THE IMPORTANCE OF BODY CONDITION SCORING IN DAIRY FARMING: A BRIEF REVIEW

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REVIEW

Abstract
Body Condition Score (BCS) is a management tool that evaluates the nutritional status of cows by assigning scores based on body fat content. The article discusses the relationship between BCS and cow health, reproduction, milk production, and profitability. It highlights the benefits of early detection of health problems, optimal breeding, accurate feeding, and improved milk production. The article also covers various BCS systems and methods of scoring, as well as the challenges and limitations of BCS in practical use. In conclusion, this review article emphasizes the critical role of BCS in managing a healthy and productive dairy cattle herd.

Keywords:

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INTRODUCTION

Body condition scoring (BCS) has been used in animal management for many years. The history of BCS dates back to the early 1900s when researchers began studying the effects of nutrition on livestock. In the 1930s, dairy farmers in the United States started using BCS to assess the body condition of their cows, primarily to determine when they were in the best condition for breeding (Roche et al., 2009).

BCS gained wider recognition in the 1950s, when it was adopted by the United States Department of Agriculture (USDA) as a tool to evaluate the nutritional status of beef cattle. The USDA developed the 1-9 scoring system, with a score of 1 indicating an emaciated animal, and a score of 9 indicating an extremely obese animal. The 1-9 scoring system is still in use today, with slight variations in some regions.

In the 1970s, BCS was also introduced to the dairy industry in Europe, where it gained popularity as a tool for managing dairy cow nutrition. In Europe, a 1-5 scoring system was developed, with a score of 1 indicating a severely undernourished cow, and a score of 5 indicating an obese cow (Roche et al., 2009).

Since then, BCS has become a widely accepted management tool for various animal species, including beef and dairy cattle, sheep, goats, horses, and pigs. BCS has been shown to be a valuable tool for assessing animal health, welfare, and productivity, and has been incorporated into many animal welfare guidelines and programs worldwide (Roche et al., 2009, Roche et al., 2004).

In recent years, the use of BCS has expanded beyond assessing animal nutrition, and has been used in various research studies to investigate the effects of genetics, environment, and management practices on animal health and productivity.

In this regard, the main purpose of this review is to highlight the up to date benefits of BCS assessment for a healthy and productive dairy cattle farm.

BENEFITS OF BCS ASSESSMENT IN A DAIRY FARM

Early detection of health problems

Early detection of health problems is crucial in a dairy cattle farm to ensure animal health and productivity (Tăpăloagă et al., 2017, Tăpăloagă et al., 2018). One effective method for early detection of health problems is through body condition scoring (BCS) assessment. BCS allows farmers to evaluate the nutritional status of their cows by assigning scores based on body fat content, which helps in identifying cows at

Received; Accepted; First published online

risk of developing health problems (Roche et al., 2009).

Low BCS in cows is often associated with several health problems, such as ketosis, mastitis, and reproductive issues. Ketosis is a metabolic disorder that occurs due to negative energy balance, and cows with low BCS are more prone to this condition. Mastitis is an inflammatory disease of the mammary gland that can occur due to various factors, including poor nutrition. Cows with low BCS are more susceptible to mastitis, as they may have weakened immune systems. Reproductive issues, such as infertility, can also occur in cows with low BCS. This is because energy balance is essential for maintaining reproductive functions in cows (Mishra et al., 2016).

By using BCS assessments, farmers can detect cows that are at risk of developing these health problems and take necessary steps to prevent or treat them. If a cow has a low BCS, farmers can provide additional feed to ensure she is receiving enough energy to maintain her health and prevent the onset of health problems (Roche et al., 2009). Another related example can be the sudden weight loss in cows which can be a possible sign for metabolic disorders or infectious diseases.

In addition to early detection of health problems, BCS assessments can also be used to monitor the effectiveness of treatment and management practices. For example, if a cow has been treated for ketosis, regular BCS assessments can help farmers determine if the treatment has been effective in improving her condition. If a cow has been placed on a new feeding regimen, BCS assessments can help farmers determine if the new regimen is providing the cow with adequate nutrition and maintaining her health (Mishra et al., 2016).

