The Weight

BY AMANDA DUCKWORTH

KEEPING A HORSE at its ideal body weight can sometimes be a challenge, but much like the Goldilocks parable, being "just right" leads to the best results. As each horse has different nutritional needs, depending on its stage of life and its activity level, there is no magic formula.

While there can be some trial and error in figuring out a horse's diet, it is imperative to do so. It is intuitive to realize an overly skinny or overly obese horse cannot function at its best, but the consequences from either situation can be worse than owners realize. Visual cues often tell the tale when owners are trying to figure out how to manage the nutritional requirements of their horses.

"You should ensure that your horses maintain optimum body condition and not let them get too fat or too thin, as each presents health risks," explained Dr. Tom Lenz in his paper "Signs of a Healthy Horse" for the American Association of Equine Practitioners. "Use the Henneke Body Condition nine-level scoring system to evaluate your horse's body condition. A body condition score of 4-5 is ideal.

Body weight, condition key to horse's health

"A shiny, glowing coat is a sign of good health that comes from meeting the horse's nutritional requirements and frequent grooming. A dull coat can be a sign of poor nutrition, parasites, or general poor health."

Developed by Dr. Don Henneke, the body condition score (BCS) method has provided a standard technique that can be applied to all breeds since 1983. It assesses accumulated fat both visually and by palpation in each of six areas—the ribs, behind the shoulder, withers, loin, tailhead, and neck.

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A shiny, glowing coat is a sign of good health

Almost four decades later the concept of using a BCS to help determine a horse's wellness remains a go-to in equine assessment although there are other methods that can be used.

Published in the February 2020 edition of the *Journal of Equine Veterinary Science*, the study "Relationships Between Measurements of Body Fat in Thoroughbred Horses" looked at various means of determining body condition.

"Equine obesity is increasing in prevalence, and weight-loss diets are frequently recommended for these horses," explained the study. "However, there are also management situations in which horses are deemed to be too thin. To monitor the efficacy of weight change programs, estimates of body fat are often made.

"There are several systems available to estimate body fat, and there are benefits and challenges to using each method. The objective of this study was to compare four different methods of estimating body fat in Thoroughbred horses."

The relationships among BCS, morphometric measurements, ultrasonic measures of subcutaneous fat depots, and estimation of total body fat distribution (BFD) via measurement of total body water through deuterium oxide dilution were evaluated in 14 Thoroughbreds who ranged from 4.5 to 6.5 on the scale.

"Body condition score, heart girth-to-body weight ratio, and BFD were all positively correlated with each other," the study concluded. "Subcutaneous fat depth at the tailhead tended to be positively related to BFD when only horses with BCS ≥ 5 were included. These data suggest that BCS remains a simple means of monitoring adiposity in mature horses in moderate condition.

"Tailhead fat depots may become useful for monitoring changes in body fat in Thoroughbreds with a BCS above 5, al-

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though more work with animals of higher adiposity is required and at different times of year."

While Thoroughbreds in the midst of their racing careers are likely to be on carefully regimented feeding plans, it is important that they remain at healthy weights in retirement—be it as stallions, broodmares, or pleasure horses.

A study done on the general equine population of Great Britain looked at the growing levels of obesity among equines. Thoroughbreds usually fared better than other breeds, but as one might expect, horses that were not in active competition were more likely to be obese.

"Prevalence of and risk factors for equine obesity in Great Britain based on owner-reported body condition scores" was published in the March 2015 issue of *Equine Veterinary Journal*. For the study 30 veterinary practices randomly selected horse/pony owners to complete a self-administered postal questionnaire, asking owners to estimate BCS.

"Prevalence of obesity was 31.2%," the study found. "Factors associated with increased odds of obesity were breed, ease of maintaining weight, and primary use. Compared to Thoroughbreds, draught-type, cob-type, native, and Welsh breeds were more likely to be obese.

"Animals described as 'good doers' were more likely to be obese than those described as readily maintaining normal weight. Compared to competition animals, animals used for pleasure riding and non-ridden animals were more likely to be obese."

The University of Kentucky's Department of Animal and Food Sciences has published both "Help! My Horse is Too Fat!" and "Help! My Horse is Too Thin!" to assist people looking to correct the issues once they have been identified.

"As we understand more about the impact that obesity and emaciation have on animal health, it is imperative that we strive to keep our horses at an optimum body condition," the team at UK explained. "Horses can perform almost every activity at a BCS of 5. Most athletic horses are kept at a 5, sometimes 6, depending on their discipline. Some equine athletes, such as endurance horses, will have condition scores between 4 and 5. However, keeping broodmares at condition scores below 5 may reduce their reproductive efficiency.

"In addition, horses with condition scores below 5 may lack the fat stores necessary to withstand a cold winter or other stressful situations. On the other hand, horses that have condition scores above 6 may be less exercise tolerant than their trimmer counterparts and very fat horses may put extra stress on bones, joints, and hooves."

When figuring out the right diet for any horse, it is important to remember how important grazing is to its digestive health.

