



MARE & FOAL NUTRITION

Body Condition Scoring: A Management Tool for the Broodmare Owner

The body condition of mares can influence conception and pregnancy rates and the dietary energy needs for reproduction. Mares in good or fat condition have higher conception rates whether they are losing or maintaining body weight. However, thin mares maintaining weight at the time of breeding are twice as likely not to conceive as thin mares gaining weight. The Henneke body condition scoring system has been developed to evaluate and classify horses based on relative indicators of body fat content, with scores ranging from 1 to 9. Although this fact sheet addresses the effect of body condition on the reproductive performance of mares, the body condition scoring system also can be used effectively on mature horses in all production situations to assess and adjust body condition.

The Body Condition Scoring System

Body condition is estimated based on body fat indicators that help estimate stored

body energy. The condition score system compares animals based on their relative differences in fat content.

Body fat is determined by visual appraisal and palpation on the following areas:

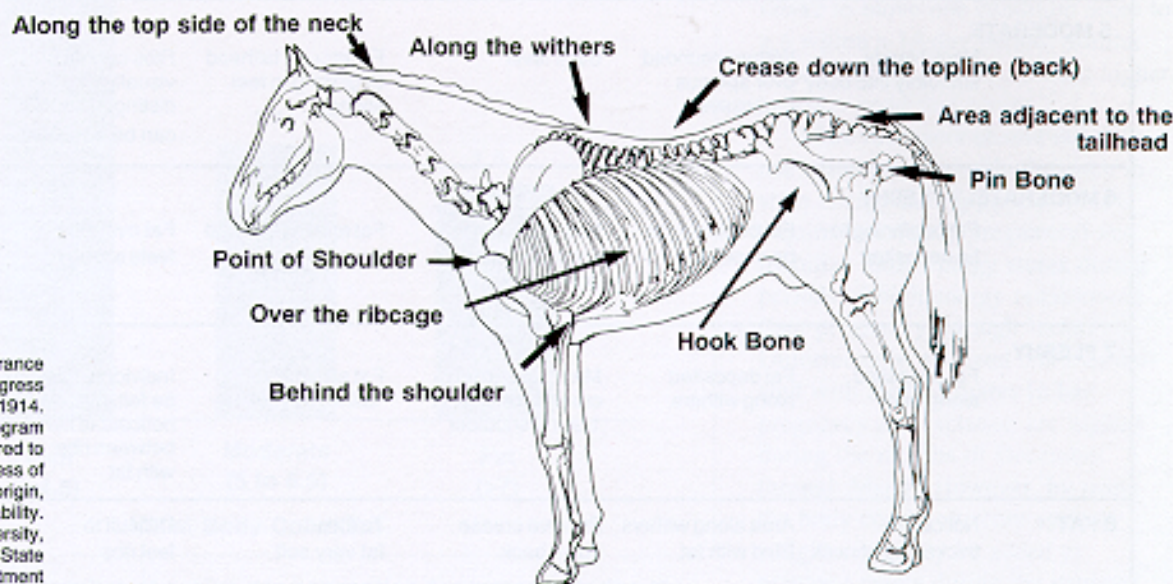


Figure 1: Body condition evaluation areas.

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Table 1. A Practical System for Assigning Body Condition Scores to Horses

CONDITION	NECK	WITHERS	LOIN	TAILHEAD	RIBS	SHOULDER
1 POOR	Bone structure noticeable Animal extremely emaciated; no fatty tissue can be felt	Bone structure easily noticeable	Spinous processes project prominently	Tailhead, pin bones, and hook bones project prominently	Ribs project 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	Shoulder 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; point-of-shoulder not discernable
7 FLESHY	Fat deposited along neck	Fat deposited along withers	May have positive crease down back behind shoulder	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

