Optimizing Broodmare Nutrition

PEI Standardbred Breeders Association– February 11, 2023
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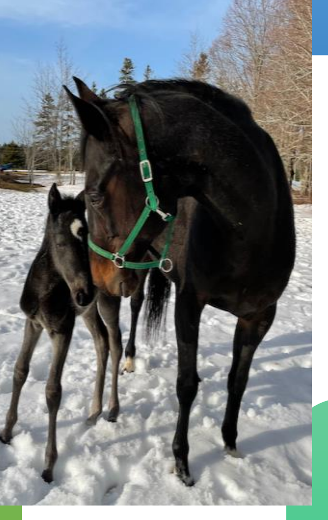
Broodmare nutrition

Understand Body Condition Scoring



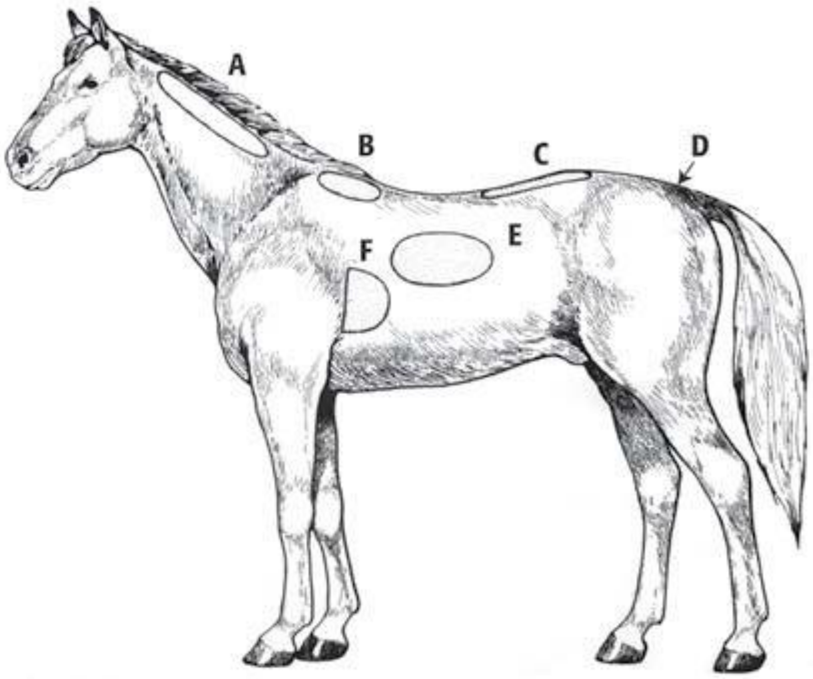
Vitamin/Mineral supplementation

Energy requirements throughout pregnancy

Body Condition Scoring

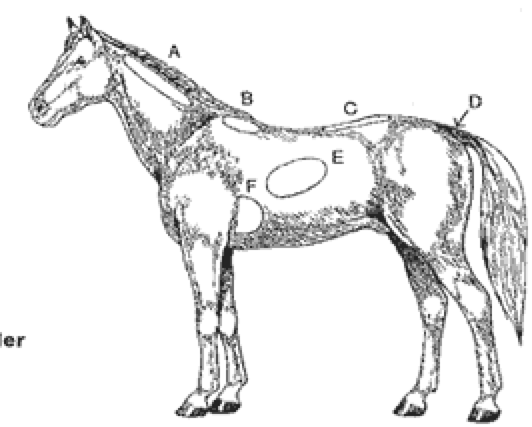
Fat deposition:

