ACTA SCIENTIARUM POLONORUM *Acta Sci. Pol., Zootechnica 13 (1) 2014, 57–66*

COMPARISON OF BODY CONDITION SCORES IN POLISH HOLSTEIN-FRIESIAN COWS OF BLACK-AND-WHITE VARIETY MANAGED IN DIFFERENT HOUSING SYSTEMS

Piotr Sablik, Paulina Kobak, Anna Skrzypiec, Agata Klenowicz, Daria Derezińska

West Pomeranian University of Technology, Szczecin, Poland

Abstract. The study was conducted in two dairy farms located in the province of Wielkopolska, Poland. Body condition scoring of Holstein-Friesian cows was carried out in spring, summer, autumn, and winter. In all, were carried out 1999 BCS assessments on 459 cows, housed in a free-stall barn, and 88 cows, housed in a tie-stall barn. Statistical analysis involved the housing system (free-stall and tie-stall), the technological status (primiparous and multiparous cows), and the season. The mean BCS of free-stall cows decreased until 100 days in lactation, then it increased again and reached the peak in dry cows, 3 weeks before calving. Primiparous cows had higher BCSs than multiparous cows. The effect of season on BCS in the free-stall system cows was significant ($P \leq 0.01$ and $P \leq 0.05$). BCS was lowest in the autumn. Moreover, technological group had an effect on BCS in the free-stall barn ($P \leq 0.01$ and $P \leq 0.05$); however, housing system was without a significant effect on the mean BCS or its distribution. In the movement restricting tie-stall housing system allows maintaining an optimal BCS by provision well balanced feeding rations.

Key words: dairy cows, Holstein-Friesian cows, body condition assessment, BCS, housing system

INTRODUCTION

The dynamic progress in breeding and husbandry has resulted in an increased milk yield in dairy cattle. This increase is correlated with higher feeding require-

Corresponding author – Adres do korespondencji: Piotr Sablik, PhD, West Pomeranian University of Technology, Szczecin, Department of Ruminant Science, ul. Doktora Judyma 10, 71-466 Szczecin, Poland, e-mail: piotr.sablik@zut.edu.pl

ments of the cows. Hence a higher risk of feeding faults, especially in the perinatal period, when the cows often develop a negative energetic balance. Bad nutrition may result in metabolic diseases such as ketosis, acidosis, hepatic steatosis or calving paralysis. This is why a way to accurately assess cow's energy reserves in different stages of production and in various physiological states is so important.

One of the methods allowing to accurately assess the energetic reserves is Body Condition Scoring. Although it is a subjective assessment method, a correlation has been established between a BCS and the thickness of subcutaneous adipose tissue measured using ultrasonography [Nogalski et al. 2009]. Additionally, BCS is a simple, non-invasive method that does not require any expenses from the breeder [Wildman et al. 1982, Domecq et al. 1995]. Checking the body condition in a dairy herd on a regular basis facilitates the control of proper nutrition, which reduces the risk of metabolic diseases and reproduction problems. It also prevents economic loss resulting from a decrease in milk yield, reproduction disorders, and the costs of veterinary care [Gillund et al. 2001].

A range of studies show the relationship between the body condition of the cow and many other traits. Guliński et al. [1994], Kertz et al. [1997], and Borkowska et al. [1999, 2012] state that cow age has a significant effect on the body condition. Others indicate that the energy reserve level is related to the cows's milk yield [Borkowska 2000, Berry et al. 2003, Mao et al. 2004, Bouška et al. 2008, Jílek et al. 2008] and reproduction parameters [Januś 2003, Adamski and Świerkowski 2004, Jílek et al. 2008]. Some authors confirmed the effect of management system, physiological state, production cycle phase, as well as year season [Kowalski et al. 2003, Jankowska et al. 2012].

The aim of the study was to compare the results of body condition scoring of dairy cows managed in two housing systems (free-stall and tie-stall) with regard to season, age, and the phase of the production cycle.

