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THE EFFECT OF DRY PERIOD LENGTH ON MILK PERFORMANCE TRAITS OF BLACK-AND-WHITE POLISH HOLSTEIN-FRIESIAN AND JERSEY COWS

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Abstract

The aim of the study was to investigate the effect of dry period length on milk performance traits of Black-and-White Polish Holstein-Friesian and Jersey cows kept under identical environmental conditions. It was shown that the length of the dry period had a highly significant effect on milk yield in Black-and-White Polish Holstein-Friesian cows with a ≤87.5% proportion of HF genes in their genotype and a significant effect in animals of the same breed, but with a higher proportion of HF genes in their genotype (>87.5%). In case of Jersey cows no statistically significant relationships were found between the length of the dry period and values of analysed milk performance traits. In cows of the Black-and-White Polish Holstein-Friesian breed the most advantageous lengths of the dry period in terms of milk yield in the standard 305-day lactation were 57 – 63 days (for cows with a lower proportion of HF genes – ≤87.5%) and 64–70 days (for >87.5% HF), while the least advantageous was the period lasting for 42 days. Statistical analysis showed that the length of the dry period has a highly significant effect on the number of milking days and yield of fat in cows of the Black-and-White Polish Holstein-Friesian breed with ≤87.5% of HF genes in their genotype and on protein content in milk of cows with both genotypes in this breed. A significant relationship was found between the length of the dry period and yield of protein as well as fat content in milk of Black-and-White Polish Holstein-Friesian cows with >87.5% of HF genes. In case of Jersey cows no statistically significant relationships were found between the length of the dry period and values of analysed milk performance traits. The highest milk yield during lactation was recorded for cows of the Black-and-White Polish Holstein-Friesian breed with >87.5% of HF genes in their genotype. Jersey cows, irrespective of the length of the dry period, exhibited the lowest milk performance differing highly significantly from both genotypes of Black-and-White Polish Holstein-Friesian cows. The highest contents of fat, protein and total solids in milk were found in milk coming from Jersey cows.

Key words: cows, dry period, Polish Holstein-Friesian, Jersey

One of the important physiological periods determining health, milk yield and fertility of cows is the dry period, which lasts from the completion of lactation to calving.

During the production cycle before the expected calving a period of rest is needed and in that time milking is ceased and thus the production of milk in the udder stops. The dry period is required for the regeneration of the mammary gland and its preparation for lactation, during that time papillae of the rumen and the small intestine are regenerated, and the organism of the cow prepares for an increased nutrient requirement of the mammary gland during lactogenesis (Capuco et al., 1997; Annen et al., 2004). We also need to take into consideration the intensive growth of the fetus during that period.

Cows reach increasingly higher milk yields and this suggests the need to investigate the length of the dry period, since it is considerably connected with the profitability of production. The 60-day dry period, used to date, was adopted in the early 1900s and since then the principle "one calf a year" has been applied, which for a 305-day lactation gives 60 days of rest. It was found that its elimination or reduction may have an effect on reduced yield while improving fat and protein contents (Rémond et al., 1997; Andersen et al., 2005). According to Stockdale (2006) shortening or eliminating the dry period may result in a lower incidence of metabolic problems postpartum, and a reduced negative energy balance in early lactation due to the maintenance of dietary intake while milk yields and body condition loss are reduced.

An interesting issue is to determine the optimal length of the dry period, which promotes advantageous productivity of dairy cows. These premises encouraged the authors to undertake this investigation.

The aim of this study was to investigate the effect of the length of the dry period on milk performance traits in Black-and-White Polish Holstein-Friesian and Jersey cows, kept under identical environmental conditions.

Material and methods

The experimental material for the study consisted of a population of 998 cows (512 head of Black-and-White Polish Holstein-Friesian cows and 486 Jersey cows) kept from 1 January 2000 to 31 December 2007 at the Iwno Stud Farm Ltd.