A. Along the neck
B. Along the withers
C. Crease down back
D. Tailhead
E. Ribs
F. Behind shoulder



HENNEKE SYSTEM						
CONDITION	NECK	WITHERS	LOIN	TAILHEAD	RIBS	SHOULDER
1 POOR	Bone structure easily noticeable Animal extremely emaciated; no fatty tissue can be felt	Bone structure easily noticeable	Spinous processes project prominently	Tailhead (pinbones) and hook bones projecting prominently	Ribs projecting prominently	Bone structure easily noticeable
2 VERY THIN	Faintly discernible Animal emaciated	Faintly discernible	Slight fat covering over-base of spinous processes. Transverse processes of lumbar vertebrae feel rounded. Spinous processes are prominent	Tailhead prominent	Ribs prominent	Faintly discernible
3 THIN	Neck accentuated	Withers accentuated	Fat buildup halfway on spinous processes but easily discernible. Transverse processes cannot be felt	Tailhead prominent but individual vertebrae cannot be visually identified. Hook bones appear rounded, but are still easily discernible. Pin bones not distinguishable	Slight fat cover over ribs. Ribs easily discernible	Shoulder accentuated
4 Moderately THIN	Neck not obviously thin	Withers not obviously thin	Negative crease along back	Prominence depends on conformation, fat can be felt. Hook bones not discernible	Faint outline discernible	Shouldner not obviously thin
5 MODERATE	Neck blends smoothly into body	Withers rounded over spinous processes	Back level	Fat around tailhead beginning to feel spongy	Ribs cannot be visually distinguished but can be easily felt	Shoulder blends smoothly into body
6 Moderately FLESHY	Fat beginning to be deposited	Fat beginning to be deposited	May have slight positive crease down back	Fat around tailhead feels soft	Fat over ribs feels spongy	Fat beginning to be deposited
7 FLESHY	Fat deposited along neck	Fat deposited along withers	May have positive crease down back	Fat around tailhead is soft	Individual ribs can be felt, but noticeable filling between ribs with fat	Fat deposited behind shoulder
8 FAT	Noticeable thickening of neck Fat deposited along inner buttocks	Area along withers filled with fat	Positive crease down back	Tailhead fat very soft	Difficult to feel ribs	Area behind shoulder filled in flush with body
9 Extremely FAT	Bulging fat Fat along inner buttocks may rub together. Flank filled in flush.	Bulging fat	Obvious positive crease down back	Building fat around tailhead	Patchy fat appearing over ribs	Bulging fat

Henneke System of Body Condition

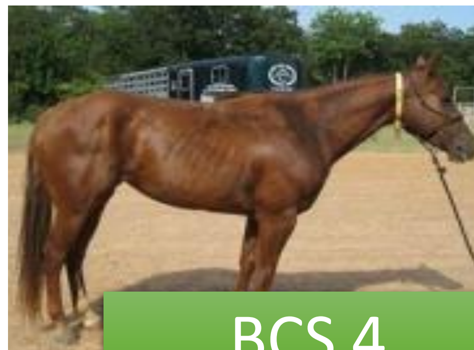


A. Along the neck
B. Along the withers
C. Loin/Crease down the back
D. Tailhead
E. Ribs
F. Behind the soulder

Add scores and divide by six.

Body Condition Scoring

BCS 3



BCS 4

BCS 5

BCS 6

BCS 7

Body Condition Scoring

- Affected by:
  - Performance/work activities
  - Feed availability
  - Reproductive activities
  - Weather
  - Dental/health problems
- Not affected by:
  - Age
  - Breed
  - Height

Body Condition Scoring

- Ideal broodmare BCS: 6-7

- Cycle earlier in year (earlier estrus)
- Fewer cycles per conception
- Higher pregnancy rates

Table 2. Reproductive performance of mares in varying body condition.*

Body Condition	Cycles per Conception	Conception Rate (%)
≤ 4.5	2.8	71
5.0 - 6.5	1.4	93
≥ 7.0	1.4	96

* Adapted from Henneke et al. (1984).

Body Condition Scoring

- Ideal broodmare BCS: 6-7

- Maintain Pregnancy
  - Greater early embryonic loss with BCS ≤ 4
- Easier for delivery
- Better prepared for lactation

Body Condition Scoring

- Improving BCS in underconditioned mares
- 45lb gain → each incremental BCS increase
- Best to do during early gestation

Improving ONE Condition Score

Days Needed	Daily Gain	Additional Grain Needed
60	0.75 lbs/day (0.35 kg/day)	4.5 lbs/day (2.0 kg/day)
90	0.50 lbs/day (0.22 kg/day)	3.0 lbs/day (1.4 kg/day)
120	0.40 lbs/day (0.2 kg/day)	2.3 lbs/day (1 kg/day)