MATERIAL AND METHODS

The study was conducted on Polish Holstein-Friesian cows, Black-and-White variety, housed in two dairy farms belonging to the same owner, located in the province of Wielkopolska, Poland. Cows in one holding were managed in a free-stall system, whereas cows in the other farm remained in a tie-stall barn. The cows in the latter holding belonged to the following production cycle phase groups:

- Group 1: primiparous cows at 20–100 days in lactation;
- Group 2: cows in the period between calving and 20 days in lactation;
- Group 3: multiparous cows at 20–100 days in lactation;
- Group 4: cows at more than 100 days in lactation;
- Group 7: dry cows, 8 weeks before calving;

– Group 8: dry cows, 3 weeks before calving.

The animals were fed TMR throughout the year. The ration consisted of straw, ensiled sugar-beet pulp, ground grain, maize silage, alfalfa, ground soybean and a mineral-vitamin supplement. The feeding rations were formulated separately for each production group.

In the tie-stall barn there was no division into production groups. The TMR, similarly as in the other farm, consisted of ground soybean, maize silage, ensiled maize grain, and hay. The feeding rations were formulated with regard to body weight and predicted milk yield. Additionally, individual feeding with ground grain was applied in the case of an increased daily milk yield.

The BCS assessment was conducted by two persons, on a standing animal, in good lighting. Visual inspection and palpation in the rump area of the animal focused on the lumbar spine, spinous processes, the hook bones (*tuber coxae*), the pinbones (*tuber ischii*), the line between the hook and the pinbones, and the tailhead. We used 5-point (1.0–5.0 points) scale [Wildman et al. 1982] with 0.25-point increments. Body condition scoring was done in each of the seasons: spring (in April), summer (in August), autumn (in October), and winter (January). In all 1999 assessments were collected (from 88 cows in the tie-stall system and 459 cows in the free-stall housing system).

The obtained results were analysed statistically and means, standard deviations and variation coefficients were calculated for the particular groups with regard to housing system (free-stall, tie-stall), technological group (farm), age of cow (primi- or multiparous), and the season (spring, summer, autumn, winter). The means were then compared using ANOVA for the main effects according to the following formula:

$$Y_{ijkl} = \mu + u_i + t_j + w_k + s_l + e_{ijkl},$$

where:

Y_{ijkl} – phenotypic value of the trait,
μ – mean of the trait,
u_i – housing system,
t_j – technological group,
w_k – cow's age,
s_l – season,
e_{ijkl} – random error.

In order to estimate the distribution of the particular BCS assessments by the factors, there was the nonparametric χ^2 test used. A spreadsheet and the Statistica.pl package were used for calculations.

RESULTS AND DISCUSSION

The lowest mean BCS in the free-stall barn was fund in the second group (up to 20 days in lactation) and in the autumn (Table 1), 2.38 points, whilst the highest was noted in dry cows in the 8th week before calving (group 7) in the spring, 3.33 points. An analysis of temporal changes in BCS values within the technological groups shows a decrease until 100 days in lactation followed by a gradual increase to its peak in dry cows 3 weeks before calving.

Table 1. Mean BCS of cows by technological group and season in the free-stall system

Tabela 1. Średnie wartości kondycji (BCS) u krów w różnych grupach technologicznych i sezonach oceny w utrzymaniu wolnostanowiskowym