Cows were kept in the stanchion barn system in litter stalls. The feeding system was based on monodiet. The ration contained the following feeds: maize silage, sugar beet pulp, alfalfa haylage, hay or straw, crushed maize meal and concentrate.

Data on animals were collected from breeding records of the farm and official performance testing documentation of dairy cattle. Experimental animals were in their second to tenth lactation.

The following information was recorded for individual cows: the dates of the dry period and calving, the number of milking days, yields of milk, fat, protein and total solids as well as contents of fat, protein and total solids in milk in the standard 305-day lactation. From the collected data the following parameters were calculated for individual animals: milk yield at 100 days of lactation (assuming that it amounted to 43% of a 305-day lactation), the length of the dry period, milk yield expressed in terms of FCM (FCM = 0.4 × kg milk + 15 × kg fat) and the protein:fat ratio.

In terms of genotype, the population of cows was divided into three groups:

– PHF1 – Black-and-White Polish Holstein-Friesian cows with ≤87.5% of HF genes in their genotype (288 head),

– PHF2 – Black-and-White Polish Holstein-Friesian cows with >87.5% of HF genes in their genotype (224 head),

– J – Jersey cows (486 head).

In terms of length of the dry period the following intervals were distinguished (in days):

– ≤42,
– 43–49,
– 50–56,
– 57–63,
– 64–70,
– 71–77,
– >77.

In this study the effect of length of the dry period was analysed (taking into consideration the genotype of cows) on the following parameters: milk yield in a 100-day lactation, a 305-day lactation and expressed in terms of FCM, as well as the protein to fat ratio in milk. Moreover, relationships between the dry period, and the yields and contents of fat, protein and total solids in milk were analysed in this study.

In the statistical analyses the procedures of the SAS® (2007) statistical package were used: MEANS for means and standard deviations, and GLM for the analysis of variance. A detailed comparison of means was conducted using the LSD (least significant difference) test. In the calculations the effect of the following fixed effects was included: the year of the study, the season, lactation rank, genotype, herd, and age at first calving.

Results

Table 1 presents results concerning the effect of the length of the dry period on milk yield in the Black-and-White Polish Holstein-Friesian and Jersey breeds in a 100-day lactation. Statistical analysis showed that the length of the dry period had a highly significant effect on milk yield in a 100-day lactation of Black-and-White Polish Holstein-Friesian cows with ≤87.5% of HF genes in their genotype (PHF1) and a significant effect in animals of the same breed, but with a lower proportion of HF genes in their genotype (PHF2). In case of Jersey cows no statistically significant relationship was observed between the length of the dry period and milk production at 100 days of lactation. When comparing milk yield in a 100-day lactation for cows with an identical length of the dry period, but of different genotypes it was shown that animals with the PHF2 genotype were characterized by the highest productivity, with animals with the PHF1 genotype ranking second. It was found that animals with the PHF2 genotype coming from all variants of dry period length differed from Jersey

cows in terms of milk yield at day 100 of lactation at the significance level of P≤0.01. When comparing animals within the Black-and-White Polish Holstein-Friesian breed it was shown that cows with dry period lengths of 43–49, 50–56 and 64–70 days differed in their milk production at 100 days of lactation. In cows with genotypes PHF2 and PHF1 the most advantageous lengths of the dry period in terms of milk yield at 100 days of lactation were 64–70 and 57–63 days. Black-and-White Polish Holstein-Friesian cows, irrespective of the proportion of HF genes in their genotype, were characterized by the lowest milk yield at 100 days of lactation with the dry period length ≤42 days.

Table 2 contains results of analyses of the effect of the dry period length on selected parameters of milk performance of Polish Holstein-Friesian and Jersey cows. Statistical analysis showed that the length of the dry period has a highly significant effect on the number of milking days, yields of milk and fat in PHF1 cows and protein content in milk of cows with both genotypes of the Black-and-White Polish Holstein-Friesian breed. Moreover, a significant relationship was found between the length of the dry period and yields of milk and fat content in milk of cows with genotype PHF2. In case of Jersey cows no statistically significant relationships were observed between the length of the dry period and values of analysed milk performance traits.