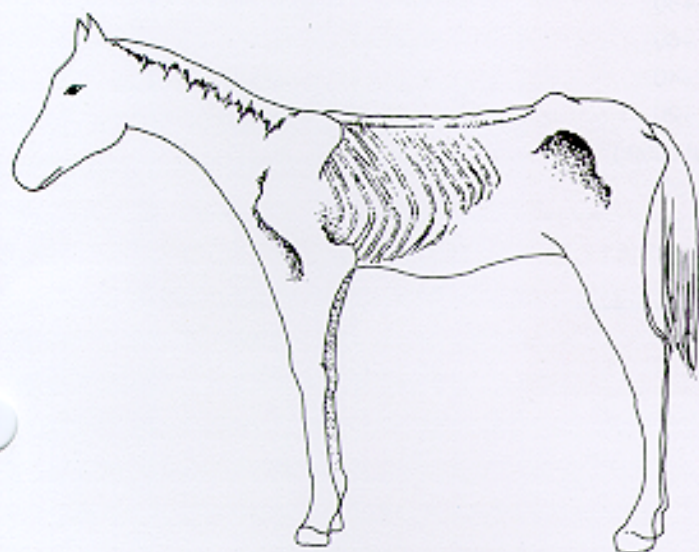
Although primary scoring decisions are based largely on visual appearances, manual palpation also is helpful when determining a score, especially for horses with long coats. Under normal circumstances, all six evaluation areas are given equal emphasis. The condition scoring system evaluates body condition and not quality or conformation. However, because of unique conformation problems including prominent withers, flat loins, weak top lines, or

injuries, one or more criteria may be eliminated from visual appraisal. In such instances, additional emphasis should be placed on palpation or visual evaluation of remaining sites.

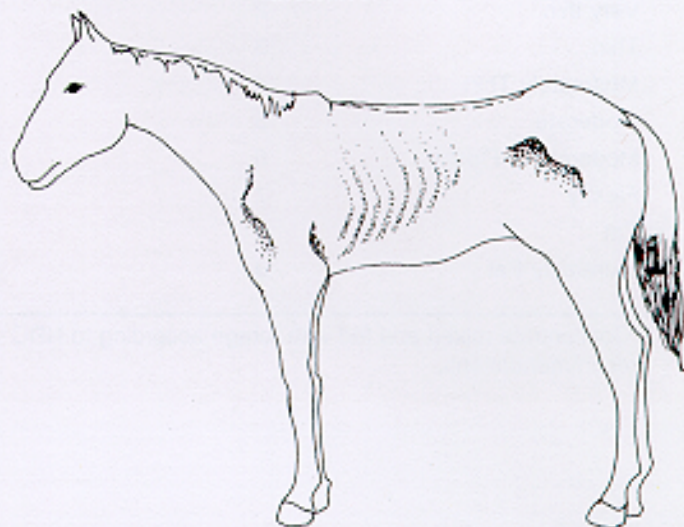
When evaluating pregnant mares, emphasis should be placed on fat deposition behind the shoulder, along the withers, over the hook and pin bones, and near the tailhead. Typically, the weight of the fetus will pull skin and muscle tighter over the top line and ribcage of mares in their last

trimester. Subsequently, fat evaluation on these areas would be misleading.

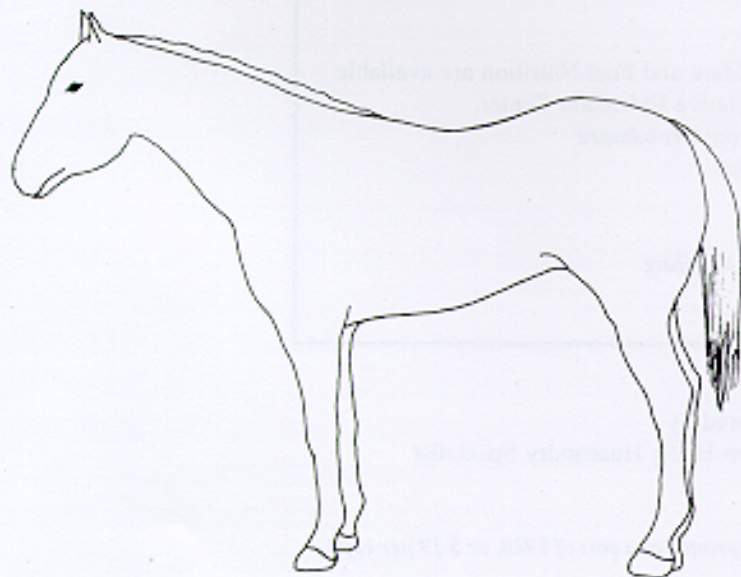
Texas A&M's Henneke nine-category scoring system ranges from one (poor), to nine (extremely fat) (Table 1 and Figure 2.). Scores can be assigned on one-half-unit increments. All conditions for a given score must be met to assign that particular score. If one or more conditions for a given score are not met, the score should be adjusted upward or downward as indicated.