Technological group Grupa technologiczna	Statistics Miara statystyczna	Year season – Okres oceny kondycji			
		Summer Lato (VIII)	Autumn Jesień (X)	Winter Zima (I)	Spring Wiosna (IV)
1	Number of cows Liczba krów	124	113	118	115
	Mean	2.66Aa	2.52ABC	2.70B	2.77Ca
	SD	0.30	0.28	0.30	0.32
	V%	11.17	11.27	11.27	11.58
2	Number of cows Liczba krów	45	41	22	45
	Mean	2.55a	2.38Aab	2.60b	2.71A
	SD	0.38	0.36	0.32	0.38
	V%	14.11	15.21	12.16	14.11
3	Number of cows Liczba krów	73	105	110	106
	Mean	2.51	2.49	2.56	2.56
	SD	0.41	0.38	0.33	0.37
	V%	16.4	15.33	12.90	14.44
4	Number of cows Liczba krów	113	99	103	71
	Mean	3.0A	2.73ABC	3.03B	3.10C
	SD	0.48	0.39	0.35	0.37
	V%	16.13	14.13	11.52	11.40
7	Number of cows Liczba krów	16	34	63	30
	Mean	3.16Aa	2.76AB	2.94Ca	3.33BC
	SD	0.49	0.36	0.38	0.34
	V%	15.54	13.16	12.89	10.10
8	Number of cows Liczba krów	25	22	33	23
	Mean	3.23ABa	2.90A	2.88B	3.03a
	SD	0.34	0.41	0.30	0.41
	V%	10.46	14	10.44	13.46

The same upper (lower) case letters denote differences between means in columns significant at $P \leq 0.01$ ($P \leq 0.05$).

Te same wielkie (małe) litery oznaczają istotne różnice między średnimi w kolumnach na poziomie $P \leq 0,01$ ($P \leq 0,05$).

Primiparous cows (group 1) until 100 days in lactation had higher condition scores compared to multiparous cows (group 3) in the same lactation stage. It is beneficial as primiparous cows need large energy to meet their living and production demands but also to allow the somatic development to attain maturity.

In all technological groups, except group 3, an evident effect of season on BCS was noticed. The lowest body condition scores were recorded in the autumn. In groups 1, 2, and 4, the differences in relation to other seasons were significant ($P \leq 0.01$ and $P \leq 0.05$). The highest BCS values were recorded for groups 1–4 in winter and spring, whereas for dry cows in spring and summer.

The housing system did not have a significant effect on the mean BCS (Table 2), apart from the autumn, when the free-stall cows had significantly higher body condition ($P \leq 0.05$) compared to tie-stall cows. In the latter group, no significant effect of season on BCS was confirmed, although – like in free-stall cows – tie-stall cows had the highest condition in spring and the lowest in autumn.

Table 2. Mean BCS of cattle in different year seasons with regard to the housing system

Tabela 2. Średnie wartości kondycji (BCS) u krów w różnych sezonach oceny w zależności od systemu utrzymania

Housing system System utrzymania	Statistics Miara statystyczna	Year season – Okres oceny kondycji			
		Summer Lato (VIII)	Autumn Jesień (X)	Winter Zima (I)	Spring Wiosna (IV)
Free-stall barn Obora wolnostanowiskowa	Number of cows Liczba krów	396	414	449	390
	Mean	2.78A	2.59ABC*	2.78B	2.82C
	SD	0.46	0.38	0.38	0.43
	V%	16.49	14.79	13.57	15.16
Tie-stall barn Obora uwięziowa	Number of cows Liczba krów	80	86	88	86
	Mean	2.71	2.68*	2.74	2.80
	SD	0.49	0.42	0.35	0.39
	V%	18.09	15.78	12.75	14.03

The same letters denote differences between mean values in columns significant at $P \leq 0.01$.
Asterisk (*) denotes differences between means in lines significant at $P \leq 0.05$.
Te same litery oznaczają różnice między wartościami średnimi w kolumnach istotne na poziomie $P \leq 0,01$.
Gwiazdką (*) oznaczono różnice między wartościami średnimi w wierszach istotne na poziomie $P \leq 0,05$.

The BCS in the assessed animals remained within the range 1.5–4.25 in the free-stall system (Table 3) and 1.75–3.75 in the tie-stall system (Table 4). The distribution of BCS in by technological group in the free-stall system varied (Table 3). The largest group after calving and before 20 days in lactation was composed of cows with BCS of 2.25, 2.5, and 2.75 points. A large proportion of these cows (over 20%) had condition of 2.0 points or lower; this could lead to abnormalities in lactation or health problems, as such a condition at the beginning of

lactation is considered too low. Guliński [2006] reports that cow condition at the early lactation should be around 3.0 points. Obese cows can experience a number of problems, including difficult calving, retained placenta, mastitis, ketosis, or calving paralysis. On the other hand, cows entering lactation in poor condition (below 2.5 points) lack energy reserves. In this case the perinatal complications are less common, but further cow's milk production and reproduction will be decreased.