When comparing the number of milking days within genotypes of cows, the lowest value of this parameter, irrespective of the length variant of the dry period, was recorded for Jersey cows. Means calculated for this trait, except for two groups of cows with dry period lengths of ≤42 and >70 days, differed highly significantly and significantly in terms of the number of milking days for Black-and-White Polish Holstein-Friesian cows. When analysing the population of PHF1 and PHF2 cows it was shown that the number of milking days was similar when the length of the dry period was taken into consideration. In case of the PHF1 genotype no consistent trend connected with a change in the number of milking days was found in terms of the varied length of the dry period.

The highest milk yield during lactation in all ranges of the dry period length was recorded for cows with genotype PHF2. In three classes of the dry period (43–49, 50–56 and 64–70 days) animals with genotype PHF2 differed from those with the PHF1 genotype in terms of milk yield at the level of significance P≤0.01. Jersey cows, irrespective of the length of their dry period, were characterized by the lowest milk production, differing highly significantly from cows with both genotypes of the Black-and-White Polish Holstein-Friesian breed. When analysing yields of fat and protein in milk the most advantageous values for these milk performance traits were recorded for cows with genotype PHF2. Cows from this genetic group, representing all classes of the dry period, differed at the significance level of P≤0.01 in terms of yields of fat and protein from Jersey cows and for most ranges of the dry period length – from animals with genotype PHF1. Within genotype PHF1 the highest yields of fat and protein were found for animals with the dry periods of >77 and 57–63 days. In the population of animals with genotype PHF1 we may observe a certain upward trend for the production of fat and protein with an increase in the number of days of the dry period.

Table 1. The effect of dry period length on milk yield at 100 days of lactation in Black-and-White Polish Holstein-Friesian and Jersey cows

Traits	Geno-type	Significance of effect of dry period length	Length of dry period (days)																				
			≤42			43–49			50–56			57–63			64–70			71–77			>77		
			N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
Milk (kg)	PHF1	**	20	2725 A	752	18	3144 AB	529	56	3270 AB	659	131	3463 A	593	114	3412 AB	589	43	3345 A	491	120	3341 A	604
	PHF2	*	15	3037 B	735	15	3619 AC	281	48	3565 AC	510	70	3481 B	647	54	3664 AC	580	32	3549 B	679	52	3407 B	633
	J	NS	99	2163 AB	349	80	2294 BC	382	105	2236 BC	357	152	2235 AB	326	147	2249 BC	349	81	2193 AB	402	99	2216 AB	363

** – highly significant (P≤0.01), * – significant (P≤0.05).
NS – non-significant.
A comparison of cows' genotypes – means denoted with identical letters differ statistically: A, B, C – highly significantly (P≤0.01), a, b ,c – significantly (P≤0.05).

Table 2. The effect of dry period length on selected milk performance traits

Traits	Geno-type	Signifi-cance of effect of dry period length	Length of dry								
			≤42			43–49			50–56		
			N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
Milking days	PHF1	**	20	285 A	25	18	302 a	12	56	299 a	18
	PHF2	NS	15	302 Aa	6	15	302 b	9	48	300 A	17
	J	NS	99	292 a	17	80	294 ab	15	105	293 Aa	15
Milk (kg)	PHF1	**	20	6336 A	1748	18	7312 AB	1229	56	7604 AB	1533
	PHF2	*	15	7063 B	1708	15	8417 AC	653	48	8291 AC	1186
	J	NS	99	5030 AB	812	80	5334 BC	887	105	5199 BC	830
Fat (kg)	PHF1	**	20	317 a	81	18	353 A	72	56	359 AB	86
	PHF2	NS	15	349 Aa	76	15	383 B	55	48	392 AC	72
	J	NS	99	284 A	52	80	291 AB	45	105	291 BC	43
Fat (%)	PHF1	NS	20	5.07 A	0.69	18	4.82 A	0.55	56	4.73 A	0.64
	PHF2	*	15	4.98 B	0.41	15	4.54 B	0.56	48	4.73 B	0.58
	J	NS	99	5.64 AB	0.58	80	5.49 AB	0.56	105	5.64 AB	0.52
Protein (kg)	PHF1	*	20	229 A	50	18	244 AB	37	56	248 AB	44
	PHF2	NS	15	251 B	44	15	276 AC	25	48	270 AC	34
	J	NS	99	201 AB	32	80	208 BC	32	105	205 BC	30
Protein (%)	PHF1	**	20	3.66 A	0.47	18	3.36 A	0.213	56	3.29 A	0.26
	PHF2	**	15	3.61 B	0.31	15	3.28 B	0.17	48	3.24 B	0.19
	J	NS	99	4.01 AB	0.25	80	3.92 AB	0.23	105	3.95 AB	0.21

