



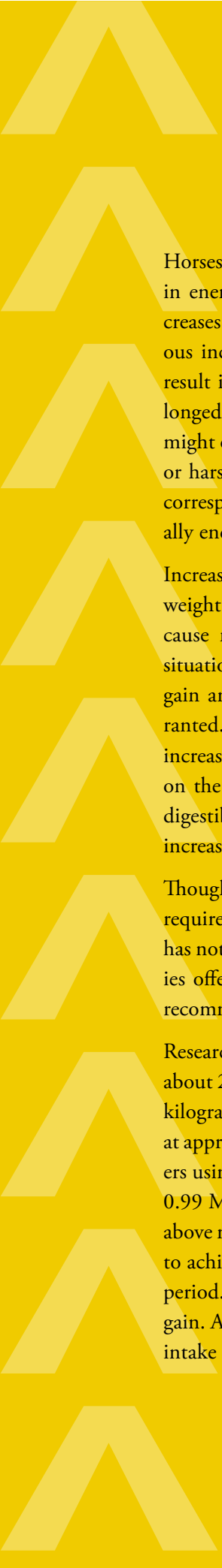
**BEFORE**

**Increasing  
body condition  
takes TIME  
and PATIENCE**

Weight gain is not achieved overnight, not even in the best of circumstances. The condition score of this nine-year-old gelding in the larger photograph would be considered moderate, though much improved from his previous state. Five months elapsed between photographs.

# BULKING UP

Numerical scoring is the most widely accepted standardized method of assessing body condition in horses. Though different systems exist, the most common uses a scale of 1 to 9, with 1 denoting emaciation and 9 designating obesity (see sidebar on page 9). When this method is practiced and consistently applied, body condition scoring provides a reliable means of monitoring body weight.



Horses gain and lose weight through variations in energy intake and energy expenditure. Increases in energy intake without a simultaneous increase in energy expenditure will likely result in weight gain. On the contrary, a prolonged increase in energy expenditure, which might occur with a more demanding workload or harsh environmental conditions, without a corresponding boost in energy intake will usually end in weight loss.

Increasing the body mass of horses through weight gain is a particularly timely topic because more horses are turning up in rescue situations and a clear understanding of weight gain and changes in body condition are warranted. Achieving weight gain, and thus an increase in body condition, depends largely on the maturity of the horse. The amount of digestible energy (DE) needed for weight gain increases as horses age.

Though the amount of DE above maintenance requirements needed for each kilogram of gain has not been researched extensively, a few studies offer a solid foundation on which to base recommendations.

Researchers found that mature horses required about 24 Mcal DE above maintenance for each kilogram of gain. In another study performed at approximately the same time, other researchers using Standardbred geldings estimated that 0.99 Mcal metabolizable energy (ME) per day above maintenance requirements was necessary to achieve a gain of 5-6 kg over a three-month period. This equates to about 18 Mcal DE/kg gain. Another group of scientists measured DE intake of Belgian and Percheron horses, and

indicated that 16-20.7 Mcal DE beyond maintenance were needed per kilogram gain.

Using these studies, it seems that approximately 16-25 Mcal DE are required for every kilogram of gain. But how much gain is necessary to achieve a change in body condition?

This too is an area of little study. Some nutritionists estimated that weight gains of 33-45 kg were linked with an increase of about

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two condition score increments (from 4 to 6, for example). Therefore, each increment requires about 16-20 kg of weight gain. Other researchers reported a much higher value per incremental change in condition score. They indicated that condition scores of Thoroughbred geldings that gained 93 kg increased from 4.3 to 7, suggesting approximately 34 kg of gain were associated with each incremental increase in condition score. *Nutrient Requirement of Horses* suggests that a weight gain of 16-20 kg will increase the body condition of a 500-kg horse from a four to a five. Obviously, there is some variance among the results of these studies; thus, pinpointing an exact value is impossible.

A realistic timeline for weight gain must be established, as changes in body weight occur slowly. Weight-gain goals should be measured in months, not weeks. Trying to add weight too quickly might predispose a horse to poten-

tially life-threatening problems such as colic and laminitis, as well as other health risks caused by high-grain diets such as subclinical acidosis. To achieve reasonable weight gain, a moderate increase in DE intake above maintenance requirements is ideal.

**[TABLE 1] Estimated increases in digestible energy (DE) intake necessary to change condition score of a 500-kg horse from 4 to 5.<sup>1,2</sup>**

Time period to accomplish gain	DE above maintenance (Mcal/day)	Percent increase in DE above maintenance
60 days	5.3 - 6.7	32 - 41
90 days	3.6 - 4.4	22 - 27
120 days	2.7 - 3.3	16 - 21
150 days	2.1 - 2.7	13 - 16
180 days	1.8 - 2.2	11 - 14

<sup>1</sup>Assuming one incremental change in condition score requires 16-20 kg of gain and that 1 kg of gain requires 20 Mcal DE above maintenance.

<sup>2</sup>Taken from *Nutrient Requirements of Horses* (2007).