Table 3. BCS distribution by technological group in free-stall system

Tabela 3. Rozkład ocen BCS u krów z podziałem na grupy technologiczne w utrzymaniu wolnostanowiskowym

BCS group Grupy punktowe BCS	Technological group – Grupa technologiczna $\chi^2 = 665$; $P \leq 0.00000$											
	1		2		3		4		7		8	
	n	%	n	%	n	%	n	%	n	%	n	%
1.5	–	–	2	1.31	2	0.51	1	0.26	–	–	–	–
1.75	1	0.21	8	5.23	26	6.60	2	0.52	–	–	–	–
2	15	3.19	23	15.03	57	14.47	11	2.85	7	4.90	–	–
2.25	53	11.30	51	33.33	108	27.41	18	4.66	7	4.90	3	2.91
2.5	160	34.12	29	18.95	94	23.86	53	13.73	16	11.19	19	18.45
2.75	125	26.65	28	18.30	61	15.48	58	15.03	18	12.59	12	11.65
3	86	18.34	10	6.54	29	7.36	114	29.53	46	32.17	33	32.04
3.25	24	5.12	1	0.65	11	2.79	64	16.58	20	13.99	17	16.50
3.5	4	0.85	1	0.65	4	1.02	50	12.95	21	14.69	16	15.53
3.75	–	–	–	–	2	0.51	11	2.85	5	3.50	1	0.97
4	2	0.43	–	–	–	–	3	0.78	3	2.10	1	0.97
4.25	–	–	–	–	–	–	1	0.26	–	–	1	0.97

Table 4. BCS distribution in cattle in the two husbandry system

Tabela 4. Rozkład ocen BCS u krów w dwóch systemach utrzymania

Husbandry system System utrzymania $\chi 2 = 12.65$ $P \leq 0.96$		BCS group Grupy punktowe BCS											
		1.5	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25
Free–stall barn	n	5	37	113	240	371	302	318	137	96	19	9	2
Obora wolnostanowiskowa	%	0.30	2.24	6.86	14.56	22.50	18.31	19.28	8.31	5.82	1.15	0.55	0.12
Tie-stall barn	n	–	3	21	41	80	60	84	29	16	5	–	1
Obora uwięziowa	%	–	0.88	6.18	12.06	23.53	17.65	24.71	8.53	4.71	1.47	–	0.29

The comparison of the condition of primiparous and multiparous cows until 100 days in lactation reveals that in the previous group the most numerous (over 60%) were cows with condition 2.5 and 2.75 points, whereas in the latter – cows with 2.25 and 2.5 points (also over 60%). Lower condition scores were also more common within multiparous cows (over 20%) as compared with primiparous cows (over 3%). Nogalski and Górak [2008] report that primiparous cows with a BCS

of 3.0 to 3.25 had the highest yield of standard energy content milk. The values attained by the studied cows were lower, although our cows had already been in lactation and, according to these authors, the condition of high-yield dairy cows normally decreases in early lactation by 0.5–1.0 points. Waltner et al. [1993] report that the highest milk yield was achieved by cows which on calving had an average amount of adipose tissue. Contreras et al. [2004] claim that cows calving at BCS below 3.0 have a tendency to attain higher milk yields in the early lactation. In the peak lactation, we recorded lowest body condition scores; this is, however, a normal phenomenon, as Domecq et al. [1997] claim, because the high-yield Holstein-Friesian cows have the lowest BCS between 4 and 8 weeks in lactation. As Nogalski [2006] reports, in the first three months of lactation, a cow can lose even 1 kg of body weight per day, and a highly productive cow can lose even 2 kg. However, it is not the overall loss of reserves, but the pace of their mobilisation that is important.