** – highly significant (P≤0.01); * – significant (P≤0.05); NS – non-significant (P>0.05).
Comparison of cow genotypes – means denoted with identical letters differ statistically: A, B, C – highly significantly

of Polish Holstein-Friesian and Jersey cows. Part I

period (days)												
	57–63			64–70			71–77			>77		
	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
131	301 A	12	114	299 A	16	43	301 Aa	12	120	299 Aa	15	
70	300 B	13	54	300 B	19	32	293 a	22	52	292 a	26	
152	292 AB	16	147	292 AB	16	81	291 A	18	99	290 A	17	
131	8054 A	1379	114	7935 AB	1371	43	7779 A	1143	120	7771 A	1404	
70	8095 B	1504	54	8521 AC	1350	32	8253 B	1579	52	7924 B	1471	
152	5197 AB	758	147	5231 BC	811	81	5101 AB	934	99	5154 AB	843	
131	387 A	90	114	384 Aa	87	43	385 A	83	120	390 A	90	
70	386 B	91	54	412 Ba	89	32	412 B	99	52	395 B	83	
152	293 AB	45	147	293 AB	43	81	287 AB	46	99	287 AB	48	
131	4.79 A	0.67	114	4.82 A	0.67	43	4.94 A	0.68	120	5.01 A	0.68	
70	4.75 B	0.59	54	4.81 B	0.60	32	4.97 B	0.53	52	4.99 B	0.55	
152	5.66 AB	0.578	147	5.63 AB	0.55	81	5.66 AB	0.52	99	5.59 AB	0.54	
131	262 A	42	114	260 A	44	43	255 A	36	120	254 A	43	
70	262 B	48	54	272 B	44	32	263 B	50	52	256 B	47	
152	205 AB	29	147	207 AB	31	81	200 AB	36	99	203 AB	33	
131	3.25 A	0.21	114	3.29 Aa	0.23	43	3.29 A	0.19	120	3.28 A	0.22	
70	3.24 B	0.21	54	3.20 Ba	0.18	32	3.21 B	0.30	52	3.24 B	0.21	
152	3.95 AB	0.22	147	3.96 AB	0.22	81	3.94 AB	0.24	99	3.94 AB	0.23	

(P≤0.01); a, b, c – significantly (P≤0.05).