"Horses consume calories from their pasture, hay, and concentrate feed (such as a sweet feed)," explained the UK team. "Most people underestimate the importance of hay and pasture in the horse's diet. If hay and pasture are good quality and abundant, they can contribute the majority of the calories that a horse needs. The fiber in hay and pasture is also important to keep the digestive tract healthy. If a horse receives too little fiber in its diet, it may be less able to digest its other feeds efficiently."

According to the AAEP, a mature horse will eat 2-2.5% of its body weight a day. Nutritionists recommend that at least half of this should be roughage, such as quality hay, for a horse to be in optimal health.

If a horse is in need of a major feeding change, it is important to work with veterinarians and nutritionists to find the safest approach for each individual circumstance.

"Before starting any new nutritional program with a thin horse, it is important the horse be examined by a veterinarian first to make sure there are no

underlying disease conditions," advised the UK team. "A good dental exam also is essential."

For the easy keepers, it is also important to understand that slow and steady is better than rapid weight loss.

"Depending on how fat your horse is, it may take several months to arrive at his target weight and condition score," said the UK team. "A mature horse will lose weight and condition when the number of calories it consumes is less than the number of calories it uses. Therefore, to decrease body condition, the horse must either decrease calorie intake, or increase calorie use (or both). It isn't healthy to starve a horse into weight loss, so a combination of increased calorie use and decreased calorie intake is a good approach."

For broodmares, proper nutrition can mean the difference between a successful foaling year and a bad one. Being too fat or too thin can affect a mare's ability to get pregnant and carry to term, and it can also impact the resulting foal.

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Proper nutrition can mean the difference between a successful foaling year and a bad one

In "Effect of Obesity on the Preovulatory Follicle and Lipid Fingerprint of Equine Oocytes," which was published in the January 2016 issue of *Biology of Reproduction*, the impact on follicles was also examined.

"Obesity is associated with disrupted reproductive cycles in mares, but the impact of obesity on follicles and oocytes has received minimal attention," said the study. "We investigated the impact of obesity on expression of selected genes in follicle cells for carbohydrate metabolism, inflammatory cytokines, lipid homeostasis, endoplasmic reticulum stress, and mitochondrial function; follicular fluid content of metabolic

hormones and metabolites; and lipid fingerprint of oocytes."

Mares with a normal body weight were used as the control when compared to obese mares, and clear differences could be detected.

"Obese had, or tended to have, lower insulin sensitivity and higher insulin and leptin in serum and follicular fluid," the study found.

"Many metabolites differed between control and obese in serum and/or follicular fluid and correlated with BCS and/or insulin sensitivity. Oocytes from control had greater concentrations of lipids consistent with phosphatidylcholines, phosphatidylethanolamines, and sphingomyelins, while lipids consistent with triglycerides tended to be higher in obese.

"These findings suggest that maternal obesity causes alterations in the follicle and oocyte; the extent to which these alterations impact the conceptus and offspring is still to be determined."

Another study, "The effect of mare obesity and endocrine function on foal birthweight in Thoroughbreds," was published in the July 2017 issue of the *Equine Veterinary Journal* and examined reasons that birthweight of Thoroughbred foals might be on the rise. Overly large foals can lead to difficult deliveries, endangering both the mare and her offspring.

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Most people underestimate the importance of hay in a horse's diet

The study used 66 mares from 40 days post-breeding. BCS, weight, and blood samples were obtained every 60 days throughout gestation. Serum/plasma insulin, leptin and triglyceride concentrations, and foal birthweight were recorded.

"Birthweight of Thoroughbred foals has increased in recent years," said the study's findings. "Mare BCS correlated with foal birthweight; obese mares had heavier foals. Significant hyperinsulinaemia was not identified in this population. Increased leptin concentration in early and late gestation was associated with decreased foal birthweight. Further work is required to establish whether leptin concentration in late gestation could predict foal birthweight."

For stallions and geldings, obesity is also a concern. Inactive and overfed horses are more likely to develop back and joint problems as well as equine metabolic syndrome. EMS is a collection of clinical signs that indicate they are at a higher risk for developing laminitis.

The study "Exploring relationships between body condition score, body fat, activity level, and inflammatory biomarkers" was published in the August 2018 issue of the *Journal of Animal Physiology and Animal Nutrition*.

"Obesity is associated with inflammatory disorders in humans, including degenerative joint disease," according to the study. "While obesity is endemic in horses, its relationship to equine degenerative joint disease has not been explored. The current study sought to describe relationships between: body weight, body condition score, lameness grade, total body fat mass and fat percent, age, gender, activity level (AL), synovial fluid (SF), plasma (PL) PGE2, and glycosaminoglycan (GAG) in horses.

"BCS was positively correlated with BW, FM, FP, AL, and PL-PGE2. BW was also significantly positively correlated with PL-PGE2. It is concluded that BCS is significantly correlated with PL-PGE2, due in part to the combined effect of AL and body condition."

In other words, the study found that a horse's body weight, BCS, and body fat percentage and mass appear to be correlated with blood concentrations of PGE, which is a potential joint damage marker.

As more studies are conducted, the scientific findings are backing up practical experience—proper weight and good nutrition lead to healthier, happier, and more productive horses. BH

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