Optimal breeding time

The BCS of a cow at the time of breeding can significantly impact her reproductive performance. Cows with a BCS of 3.0-3.5 are considered to be in optimal breeding condition, as they have enough energy reserves to support reproductive functions. Cows with a BCS below 3.0 may experience delayed onset of estrus and decreased conception rates. On the other hand, cows with a BCS above 3.5 may experience reduced fertility due to excessive body fat accumulation, which can lead to metabolic disorders such as ketosis (Mishra et al., 2016).

By providing additional feed to cows with a low BCS, farmers can increase their chances of conceiving and carrying a calf to term. Similarly, by managing the body condition of cows with a high BCS, farmers can prevent metabolic disorders and reduce the risk of fertility problems (Wang et al., 2019).

In addition to BCS assessments, farmers can also use ultrasound or palpation to monitor the reproductive status of cows. However, these methods may not be as effective as BCS assessments in predicting fertility, as they do not take into account the cow's nutritional status. BCS assessments can provide farmers with a more comprehensive understanding of the cow's overall health and her ability to reproduce (Klopčič et al., 2011).

Optimal feeding

Maintaining the right BCS is crucial for optimal feeding in dairy cattle because it impacts a cow's metabolism, milk production, and overall health. Cows with a BCS below 2.5 may have insufficient body fat to support milk production, which can lead to decreased milk yield and poor reproductive performance. Cows with a BCS above 3.5 may be at risk of metabolic disorders such as ketosis, which can have serious health consequences and impact milk production (Domecq et al., 1997).

By regularly assessing BCS, farmers can adjust feed intake to meet the specific nutritional needs of each cow. Cows with a low BCS may require additional feed to maintain their body condition and support milk production. Conversely, cows with a high BCS may require reduced feed intake to prevent excessive body fat accumulation and reduce the risk of metabolic disorders.

BCS assessments can also help farmers determine the appropriate timing for feed changes. For example, if a cow's BCS is declining, farmers may need to increase feed intake to maintain optimal body condition. If a cow's BCS is increasing, farmers may need to reduce feed intake to prevent excessive body fat accumulation.

Furthermore, BCS assessments can help farmers identify cows with specific nutritional needs. For example, cows in late lactation or early gestation may require different types and amounts of feed compared to cows in peak lactation. BCS assessments can help farmers tailor feed intake to meet the specific nutritional needs of each cow, improving overall herd health and productivity.

Milk production

BCS is an indirect measure of body fat reserves, which are essential for energy balance and milk production in dairy cows.

In lactating cows, body fat is used as an energy source to support milk production. Cows with a low BCS have limited body fat reserves and may not have enough energy to support high levels of milk production, leading to decreased milk yield. Conversely, cows with a high BCS have excess body fat, which can interfere with milk production and cause metabolic disorders such as ketosis, leading to decreased milk yield and poor reproductive performance (Mishra et al., 2016).

Optimizing BCS through proper nutrition and management is crucial for maintaining optimal milk production in dairy cows. By monitoring BCS, farmers can adjust feed intake to ensure that cows are receiving the right amount of nutrition to maintain optimal body condition and support milk production. For example, cows in early lactation have higher energy requirements and may require additional feed to support milk production, while cows in mid to late lactation may require less feed (Wang et al., 2019).

BCS assessments can also help farmers identify cows that may be at risk of decreased milk production due to health issues such as metabolic disorders or reproductive problems.

Early identification and treatment of these issues can prevent further decline in milk production and improve overall herd health.
Furthermore, BCS assessments can help farmers plan for optimal breeding management. Cows with a BCS of 3.0 or higher at breeding have a higher likelihood of conceiving and producing healthy calves, leading to improved reproductive performance and milk production in the herd (Wang et al., 2019; Waltner et al., 1993).