Table 3. The effect of dry period length on selected milk performance

Traits	Geno-type	Signifi-cance of effect of dry period length	Length of dry								
			≤42			43–49			50–56		
			N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
Milk solids (kg)	PHF1	**	11	968 A	198	5	945 AB	69	30	1056 A	259
	PHF2	*	9	940 B	191	9	1168 AC	109	35	1133 B	146
	J	NS	58	794 AB	117	62	805 BC	113	54	825 AB	109
Dry matter (%)	PHF1	*	11	14.41 A	0.79	5	13.80 A	0.47	30	13.63 A	0.86
	PHF2	NS	9	13.99 B	0.61	9	13.33 B	0.69	35	13.42 B	0.64
	J	NS	58	14.99 AB	0.64	62	14.68 AB	0.60	54	14.86 AB	0.58
FCM	PHF1	**	20	7291 A	1863	18	8220 A	1512	56	8433 AB	1826
	PHF2	NS	15	8066 B	1798	15	9105 AB	991	48	9199 AC	1475
	J	NS	99	6267 AB	1074	80	6498 AB	977	105	6452 BC	933
Protein/fat ratio	PHF1	*	20	0.7	0.06	18	0.71	0.09	56	0.71	0.09
	PHF2	**	15	0.73	0.06	15	0.73	0.1	48	0.70	0.11
	J	NS	99	0.71	0.06	80	0.72	0.06	105	0.70	0.05

** – highly significant (P≤0.01); * – significant (P≤0.05); NS – non-significant (P>0.05).
Comparison of cow genotypes – means denoted with identical letters differ statistically: A, B, C – highly significantly

traits of Polish Holstein-Friesian and Jersey cows. Part II

period (days)												
	57–63			64–70			71–77			>77		
	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
	64	1169 AB	149	61	1113 A	195	25	1097 A	197	50	1079 A	218
	43	1085 AC	180	32	1162 B	214	23	1124 B	248	31	1055 B	201
	72	825 BC	98	76	815 AB	113	41	806 AB	124	60	807 AB	110
	64	13.55 A	0.71	61	13.61 A	0.73	25	13.77 A	0.74	50	13.77 A	0.83
	43	13.31 B	0.59	32	13.42 B	0.72	23	13.50 B	0.63	31	13.60 B	0.63
	72	14.83 AB	0.63	76	14.77 AB	0.55	41	14.82 AB	0.56	60	14.89 AB	0.71
	131	9026 A	1803	114	8928 AB	1773	43	8890 A	1614	120	8961 A	1815
	70	9024 B	1897	54	9582 AC	1814	32	9481 B	2070	52	9091 B	1776
	152	6472 AB	934	147	6486 BC	922	81	6339 AB	1022	99	6368 AB	1018
	131	0.69	0.10	114	0.69	0.09	43	0.68	0.09	120	0.67	0.09
	70	0.70	0.10	54	0.67 A	0.08	32	0.65 A	0.08	52	0.66 A	0.08
	152	0.70	0.06	147	0.71 A	0.06	81	0.70 A	0.05	99	0.71 A	0.06

($P \leq 0.01$); a, b, c – significantly ($P \leq 0.05$).

The highest contents of fat and protein in milk were recorded for Jersey cows, which differed highly significantly in terms of these milk performance traits from the other genotypes of Black-and-White Polish Holstein-Friesian cows. Among the latter the most advantageous results concerning contents of fat and protein in milk were recorded for animals with the shortest dry period (≤42 days).

Table 3 presents results concerning the effect of the dry period length on successive milk performance traits. It was shown that the dry period highly significantly affected the yield of total solids and FCM (PHF1) and the protein:fat ratio (PHF2). In turn, a significant relationship was found for the yield of total solids (PHF2), and total solids content in milk and the protein:fat ratio (PHF1). Statistical analysis showed that in Jersey cows there is no significant effect of the length of the dry period on the yield and content of total solids in milk, or the yield of FCM and the protein:fat ratio in milk.

A higher yield of total solids, confirmed statistically at the level of significance $P \leq 0.01$, was recorded for milk produced by Black-and-White Polish Holstein-Friesian cows in comparison to milk coming from Jersey cows. The highest yield of milk solids (1169 kg) was found for animals with the PHF1 genotype with the dry period ranging from 57 to 63 days. A similar yield of total solids (1168 kg) was also produced by cows with genotype PHF2, but during a shorter dry period (43–49 days). In both these cases means calculated for this trait differed from their equivalents for the other group of Black-and-White Polish Holstein-Friesian cows at the significance level of $P \leq 0.01$. No trend differentiating the value of this parameter with changes in the length of the dry period was observed; however, we need to stress here that the poorest results were found for cows with the shortest dry period (≤42 days).