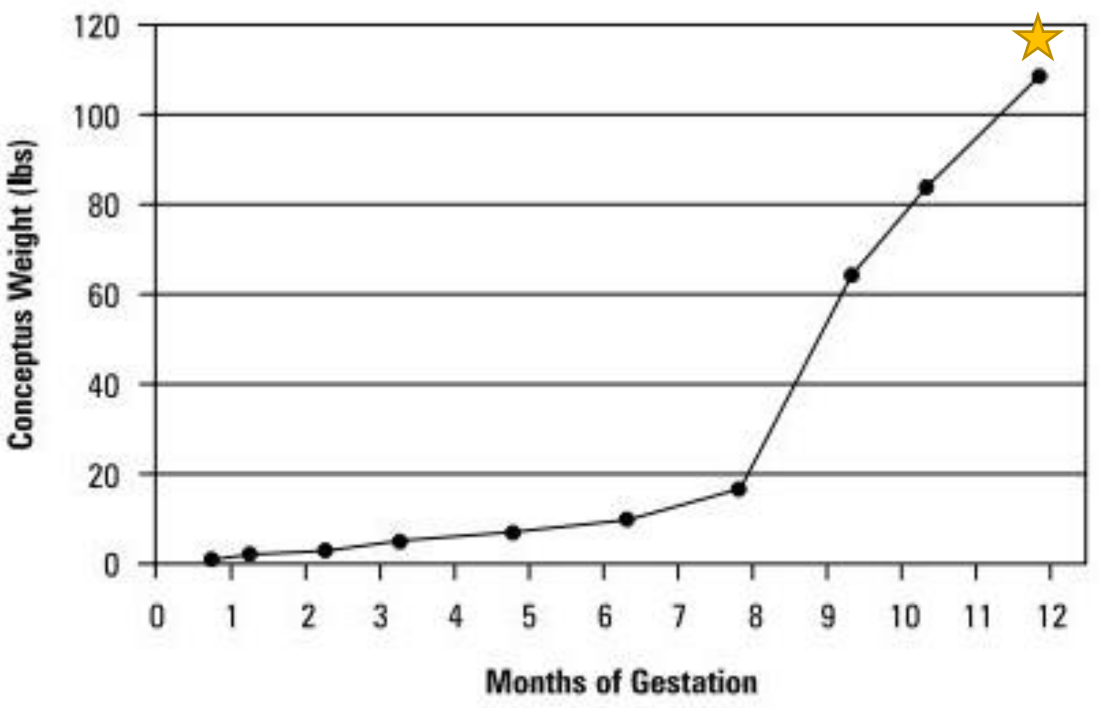
Gov't Alberta – Agri-facts Agdex 460/50-6

Broodmare Nutrition

- Considerations:
  - Mare's BCS
  - Exercise/activity requirements
  - Quality of feed available
  - Mare's stage of gestation/production

Broodmare Nutrition

- Mares will gain 12-14% of their BW during pregnancy
  - ⅔ during last 3 months (rapid fetal growth)



Broodmare Nutrition

Early – Mid Gestation

(Months 1-8)

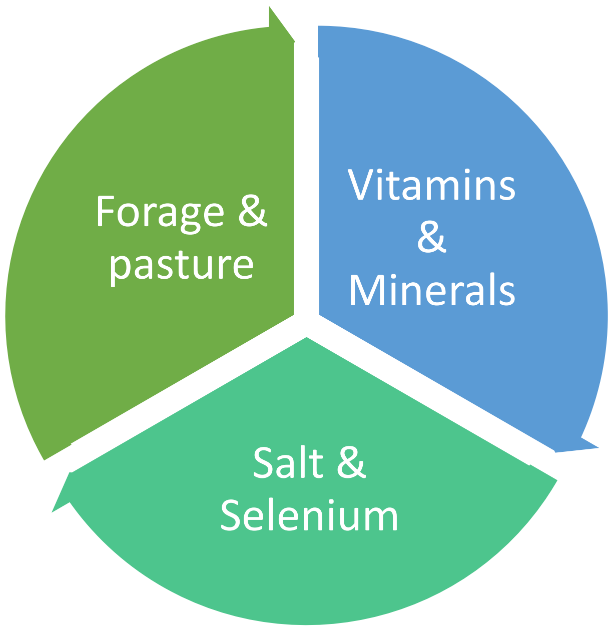
Late Gestation

(Months 9-11)

