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RELATIONSHIP BETWEEN THE BODY CONDITION AND THE APPEARANCE PARAMETERS OF HOLSTEIN-FRIESIAN COWS

EDIT MIKÓ, ÁKOS SZABÓ

University of Szeged, Faculty of Agriculture
Andrássy út 15., 6800 Hódmezővásárhely, Hungary
mikone@mgk.u-szeged.hu

ABSTRACT

The body condition has been part of the livestock judgment in Hungary since 2007. This date can be called relatively late, because in Ireland and Britain body condition scoring has been part of the conformation judging system of Holstein-Friesian cows since 1996. In our study we analysed the mean of linear characteristics within lactations, and compared the results to the ideal values of each characteristic. We also analysed the correlation between body condition and linear type traits. The results of the relationship between the body condition and the linear descriptive characteristics in case of body measurement are weak (r=0.09), or medium (r=0.29) and except for the angularity (between r=-0.39 and r=-0.50) they are positive. When analysing the main functional areas, we also compared the difference among the scores of the lactations. We investigated the relationship between the body condition and the main functional types. Overall we founded that the increase in the number of lactations as well as the improving body condition had a positive effect on the body score. When investigating the relationship between the body condition and the dairy strength a negative correlation was found between these two attributes.

Keywords: body condition scoring system, milk production, energy reserve, nutritional management, reproduction management

INTRODUCTION

The body condition has been part of the livestock judgment in Hungary since 2007. This date can be called relatively late, because in Ireland and Britain body condition scoring has been part of the conformation judging system of Holstein-Friesian cows since 1996 (PRYCE ET AL., 2000). It was in 2004 that the breeders began to be interested in BCS in Hungary, because then the Veepro Company (from Holland) and the Holstein-Friesian Breeders Association (from Hungary) organized a practical training about BCS (BOGNÁR (2004). Then, however the BCS method being part of type classification system was not presented; the Dutch expert showed the practical method of BCS (on a scale of 1-5). In the 26th European Holstein and Red Holstein Conference JONG (2005) demonstrated the benefits of using the BCS system; the method was illustrated on a nine point scale. The body condition scoring system was introduced in eight countries that year.

In Hungary the body condition scoring became part of the classification system in 2007, in accordance with recommendations by ICAR. The problems of dairy herd (reproduction disorders, early disposal) emphasized the importance of relationships between linear type traits and some quality parameters. BERTA (2010) examined the relationship between longevity and linear type traits. Based on their results it seems that the cows that were culled later have a taller rump, a stronger and deeper body, taller real udder height and better udder cleft with a less deep udder than those of the earlier culled animals. According to GÁSPÁRDY ET AL. (1995) the useful lifetime is too short to be influenced by the appearance characteristics (based on the constitution and body solidity). The early culling of cows from the production can be caused by other factors. ROYAL ET AL. (2002) calculated a -0.84 genetic correlation between BCS (at classification) and calving interval. DECHOW ET AL. (2003) analysed a −0.73 genetic correlation between BCS and dairy form,

whereas the genetic correlation between BCS and strength was 0.72. The genetic correlation between body condition score and the final score was rather low (0.08). The correlation between sharpness and body condition was -0.40 given by PRYCE ET AL. (2000). BASTIAN ET AL. (2007) also reported a negative relationship between sharpness and body condition (r = -0.35 r = -0.73.) The contrast between the two parameters can be the result of the improved condition masked the sharpness. KADARMIDEEN AND WEGMANN (2003) searched for significant association between the linear type traits, the main judgement characteristics and the body condition. They analysed the correlation between the body condition and chest width (r=0.17) and between BCS and body capacity (0.19) Body condition score had a negative correlation with dairy strength (-0.35) and udder quality (-0.42). Estimates of correlations between the BCS and final class (0.13) were not significant.

MATERIAL AND METHOD

We analysed the mean of linear characteristics within lactations, and compared the results to the ideal values of each characteristic. We also analysed the correlation between body condition and linear type traits.