BCS ASSOCIATED CHALLENGES IN A DAIRY FARM OPERATION

While body condition scoring (BCS) is a valuable tool for managing the nutritional status and productivity of dairy cows, there are some potential disadvantages to performing BCS in a dairy farm. One disadvantage is that BCS can be subjective, as it relies on visual and tactile assessments of the cow's body condition. This can lead to inconsistencies in scoring between different evaluators or even the same evaluator at different times. Additionally, cows may have different body shapes and fat distribution patterns, which can make it difficult to accurately assess their BCS (Mishra et al., 2016).

Another potential disadvantage of BCS is that it may not always reflect the true nutritional status of the cow. For example, cows that are in the early stages of pregnancy may have a lower BCS due to the energy demands of the developing fetus, even if they are receiving adequate nutrition. Additionally, cows that are experiencing health issues or metabolic disorders may have a lower or higher BCS than expected based on their nutritional intake alone (Mishra et al., 2016).

Finally, BCS alone may not provide a complete picture of the cow's nutritional status. Other factors such as body weight, body condition changes over time, and feed intake should also be considered when assessing the cow's nutritional status. Therefore, it is important to use BCS in conjunction with other measures of cow health and nutrition to ensure that cows are receiving the appropriate amount of nutrition to support optimal milk production and overall herd health.

BCS SYSTEMS USED IN DAIRY CATTLE

There are two main types of body condition scoring (BCS) systems used in dairy cattle: the 5-point scale and the 9-point scale. The 5-point scale is based on the assessment of the cow's transverse processes (bones) along the spine. This involves palpating the cow's back to determine the amount of fat cover over the transverse processes. A score of 1 indicates that the transverse processes are visible and have no fat cover, while a score of 5 indicates that the transverse processes are covered in a thick layer of fat and cannot be felt (Dillon, 2004).

The 9-point scale assesses several areas of the cow's body, including the backbone, loin, and tailhead. This scoring system provides a more detailed assessment of the cow's body fat reserves than the 5-point scale. In the 9-point scale, a score of 1 indicates that the cow is extremely thin and emaciated, while a score of 9 indicates that the cow is extremely obese with excessive fat reserves (Dillon, 2004).

Both scoring systems provide a numerical score that reflects the cow's body fat reserves, with a higher score indicating greater body fat reserves. The use of either system may depend on factors such as regional practices, farm preference, and available resources. However, it is important to note that regardless of the scoring system used, consistency and

accuracy in the assessment of BCS are crucial for proper management of dairy cattle (Dillon, 2004).

In addition to these two primary BCS systems, there are also other variations of BCS used in dairy cattle such as visual assessment, image analysis, and ultrasonography. Visual assessment involves subjective evaluation of the cow's overall body condition, while image analysis uses photographs or video images to assess the amount of body fat in specific areas of the cow's body. Ultrasonography uses ultrasound technology to measure subcutaneous fat thickness and provide an objective assessment of body fat reserves (Dillon, 2004).

Overall, the choice of BCS system will depend on various factors, including the available resources, the specific goals of the farm management, and regional practices. Regardless of the system used, regular and consistent assessment of BCS is critical to ensuring optimal nutrition and health of dairy cattle (Dillon, 2004).

CONCLUSIONS

In conclusion, body condition scoring (BCS) is a valuable tool in the management of dairy cattle. The ability to assess the body fat reserves of dairy cows through BCS allows for the early detection of health issues, optimal feeding practices, and improved milk production. The use of BCS in dairy cattle has several advantages, including its simplicity, low cost, and non-invasive nature. Additionally, it can help reduce the risk of metabolic disorders and improve reproductive efficiency.

However, the implementation of BCS in dairy cattle does come with some challenges. These include the need for accurate and consistent scoring, the need for appropriate training of personnel, and the subjective nature of visual scoring systems. Furthermore, there can be variation in scoring systems between different countries, regions, and even individual farms.

Despite these challenges, the benefits of BCS in dairy cattle management outweigh the challenges. With proper training and consistent implementation, BCS can significantly improve the health and productivity of dairy cows. Future research on BCS systems and their effectiveness in improving the overall management of dairy cattle will continue to refine the use of BCS and increase its value in the dairy industry.

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