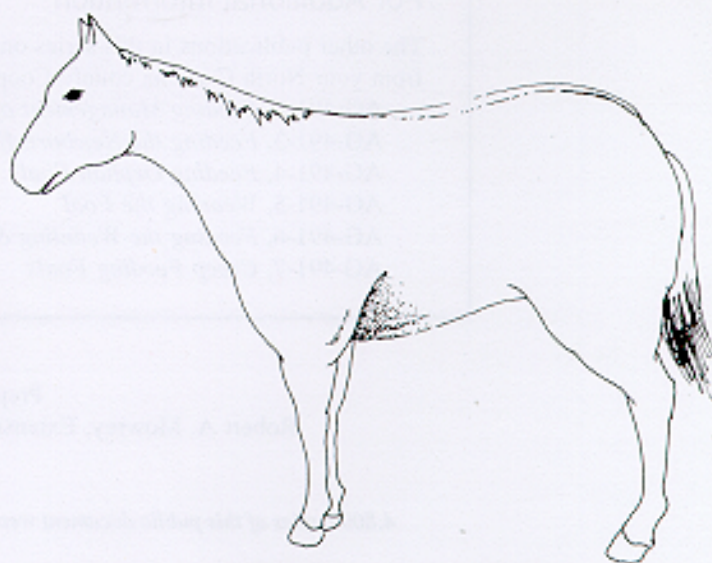
Score 1



Score 3



Score 6



Score 9

Figure 2. Examples of four body condition scores.

Principles of Regulating Body Condition

Excess dietary energy is metabolized and stored as body fat. The mare has the ability to deposit large quantities of body fat for use when her energy requirements exceed the energy content of the diet. This situation occurs frequently in mares moving from late gestation into lactation. The National Research Council (NRC) reports that energy requirements for the broodmare increase by more than 50 percent from pregnancy to lactation. The high energy requirement is generally met by altering the forage-to-grain ratio in the diet (Table 2). Forage intake must be reduced to enable a higher intake of the more energy-dense concentrates or grains. Mares in a thin body condition during late pregnancy, with relatively little energy stored in the form of body fat, will require significantly higher levels of dietary energy to maintain body condition during lactation than their moderately conditioned counterparts. Such mares may require levels of grain in excess of the 2 pounds per 100 pounds of body weight recommended by the NRC (Table 2). High grain intake in excess of 2 percent of body weight is more likely to cause a colic or founder. Such feeding situations should be avoided at all costs. Because thin mares that lack energy reserves cannot be safely fed adequate dietary energy to restore body condition, their milk production, and rebreeding efficiency are depressed during early lactation.

Preconditioning a broodmare by closely monitoring her body condition is an alternative that will permit a mare to store energy in times of low need and recall the energy when needed. Broodmares can be maintained in a moderate condition when entering the breeding season. Energy intake can be regulated by varying the forage-to-concentrate ratio (Table 2) to ensure additional weight gain or body reserves. At foaling, the body reserves provide a vital source of energy to meet the elevated requirements of milk production during

early lactation. Under these conditions, a lactating mare can be fed a safe diet with moderate grain intake in accordance with NRC recommendations. The mare will mobilize her stored energy reserves and convert body fat into a usable energy source.

Body Conditioning Aids Fertility and Profits

The following results were obtained in several experiments at Texas A&M University to study the influence of body condition at foaling on rebreeding efficiency and foal growth using 927 mares. Mares were classified as thin (condition score 4.5 or less), moderate (condition score 5 to 6.5) or fat (condition score 7 and above) at foaling.

- Mares foaling in thin condition had impaired reproductive performance during rebreeding, even when fed to meet energy requirements for lactation.
- Increasing the energy fed to thin mares during lactation improved rebreeding efficiency. However, the large amount of feed required to produce weight gains increased the risk of colic and founder and was very expensive.

- Mares foaling in fat condition used stored body energy for efficient reproduction and lactation (even when losing weight), exhibited no foaling problems, and achieved high rebreeding efficiency.
- Open mares, maiden mares, and foaling mares entering the breeding season in moderate or higher condition achieved or maintained higher reproductive efficiency than their counterparts in thin condition.
- Increasing body condition above moderate levels before the breeding season did not impair rebreeding performance in mares but was of no benefit unless mares were losing weight during the breeding season.