Using the assumption that one incremental change in condition score requires 16-20 kg of gain and that 1 kg of gain requires 20 Mcal DE above maintenance, body condition can be elevated one score in as little as 60 days by increasing the percentage of DE above maintenance by 32-41%.

The percentage DE required for gain drops as more time is allotted for weight increases. The same amount of weight gain can be achieved in 180 days by a much slighter increase in DE above maintenance, just an average of 2 Mcal, or 11-14% increase in DE above maintenance (Table 1).

In the proceedings of the 2008 Kentucky Equine Research Nutrition Conference, noted equine nutritionist Laurie Lawrence, Ph.D., estimated the DE above maintenance necessary to achieve weight gain over different periods of time. She used as her model a 500-kg horse at maintenance with a target weight of 525 kg. Based on the preceding information, a weight gain of 25 kg should result in a one-point change in condition score.

Without large quantities of concentrate and high-quality forage, it is likely impossible to achieve the desired 25-kg gain in 30 days. Whereas a horse on the 30-day plan might have to consume 6-8 kg of concentrate a day as well as high-quality forage, the same horse on the 90-day plan could consume 2-3 kg concentrate and 10 kg of good-quality forage for identical weight gain. Small concentrate meals are more conducive to gastrointestinal health. Therefore, a long-range plan for weight gain is most beneficial to the well-being of the horse.

Exercise increases the total DE required above maintenance for weight gain. If a horse is to be exercised, more time should be built into the weight-gain schedule.

**[TABLE 2] Selected weight-gain schedules for adult horses.**

Days to target weight	ADG [kg/d] <sup>1</sup>	DE to maintain current weight [Mcal] <sup>*</sup>	DE for gain [Mcal]	Total daily DE [Mcal]
30 days	0.8	18.6	20.0	38.6**
60 days	0.4	18.6	10.0	28.6
90 days	0.3	18.6	7.5	26.1
120 days	0.2	18.6	5.0	23.6


<sup>1</sup>Average daily gain. <sup>\*</sup>Based on an average body weight of 512.5 kg. <sup>\*\*</sup>Not recommended.

Exercise increases energy requirements substantially. When planning a weight-gaining feed program, be sure to schedule more time if the horse is in work.



PHOTOGRAPH | MARK LLEWELLYN

### ADDITIONAL READING

For more information, read "Assessing Energy Balance" by Laurie Lawrence, Ph.D., published in the proceedings of the 2008 Kentucky Equine Research Nutrition Conference, pages 119-125. To purchase the proceedings, go to [www.ker.com/store](http://www.ker.com/store), and click the link titled KER Books and CDs. 

### A MATTER OF NUMBERS, USING THE BODY CONDITION SCORE SYSTEM

The body condition score system was developed by researchers to encourage horsemen to discuss body weight in a recognizable, universal way. Terms such as "thin" or "pudgy" are nothing if not ambiguous, so the system was devised to help horsemen visualize a degree of thinness or fatness based on certain criteria. Introduced to the industry more than 25 years ago, the system has achieved its goal of providing a foundation for the way scientists and horsemen describe body condition.

SCORE	DESCRIPTION
<b>1</b> Poor	Animal extremely emaciated; spinous processes, ribs, tailhead, tuber coxae, and ischii projecting prominently; bone structure of withers, shoulders, and neck easily noticeable, no fatty tissue can be felt
<b>2</b> Very thin	Animal emaciated; slight fat covering over base of spinous processes; transverse processes of lumbar vertebrae feel rounded; spinous processes, ribs, tailhead, tuber coxae, and ischii prominent; withers, shoulders, and neck structure faintly discernible
<b>3</b> Thin	Fat buildup about halfway on spinous processes; transverse processes cannot be felt; slight fat cover over ribs; spinous processes and ribs easily discernible; tailhead prominent, but individual vertebrae cannot be identified visually; tuber coxae appear rounded but easily discernible; tuber ischii not distinguishable; withers, shoulders, and neck accentuated
<b>4</b> Moderately thin	Slight ridge along back; faint outline of the ribs discernible; tailhead prominence depends on conformation, fat can be felt around it; tuber coxae not discernible; withers, shoulders, and neck not obviously thin
<b>5</b> Moderate	Back is flat (no crease or ridge); ribs not visually distinguishable but easily felt; fat around tailhead beginning to feel spongy; withers appear rounded over spinous processes; shoulders and neck blend smoothly into body
<b>6</b> Moderately fleshy	May have slight crease down back; fat over ribs spongy; fat around tailhead soft; fat beginning to be deposited along the side of withers, behind shoulders, and along the sides of neck
<b>7</b> Fleshy	May have crease down back; individual ribs can be felt but noticeable filling between ribs with fat; fat around tailhead soft; fat deposited along withers, behind shoulders, and along neck
<b>8</b> Fat	Crease down back; difficult to feel ribs; fat around tailhead very soft; area along withers filled with fat; area behind shoulder filled with fat; noticeable thickening of the neck; fat deposited along the inner thighs
<b>9</b> Extremely fat	Crease down back; difficult to feel ribs; fat around tailhead very soft; area along withers filled with fat; area behind shoulder filled with fat; noticeable thickening of the neck; fat deposited along the inner thighs