When analysing total solids content in milk, the highest value of this trait – irrespective of the class of the dry period – was recorded for Jersey cows. Milk produced by this breed in comparison to that obtained from PHF1 and PHF2 cows, contained highly significantly more solids. Neither group of the Black-and-White Polish Holstein-Friesian cows differed statistically in terms of total solids content in milk.

Cows with genotype PHF2 with all ranges of the dry period length except for one (64–70 days) were characterized by the highest yield of 4% fat corrected milk (FCM) in comparison to the other genotypes of animals. Cows with genotype PHF2 in terms of the FCM yield differed highly significantly from Jersey cows. In turn, when comparing both genotypes of Polish Holstein-Friesian cows only three highly significant differences were found. Animals came from the following classes of the dry period: 43–49, 50–56 and 64–70 days. Within the population of cows with genotype PHF1 the yield of 4% fat corrected milk was found to increase with an increase in the number of days of the dry period, with this trend being observed only for the dry periods of 63 days at most.

When analysing the protein:fat ratio in milk it was found that significant relationships for this trait occurred only in cows with a longer dry period (>63 days). In the last three ranges of the dry period the most advantageous values of the protein:fat ratio were recorded for Jersey cows. Animals of this breed in comparison to PHF2 cows differed in their protein:fat ratio in milk at the significance level of $P \leq 0.01$.

Discussion

This study showed that the most unfavourable values of the analysed milk performance traits were found in the group of cows with the short dry period (≤42 days).

Some reports indicate that a dry period lasting for only 30 days may be advantageous for the mammary gland and it has no negative effect on milk yield and composition or udder health. Moreover, higher feed consumption may be expected after parturition, and thus also a reduction of condition loss, reduced frequency of metabolic diseases and improved reproduction indexes and udder health. Some researchers are of the opinion that the main purpose of shortening or elimination of the dry period is to reduce the risk of diseases in the periparturient period (ketosis, swollen udders) and an increased protein content in milk, or to improve the protein:fat ratio without increased outlays on the growing consumption of concentrates. However, Winnicki et al. (2009) showed that the length of the dry period below 30 day has an influence on reducing milk yield and milk quality. Sørensen and Enevoldsen (1991) were of the opinion that increasing the dry period length increases milk production in subsequent lactation. Several studies indicated complete elimination of the dry period results in a 20 to 25% decrease in milk yield the following lactation (Grummer and Rastani, 2004).

In a study by Borkowska et al. (2006) it was shown that a too short dry period (up to 21 days) was connected with the lowest yield of milk, fat and protein in the standard lactation. However, this milk was richest in both fat and protein. Similar results were obtained in this study, in which the highest yields of milk, fat and protein, irrespective of the length of the dry period, were recorded for Polish Holstein-Friesian cows with a lower proportion of HF genes in their genotype. In the population of cows with a higher proportion of genes of this breed we may observe an upward trend for the production of fat and protein, which increase with the elongation of the dry period. In turn, for fat and protein contents in milk the most advantageous dry period length was the shortest variant, of 42 days. Węglarzy (2009) reported similar results to those obtained in this study. This author showed that the most advantageous length of the dry period in terms of milk yield of cows was the interval of 61 to 90 days. Kuhn et al. (2005) showed that milk yield in the subsequent lactations was generally maximized with a 60- to 65-day dry period, regardless of parity. But dry periods shorter than 20 days result in very pronounced losses in subsequent lactation yield. Andersen et al. (2005), when comparing two groups of cows – one without a dry period and the other with a 7-week dry period, stated that animals which were allowed to rest from production were characterized by 22% higher milk yield. It was also shown that in the group of cows without a dry period and producing >45 kg milk a day a considerable drop in milk performance occurred in early lactation. An increase in yields of milk and protein and a decrease in milk fat content with an elongation of the dry period were recorded by Degaris et al. (2008). In turn, Gulay et al. (2003) reported that a 30-day dry period did not have an effect on milk production of cows and it may be used as a tool in the management of a dairy herd. Similarly, Contreras et al. (2004) were of the opinion that 21-day dry periods in comparison to 60 days did not affect milk yield, and cows given a shorter dry period tend to produce more butterfat.