In general, mares with moderate to high stores of fat cycled earlier, had higher pregnancy rates (Figure 3), had lower numbers of cycles per conception (Figure 4), and sustained more pregnancies than thin mares.

Under ideal conditions, mares should enter the breeding season in a moderate condition (condition score of 5), be maintained in moderate to fleshy condition (condition score of 6

Table 2. Expected Feed Consumption by Mature Horses

	Forage	Concentrate	Total
	(Percent Body Weight) ^a		
Mature horses			
Maintenance ^b	1.5 to 2.0	0 to 0.5	1.5 to 2.0
Mares, late gestation ^c	1.0 to 1.5	0.5 to 1.0	1.5 to 2.0
Mares, early lactation ^d	1.0 to 2.0	1.0 to 2.0	2.0 to 3.0
Mares, late lactation ^e	1.0 to 2.0	0.5 to 1.5	2.0 to 2.5
Working horses			
Light work	1.0 to 2.0	0.5 to 1.0	1.5 to 2.5
Moderate work	1.0 to 2.0	0.75 to 1.5	1.75 to 2.5
Intense work	0.75 to 1.5	1.0 to 2.0	2.0 to 3.0

Source: Adapted from *Nutrient Requirements of the Horse*, fifth revised edition, 1989. National Academy Press, Washington, D.C. Values expressed on an air-dry feed (90 percent dry matter basis).

a. Also expressed as pounds of feed per 100 pounds of body weight.

b. Includes mature open mares and pregnant mares in their first eight months of gestation.

c. Pregnant mares months 8 through 11.

d. From foaling to 3 months of lactation.

e. From third month lactation to weaning.

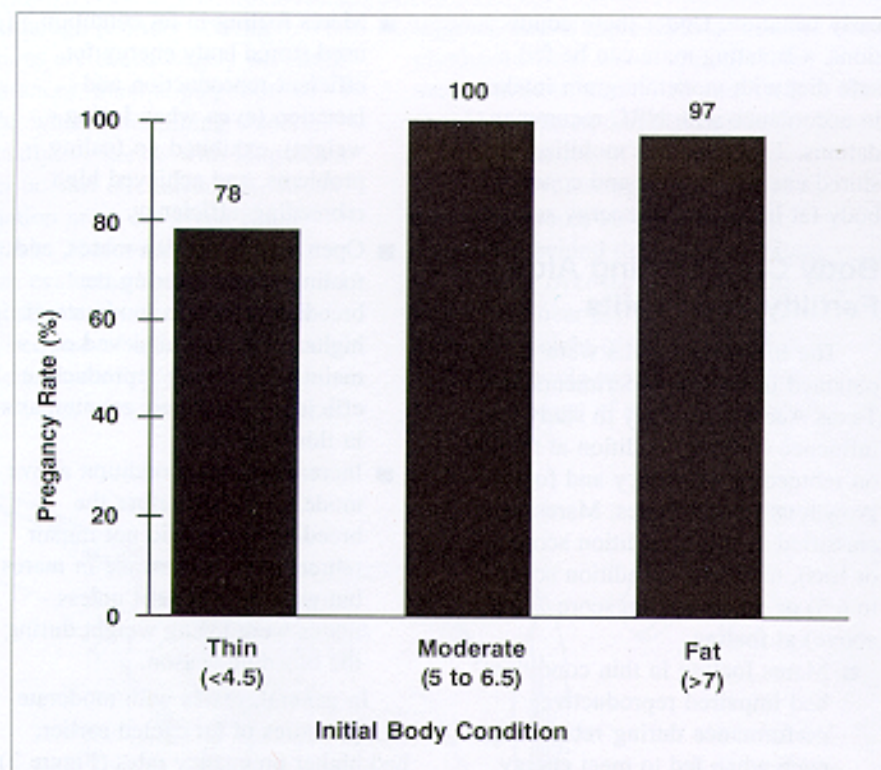


Figure 3. Pregnancy rates of mares entering the breeding season or foaling in thin, moderate, or fat condition.