In the subsequent technological group (more than 100 days in lactation) the condition scores were most variable (1.5–4.25 points), being generally higher, with the most frequent 3.0 (nearly 30%), 3.25, and 3.5 points (over 29%). According to Oprządek and Oprządek [2009], cows that are past their peak lactation should stop decreasing in their condition. During that time the energy supplied with feeding rations should exceed the energy demand for milk production and should be used to restore the energy reserves of the organism. Adamski and Onyszko [2000] also claim that balancing the energy of a cow's organism takes place at around 120 days in lactation. According to Guliński [2006], the condition of a high-yield cow at about 180 days in lactation should approximate 3.0 points (3.0 to 3.5 for medium-yield cows).

Dry cows (groups 7 and 8), similarly to the previously mentioned groups, the most common BCS was 3.0 points (over 30%); however, variability in BCS was lower in both groups (single individuals with BCS below 2.5).

χ^2 test showed a significant effect of technological group on the body condition. The significance of the condition value should be considered appropriate. Variability in cow condition in different stages of the production cycle and reproduction phases has been confirmed by numerous authors [Berry et al. 2003, Borkowska et al. 2004, Jílek et al. 2008, Borkowska et al. 2012, Loker et al. 2012].

The comparison of the body condition distribution in relation to housing system (Table 4) revealed no significant differences. In both systems the majority (over 60%) were assessed between 2.5 and 3.0 points of BCS. In the free-stall system there were more cows with extreme BCSs. The results presented in this study confirm those of Kowalski et al. [2003] and Jankowska et al. [2012], who reported that management system does not excert a significant effect on the body condition of dairy cows.

CONCLUSION

Regardless of the housing system, the majority of cows (80%) was evaluated for BCS at 2.5–3.25 points. This implies that nutrition was on a proper level and the rations was well formulated in relation to the lactation phase and the physiological state of the cows. Nevertheless, a small group of cows exhibiting extreme, both high and low BCSs should be taken care of, since such extremes may either indicate an existing disease (emaciated cows) or lead to possible metabolic diseases (obese cows). There was no significant correlation between the management system and the body condition of the cows. In the tie-stall system, where movement is restricted, it is possible to maintain proper body condtition through provision of well balanced feeding rations.

REFERENCES

Adamski M., Onyszko P., 2000. Analiza współzależności kondycji krów czerwono-białych z niektórymi parametrami mleczności i rozrodu [Analysis of the interdependence of Red-and-White cows condition with some parameters of milk production and reproduction]. Zesz. Nauk. Prz. Hod. 51, 85–92. [in Polish].

Adamski M., Świerkowski K., 2004. Analiza współzależności kondycji ciała krów mlecznych z wybranymi parametrami rozrodu [Analysis of the correlation between body condition of dairy cows and chosen parameters of production]. Zesz. Nauk. AR we Wrocławiu, Zootech. LII, 505, 27–33. [in Polish].

Berry D.P., Buckley F., Dillon P., Evans R.D., Rath M., Veerkamp R.F., 2003. Genetic relationships among body condition score, body weight, milk yield, and fertility in dairy cows. J. Dairy Sci. 86 (6), 2193–2204.

Borkowska D., 2000. Kondycja krów mlecznych i jej związek z wydajnością mleka oraz zdrowotnością wymion [The condition of dairy cows and its relationship with milk yield and udder health status]. Ann. UMCS, sec. EE, XVIII, 3, 15–20. [in Polish].

Borkowska D., Januś E., Wilgos A., 2012. The effect of selected factors on changes in bodz condition in high-yield cows. Acta Sci. Pol., Zootechnica 11 (4), 11–20.

Borkowska D., Polski R., Januś E., 2004. Kształtowanie się kondycji i dziennej wydajności mleka w przebiegu laktacji krów w gospodarstwach farmerskich Zamojszczyzny [Development of body condition and daily milk yield in lactation in cows on large dairy farms of Zamojszczyzna]. Zesz. Nauk. Prz. Hod. 74, 33–40. [in Polish].

