg racehorse requires between 141 - 182 MJDE

# Nutritional Values TB milk

Month of Lactation	Milk Production (kg/day)	DE (MJ/day)	D Protein (g/day)	Calcium (g/day)	Phosphorus (g/day)
0-1	13.8	30 (34)	375 (450)	17.4 (18)	5.9 (14)
1-2	14.6	30.4 (43.5)	330 (500)	14.7 (18)	4.4 (15)
2-3	16.8	33.1 (53.3)	319 (546)	13.5 (17)	4.5 (15)
3-4	15.1	28.4 (59)	292 (535)	10.0 (17)	3.5 (15)
4-5	10.9	20.5 (64)	196 (522)	6.5 (16)	2.2 (15)
5-6	7.5	15.7 (68.3)	135 (510)	4.5 (16)	1.5 (15)

# Feeding the lactating mare

- Good grazing will meet *most* of this need if foaling in the natural breeding season

# Feeding the lactating mare

- If foaling early extra energy (calories) will need to be fed in the form of grains
- If the mares body condition is light or poor grains will be needed to boost energy intake

# Feeding the lactating mare

- Vitamin and mineral requirements increase by 25% above late pregnancy requirements

# Feeding the lactating mare

- You are what you eat !
- The foal is what it drinks !  
( and nibbles )



# Growth plates

<b>Growth Plate</b>	<b>Age at Closure</b>	<b>Rapid Growth Period</b>
Distal Tibia (above hock)	8-24 months	0-6 months
Distal Radius (above knee)	24-30 months	0-8 months
Distal Third Metacarpal (bottom of cannon)	9-12 months	0-3 months
Proximal Proximal Phalanx (top of long pastern)	6 months	
Proximal Middle Phalanx (top of short pastern)	3-6 months	

# Feeding the lactating mare

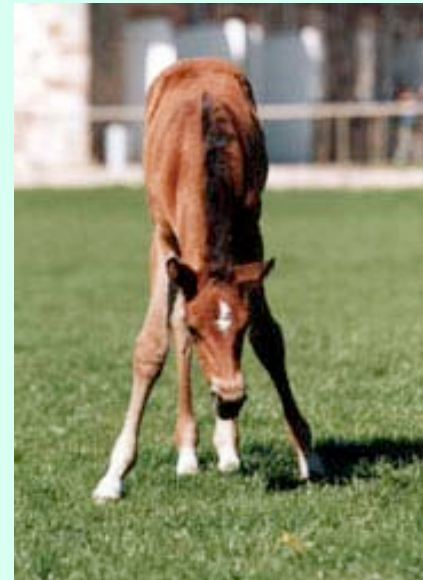
- Use grain based feeds if the pasture can not meet the protein and energy demands of the mare
- Use a vitamin and mineral balancer pellet to top up the pasture / top up a diet where only small grain based feeds are used

# Creep feeding the foal

- Helps avoid stress at time of weaning
- Supplements milk as quality naturally declines after the first two months
- Helps ensure a steady growth curve

# Creep feeding the foal

- Can be fed from 2 weeks of age on a milk based feed
- From 10 weeks old can start on normal foal pellets



# Creep feeding the foal

- Little and often is essential for foal health
- Think tea cups not feed scoops !

# What diet is best for foals to yearling ?

- The diet you choose should be related to how quickly you want to grow your foal
- Growth is linked to the energy fed

# Don't go too fast !

- Over feeding energy can result in sudden weight gain
- The skeleton can't react to sudden increases in pressure due to sudden weight gain

# The result ?

- Bone problems...
- Overloaded joints can swell / grow unevenly leading to ALD
- Bones aren't just in the legs ! The spine can be effected too.

# Protein

- Traditionally blamed for DOD, temperament and just about everything !
- Why ?

# Protein for grading

- Protein content would have typically been associated with how good or bad a grain or forage was
- Generally a higher protein grain / forage would have a higher energy content

# Energy is the culprit

- Excess energy is the real culprit as this affects growth rates
- Kentucky study found that overfeeding protein does not result in DOD's
- Whereas overload on energy intake and you run a very high risk of DOD's

# Protein Example

- Feed companies now have the technology and ingredients to control protein and energy levels ( vs traditional straight grains )
- 14% Racehorse Cubes have 30% starch
- 14% Horse Care Cubes have 16% starch

# Protein is about numbers..

- 14% stud cubes is 140 grams of protein per 1kg fed
- 12% competition cubes are 120 grams of protein per 1kg fed
- 10% cool feed cubes are 100 grams of protein per 1 kg fed

# Protein is about numbers

- Example mare needing 400 grams of protein
- Can feed :
  - 2.8 kg of 14% stud cubes
  - 3.3 kg of 12% competition cubes
  - 4.0 kg of 10% cool feed cubes

# Protein example

- Any of those diets meet the protein needs
- But think about the energy each option provides...

# Energy warning !

- 2.8 kg stud cubes = 32.2 MJDE
- 3.3 kg competition cubes = 36.3 MJDE
- 4.0 kg cool cubes = 43.2 MJDE

# Foal diets

- This is why foal diets are so high in protein
- They are designed to be fed in small amounts
- Foals stomach is small !!

- It comes down to how 'fast' you want to grow the foal
- Doing it slow and steady - small amounts of foal pellets / yearling cubes
- Pushing for fast growth / prepping - higher volumes of lower protein diet eg stud cubes / competition cubes

# THANK YOU

ANY QUESTIONS ?



Connolly's  
**RED MILLS**  
SINCE 1908