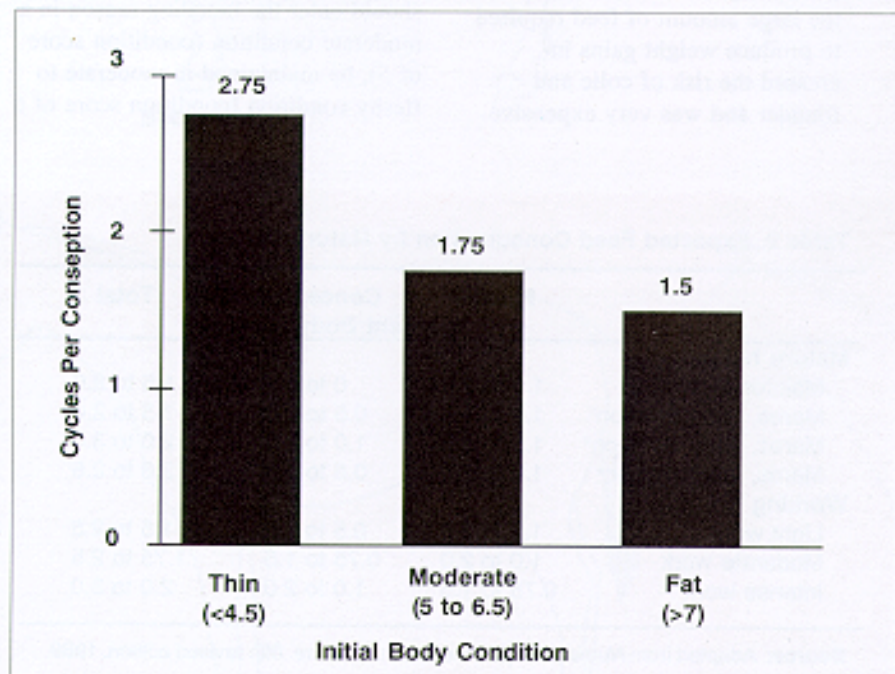


Figure 4. Average number of cycles per conception for mares entering the breeding season or foaling in thin, moderate, or fat condition.

to 7) throughout early gestation, gain weight during late gestation, and foal in a fleshy to fat condition (condition score 7 to 8). However, under no circumstances should mares be permitted to become obese (condition score 8.5 to 9). Obese mares typically display physiological disorders that affect reproductive function as a result of hormonal imbalances and abnormal endocrine function.

The ability to adjust body condition scores either upward or downward safely by regulating energy intake is extremely important. Researchers have reported that either increasing or decreasing energy intake by 10 to 15 percent above or below the animal's requirement will result in weight gain or loss and an appropriate adjustment in the condition score. This can be accomplished by adjusting the grain (concentrate) portion of the diet by a 20 percent increment to move either up or down one condition score. In the example in Table 3, the condition score of 6, moderate to fleshy, has been identified as the desirable score. A mare with a 5 condition score would require a 20 percent increase in concentrate intake above the original intake to move one condition score to a 6 within a 14-day period. Similar adjustments can be made from higher to lower condition scores.

Mare managers should strive to use systems that enable the mare to store energy during periods of low requirement (early pregnancy) and mobilize those energy stores during periods of high energy requirement (late pregnancy through lactation). Unfortunately, the feed costs associated with feeding mares in late pregnancy and lactation are highest during the months of December through March. However, by using the body condition score system, weight can safely be added to pregnant mares during the summer and early fall when feed costs are lower and pastures more plentiful. The mare will enter late pregnancy in the fall with more body condition and

energy reserves. Subsequently, lower levels of feed will be required to maintain the mare's body condition throughout late pregnancy and early lactation (December through March) when feed prices are the highest.

Proper implementation of this system will result in lower feed costs, safer diets, and less chance of nutrition-related disease while ensuring maximum reproductive performance.

Table 3. Regulating Grain Intake to Adjust Body Condition Score

Condition	Score	Increase or Decrease
		% concentrate*
Poor	1	+100
Very thin	2	+80
Thin	3	+60
Moderately Thin	4	+40
Moderate	5	+20
Moderate to Fleshy	6	(Ideal score)
Fleshy	7	-20
Fat	8	-40
Extremely Fat	9	-60

*Concentrate mixed and fed with forage according to NRC recommendations.

For Additional Information

The other publications in this series on Mare and Foal Nutrition are available from your North Carolina county Cooperative Extension Center.

AG-491-1, *Feeding Management of the Broodmare*

AG-491-3, *Feeding the Newborn Foal*

AG-491-4, *Feeding Orphan Foals*

AG-491-5, *Weaning the Foal*

AG-491-6, *Feeding the Weanling & Yearling*

AG-491-7, *Creep Feeding Foals*

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