Borkowska D., Różycka G., Januś E., 1999. Wpływ poziomu produkcji stada, wydajności dobowej, wieku oraz stadium laktacji na kondycję krów z gospodarstw sektora publicznego [Effect of the level of herd performance, daily yield, age and stage of lactation on the condition of cows from state farms]. Zesz. Nauk. Prz. Hod. 44, 69–72 [in Polish].

Bouška J., Štipková M., Pytloun P., Pytloun J., Kubešová M., 2008. Relationships among body condition score, milk yield and sires' breeding value for beef production efficiency in Czech Fleckvieh cattle. Czech J. Anim. Sci. 53 (11), 453–461.

Contreras L.L., Ryan C.M., Overton T.R., 2004. Effects of dry cow grouping strategy and prepartum body condition score on performance and health of transition dairy cows. J. Dairy Sci. 87, 517–523.

Domecq J.J., Skodmore A.L., Lloyd J.W., Kaneene J.B., 1995. Validation of body score with ultrasound measurements of subcutaneous fat of dairy cows. J. Dairy Sci. 78, 2308–2313.

Domecq J.J., Skodmore A.L., Lloyd J.W., Kaneene J.B., 1997. Relationship between body condition scores and milk yield in a large dairy herd of high yielding Holstein cows. J. Dairy Sci. 80, 101–112.

Gillund P., Reksen O., Gröhn Y.T., Karlberg K., 2001. Body condition related to ketosis and Reproductive performance in Norwegian dairy cows. J. Dairy Sci. 84, 1390–1396.

Guliński P., 2006. Praktyczne wykorzystanie oceny kondycji krów mlecznych [Practical use of body condition evaluation in dairy cows]. Bydło 12, 20–22. [in Polish].

Guliński P., Litwińczuk Z., Młynek K., Niedziałek G., 1994. Ocena kondycji krów utrzymywanych w indywidualnych gospodarstwach województwa siedleckiego [Evaluation of body condition of cows from private farms of Siedlce district]. Zesz. Nauk. Prz. Hod. 14, 289–295. [in Polish].

Jankowska M., Sawa A., Gierszewski R., 2012. Wpływ wybranych czynników na kondycję krów i jej związek ze wskaźnikami płodności [Effect of some factors on cow's body condition and fertility]. Rocz. Nauk. PTZ 8 (2), 9–16 [in Polish].

Januś E., 2003. Zależność pomiędzy kondycją krów a wybranymi wskaźnikami płodności [Relationship between body condition and selected indices of fertility in cows]. Zesz. Nauk. Prz. Hod. 69, 117–121. [in Polish].

Jílek F., Pytloun P., Kubešová M., Štípková M., Bouška J., Volek J., Frelich J., Rajmon R., 2008. Relationships among body condition score, milk yield and reproduction in Czech Fleckvieh cows. Czech J. Anim. Sci. 53 (9), 357–367.

Kertz A.F., Reutzel L.F., Barton B.A., Ely R.L., 1997. Body weight, body condition score, and wither height of prepartum Holstein cows and birth weight and sex of calves by parity: A database and summary. J. Dairy Sci. 80, 525–529.

Kowalski Z.M., Lach Z., Fastyn T., 2003. Wpływ systemu utrzymania na kondycję, zdrowotność i wskaźniki rozrodu krów mlecznych [Effect of housing system on the body condition, health, and reproductive parameters in dairy cows]. Rocz. Nauk. Zootech., Supl. 17, 731–734. [in Polish].

Loker S., Bastin C., Miglior F., Sewalem A., Schaeffer L.R., Jamrozik J., Ali A., Osborne V., 2012. Genetic and environmental relationships between body condition score and milk production traits in Canadian Holsteins. J. Dairy Sci. 95 (1), 410–419.

Mao I.L., Słoniewski K., Madsen P., Jensen J., 2004. Changes in body condition score and its genetic variation during lactation. Lives. Prod. Sci. 89 (1), 55–65.