Lactation

Broodmare Nutrition

- Nutrient requirements change drastically throughout gestation & lactation:
  - Protein
  - Minerals
    - Calcium
    - Phosphorus
    - Selenium
  - Trace minerals
    - Copper, Zinc, Iodine
  - Vitamins
    - A, D, E



Broodmare Nutrition

- Nutritional components vary significantly for different feeds

Average nutrient component of feeds

Feed	Protein %	Calcium %	Phosphorus %
Grass Hay	8	0.5	0.15
Legume Hay	18	1.75	0.2
Mixed hay	10-16	1.5	0.2
Oats	11	0.1	0.35

F1 **BASIC FEED PACKAGE**
DM, Protein

F2 **FORAGE PACKAGE** (Non-Silage)
DM, Protein, ADF, DE, TDN,
Ca, P, K, Mg, Cu, Zn

F3 **SILAGE PACKAGE**
DM, Protein, ADF, DE, TDN, NE_G, NE_M, NE_L
Ca, P, K, Mg, Cu, Zn, pH, Bound Protein

F4 **MIXED RATION PACKAGE**
DM, Protein, Ca, P, K, Mg, Cu, Zn, Salt, Na

Prince Edward Island CANADA

Prince Edward Island Analytical Lab

Broodmare Nutrition

- Protein
  - Require ~20% increase in each stage
- Vitamin A
  - Fertility, embryonic development and fetal growth

Life stage	Protein (%)	Vitamin A (IU/kg)
Early-mid gestation (months 1-8)	8-10	30
Late gestation (months 9-11)	10-12	60
Early lactation (months 1-3)	14	60

Broodmare Nutrition

- Minerals – Calcium & Phosphorus
- Maintain 1.5-2:1 ratio
- Different nutrient components for different feeds

Average daily values of Calcium & Phosphorus needed for horses

Life stage	Calcium (g/day)	Phosphorus (g/day)
Adult - maintenance	30	15
Early-mid gestation (months 1-8)	30	15
Late gestation (months 9-11)	45	30
Early lactation (months 1-3)	55	35

Broodmare Nutrition

- Selenium:
  - 1-3mg/day
- Salt:
  - 1oz/day (= 2 Tbsp) → maintenance
  - Heavy exercise will increase this requirement
  - Iodized usually preferred

Broodmare Nutrition

- Early-mid gestation (months 1-8)
  - Maintenance
- Forage: 80-100% ration
- Supplement vitamins/minerals

Horse	% of Body Weight		% of Diet	
	Forage	Concentrate	Forage	Concentrate
Mares				
Maintenance Early pregnancy	1.5 - 2.0	0 - 0.5	100	0
Late pregnancy	1.0 - 1.5	0.5 - 1.0	70	30
Early lactation	1.0 - 2.0	1.0 - 2.0	50	50
Late lactation	1.0 - 2.0	0.5 - 1.5	65	35

Broodmare Nutrition

- Early-mid gestation (months 1-8)
- Feed by weight (not volume)
  - 1.5-2% BW per day → high-quality forage
- Not all hay is created equal!
  - Hay type, maturity, etc

Broodmare Nutrition

- Average square bale:
  - 40-75lbs (~10-12 flakes per bale)
- 40lbs ÷ 12 = 3 lbs/flake

(Average 1000lb STBD at 2% BW forage /day = 20lbs)