Pezeshki et al. (2007) showed that a 35-day dry period in cows in relation to a 56-day period may be advantageous in cows with excessive body condition.

In conclusion, statistical analysis showed that the length of the dry period has a highly significant effect on the number of milking days, yields of milk and fat in Black-and-White Polish Holstein-Friesian cows with the lower proportion of HF genes in their genotype (≤87.5%) and protein content in milk of cows with both genotypes of this breed. A significant correlation was found between the length of the dry period, and yields of milk and protein as well as butterfat content in milk of Black-and-White Polish Holstein-Friesian cows with a higher proportion of HF genes (>87.5%). The highest milk yield during lactation, irrespective of the length of the dry period, was found for Black-and-White Polish Holstein-Friesian cows with >87.5% of HF genes in their genotype. In cows of the Black-and-White Polish Holstein-Friesian breed the most advantageous lengths of the dry period in terms of milk yield in the standard 305-day lactation were 57–63 days (for cows with a lower proportion of HF genes – ≤87.5%) and 64–70 days (for >87.5% HF genotype), while the worst was a period of ≤42 days.

In case of Jersey cows no statistically significant relationships were recorded between the length of the dry period and values of analysed milk performance traits.

Jersey cows at all variants of dry period length exhibited the lowest milk production, differing highly significantly from both genotypes of Black-and-White Polish Holstein-Friesian cows. The highest contents of fat, protein and total solids in milk were recorded in milk produced by Jersey cows.

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Wpływ długości okresu zasuszenia na cechy użytkowości mlecznej krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej i Jersey

STRESZCZENIE

Celem pracy było zbadanie wpływu długości okresu zasuszenia na cechy użytkowości mlecznej krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej i Jersey utrzymywanych w podobnych warunkach środowiskowych. Populacje krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej podzielono na dwa genotypy (z udziałem genów rasy hf w genotypie ≤87,5% i >87,5%). Przeprowadzona analiza statystyczna wykazała, że długość okresu zasuszenia ma wysoko istotny wpływ na liczbę dni doju, wydajność mleka i tłuszczu u krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej o udziale genów rasy hf w genotypie ≤87,5% oraz na zawartość białka w mleku krów obu genotypów zwierząt tej rasy. Stwierdzono istotną zależność między długością okresu zasuszenia a wydajnością mleka i białka oraz zawartością tłuszczu w mleku krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej o większym udziale genów rasy hf (>87,5%).

Najwyższą wydajnością mleka w okresie laktacji charakteryzowały się krowy rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej o udziale genów rasy hf w genotypie >87,5%.

W przypadku krów rasy Jersey nie odnotowano statystycznie istotnych zależności między długością okresu zasuszenia a wartościami badanych cech użytkowości mlecznej.

U krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej najkorzystniejszą długością zasuszenia ze względu na wydajność mleka w laktacjach 305-dniowych były przedziały: 64–70 dni (dla genotypu z udziałem genów bydła hf >87,5%) i 57–63 dni (dla krów o udziale genów bydła holsztyńsko-fryzyjskiego ≤87,5%), natomiast najgorszy był okres trwający ≤42 dni.

Krowy rasy Jersey niezależnie od długości okresu zasuszenia odznaczały się najniższą produkcyjnością mleczną różniącą się pod względem statystycznym wysoko istotnie z obu genotypami krów rasy polskiej holsztyńsko-fryzyjskiej odmiany czarno-białej.

Najwyższą zawartość tłuszczu, białka i suchej masy w mleku posiadało mleko pochodzące od krów rasy Jersey.