The results of the groups were compared to the results within the number of lactations. The correlation examinations were also analysed within the lactation groups. The data were analyzed by the method of variance. The relationship between variables was examined with correlation analysis tests (Pearson's correlation coefficient).

The relationship between the values of different lactation (first, second and third lactations) were investigated by Spearman's rank correlation coefficients.

Table 1. The linear parameters in different lactation (1- 3.)

	Lactation number			Ideal values	r_{rang}	
	1 n=861	2 n=964	3 n=634		1-2	1-3
Stature	6.05^{a}	6.58^{b}	**6.94^{c}**	7-9	0.74**	0.84**
Chest width	5.47^{a}	5.80^{b}	6.15^{c}	9	0.62**	0.81**
Body depth	5.65^{a}	6.14^{b}	6.54^{c}	9	0.59**	0.72**
Angularity	5.80^{a}	5.94^{b}	5.99^{b}	9	0.44**	0.29
Body condition score	4.86^{a}	4.63^{b}	4.53^{c}	5	0.29**	0.50*
Rump angle	5.38^{a}	**5.09^{b}**	**4.93^{c}**	5	0.69**	0.64**
Rump width	5.12^{a}	5.47^{b}	5.81^{c}	8	0.70**	0.61**
Rear legs set	5.78^{a}	5.94^{b}	6.21^{c}	5	0.64**	0.58**
Rear legs rear view	5.46^{a}	5.41^{ab}	5.30^{b}	9	0.65**	0.70**
Locomotion	5.64^{a}	5.62^{a}	5.39^{b}	9	0.71**	0.72**

** P<1%,* P<5%;

The ideal values developed based on the recommendations by the Holstein-Friesian Breeders Association

RESULTS

When examining the appearance parameters (*Table 1*) we tried to find out what effect the body condition has on the descriptive linear characteristics and the main judgement characteristics.

In the results of the descriptive linear characteristics we found differences between the ones with different lactation numbers. The average values of the characteristics are seldom in the ideal interval. The body condition is the most favourable in the first lactation, later it decreases. The results of the rank correlation analysis in the first and second as well as the first and third lactations confirmed a medium or tight correlation. Considering the BCS there is a loose correlation (r_r=0.29) between the first and second lactation, while there is a medium (r_r=0.50) correlation between the first and the third lactation. These results suggest that we cannot predict the further lactation results on the basis of the estimated body condition in the first lactation.The results (*Table 2*) of the relationship between the body condition and the linear descriptive characteristics in case of body measurement are weak (r=0.09), or medium (r=0.29) and except for the angularity (between r=-0.39 and r=-0.50) they are positive. PRYCE ET AL. (2000) also found a negative relationship between body condition and sharpness.

Table 2. Relationship between the body condition and the linear descriptive characteristics

	Lactation number		
	1 n=861	2 n=964	3 n=634
Stature	0.09*	-0.03	-0.03
Chest width	0.29**	0.27**	0.22**
Body depth	0.16**	0.07*	-0.02
Angularity	-0.39**	-0.47**	-0.50**
Rump angle	0.07*	0.10**	0.01
Rump width	0.19**	0.13**	0.05
Rear legs set	-0.27**	-0.17**	-0.29**
Rear legs rear view	0.30**	0.21**	0.28**
Locomotion	0.22**	0.09**	0.11**

** P<1%,* P<5%

The relationship between stature and body condition is not confirmed, the strength shows weak correlation, the value of the correlation coefficient is the largest in the first lactation. KADARMIDEEN AND WEGMANN (2003) also showed a loose correlation (r = 0.17), however DECHOW ET AL. (2003) obtained a tight relationship (r=0.73) between the two parameters.

CONCLUSIONS

The results of our study show that the body condition of the cows can be associated with their other linear descriptive characteristics as well. We found a medium correlation between the first and the third lactation of body condition. The estimated body condition

scores at type-classification can be utilised as valuable information sources because the dairy type can be detected with them. Based on this research the integration of the regular body condition scoring into the technology is especially important. The results of livestock judgement should be evaluated periodically (after the milk recording, when the animals are selected into feeding groups).

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