= requires 7 flakes per day

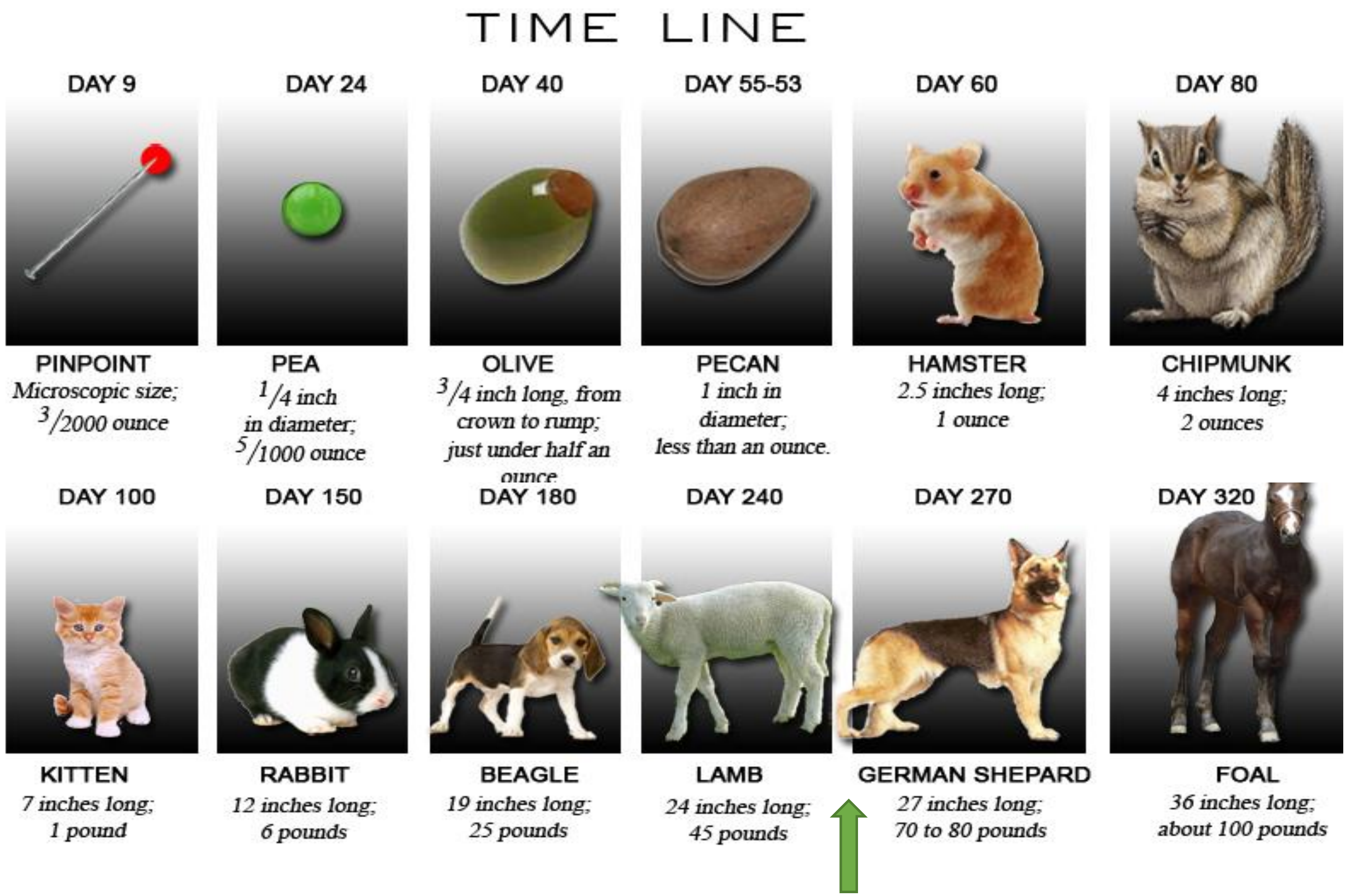
Broodmare Nutrition

- 1.5-2% BW per day
- Forage: 80-100% ration
- Pasture *may* decrease hay requirements

Example feeding programs for 1000lb broodmare in early-mid gestation			
Feed	**Ration 1**	**Ration 2**	**Ration 3**
Hay	20lbs	16lbs	16lbs
Oats	-	3-5lbs	-
Commercial feed mix	-	-	3-5lbs
Mineral mix	As directed	As directed	-
Salt	Free choice	Free choice	Free choice