Nogalski Z., 2006. Optymalna kondycja krów mlecznych [Optimal body condition in dairy cows]. Hod. Bydła, 24–25. [in Polish].

Nogalski Z., Górak E., 2008. Kondycja jałówek przy wycieleniu i jej zmiany w początkowym okresie laktacji a użytkowość pierwiastek [Condition of heifers at calving and its changes at an early stage of lactation vs performance of first-calf heifers]. Med. Weter. 64 (3), 322–326. [in Polish].

Nogalski Z., Łoniewska K., Ambroziak K., Jagłowska B., 2009. Szacowanie poziomu zapasów energetycznych u krów mlecznych na podstawie grubości tłuszczu podskór-

nego [Evaluation of energy reserves in dairy cows based on subcutaneous fat thickness]. Acta Sci. Pol. Zootechnica 8 (1–2), 31–40. [in Polish].
Oprządek J., Oprządek A., 2006. Kondycja ciała krów mlecznych w czasie laktacji i zasuszenia [Dairy cows body conditions in lactation and dry period]. Hod. Bydła 9, 40–42. [in Polish].
Waltner S.S., Mc Namara J.P., Hillers J.K., 1993. Relationships of body condition score to production variables in high producting holstein dairy cattle. J. Dairy Sci. 76, 3410––3419.
Wildman E.E., Jones G.M., Wagner P.E., Bowman R.L., 1982. A dairy cow body condition scoring system and its relationship to selected production characteristics. J. Dairy Sci. 65, 495–502.

PORÓWNANIE KONDYCJI OCENIANEJ METODĄ BODY CONDITION SCORE U KRÓW RASY POLSKIEJ HOLSZTYŃSKO-FRYZYJSKIEJ ODMIANY CZARNO-BIAŁEJ W RÓŻNYCH SYSTEMACH UTRZYMANIA

Streszczenie. Badania przeprowadzono w dwóch gospodarstwach położonych na terenie województwa wielkopolskiego. Skład dawki pokarmowej dla krów w obu gospodarstwach był zbliżony. Badanie kondycji przeprowadzono u krów rasy holsztyńsko-fryzyjskiej według metody Body Condition Score w 4 sezonach: wiosennym – kwiecień, letnim – sierpień, jesiennym – październik i zimowym – styczeń, ogółem wykonano 1999 ocen. Ocenie poddano 459 krów w oborze wolnostanowiskowej i 88 krów w oborze uwięziowej. W opracowaniu statystycznym uwzględniono system utrzymania (wolnostanowiskowy i uwięziowy), rodzaj grupy technologicznej, wiek krów (pierwiastki i wieloródki) oraz sezon oceny. Średnia wartość kondycji u krów w wolnostanowiskowym utrzymaniu zmniejszała się do 100 dnia laktacji, a następnie wzrastała i była najwyższa u krów zasuszonych na 3 tygodnie przed wycieleniem. Krowy pierwiastki miały wyższą kondycję w porównaniu do wieloródek. Stwierdzono wpływ ($P \leq 0{,}01$ i $P \leq 0{,}05$) sezonu oceny kondycji na jej przeciętną wartość w wolnostanowiskowym utrzymaniu krów. Najsłabszą kondycję uzyskały krowy w okresie jesiennej oceny. Wykazano wpływ ($P \leq 0{,}01$ i $P \leq 0{,}05$) grupy technologicznej na kondycję krów w wolnostanowiskowym utrzymaniu. System utrzymania nie wpłynął zasadniczo na średnie wartości oraz na rozkład kondycji. W uwięziowym systemie utrzymania, w którym jest ograniczony ruch, przy odpowiednio zbilansowanej dawce pokarmowej można uzyskać prawidłowe wartości kondycji u krów.

Słowa kluczowe: krowy mleczne, rasa holsztyńsko-fryzyjska, ocena kondycji, BCS, system utrzymania

Accepted for print – Zaakceptowano do druku: 22.04.2014