Broodmare Nutrition

- Late gestation: 60-65% of fetal growth



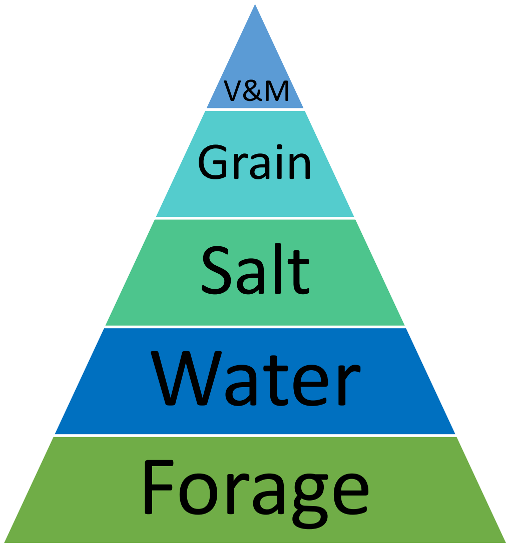
Broodmare Nutrition

- Late gestation:
  - Fetal growth: 1lb/day
  - Increased protein, calcium, phosphorus, vitamin A
- Gradual feed changes to maintain BCS and meet nutritional needs

Horse	% of Body Weight		% of Diet	
	Forage	Concentrate	Forage	Concentrate
Mares				
Maintenance Early pregnancy	1.5 - 2.0	0 - 0.5	100	0
Late pregnancy	1.0 - 1.5	0.5 - 1.0	70	30

Broodmare Nutrition

- Late gestation:
  - Feeding changes required
  - Addition of concentrate

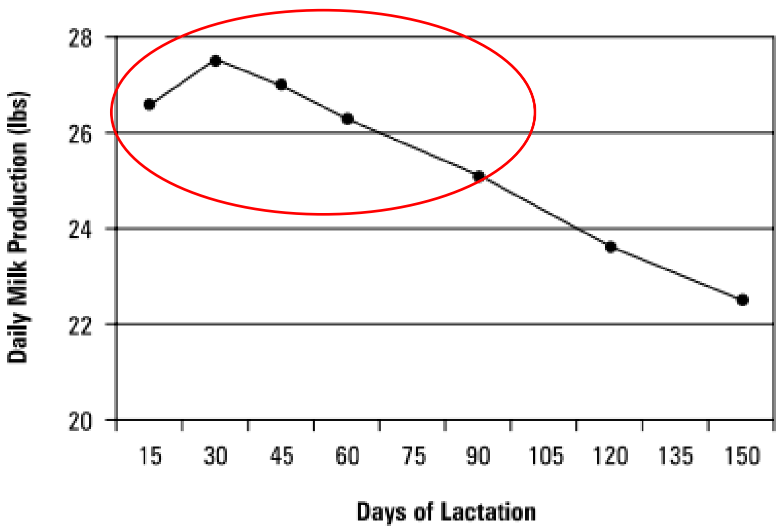


Example feeding programs for 1100lb broodmare in late gestation

Feed	Ration 1	Ration 2	Ration 3
Hay	24lbs	18lbs	18lbs
Oats	-	5-11lbs	-
Commercial grain mix	-	-	5-11lbs
Mineral mix (Ca:P, protein)	As directed on label	As directed on label	-
Salt	Free choice	Free choice	Free choice

Broodmare Nutrition

- Early lactation: high physiological stress on mare
- Produce 2-3% BW/day as milk
  - Up to 30lbs milk each day
- Amount and composition of milk changes with stage of lactation



Broodmare Nutrition

- Early lactation: significant ↑ nutrition requirements
- Milk composition:
  - High volume of protein, calcium, phosphorus, fat
- Concentrate required
  - % of diet: 50:50 (forage:concentrate)
  - 1-2% BW of each per day

Broodmare Nutrition

Guaranteed Analysis

Protein	16.50%
Fat	7.00%
Fibre	15.00%
Calcium	1.35%
Phosphorus	0.75%
Sodium	0.45%
Vitamin A	10000 I.U./kg
Vitamin D3	2200 I.U./kg
Vitamin E	300 I.U./kg
Selenium	0.40 mg/kg

Directions for Use:

"…recommended for the gestating, lactating mare and nursing foal. Feed in conjunction with water and a minimum of 1.5% body weight of a long stemmed forage."

Daily amount of Evolution Maternity

kg / 100 kg of body weight

	Minimum	
Broodmares		
Gestation	0.73	1.00
Lactation	0.91	1.25
Foals		
4 - 6 Months	1.00	1.25
7-18 Months	0.91	1.25

Broodmare Nutrition

Other considerations:

- Water
  - Normal is 25-40L per day
  - Lactation increases this requirement by 50-200%
- Parasite control
- GI health
- Dental care

THANK YOU