

EFFECT OF SELECTED FACTORS ON REASONS OF CULLING IN MILK COWS

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Abstract. Excluding cow from the herd is one of the most important decisions made by milk producers, which effects on breeding progress as well as economics of production. The aim of the study was to estimate influence of selected factors (breeding region, cow origin, cattle breed) on reasons of dairy cows culling. Breeding region and cow origin had strong ($p < 0.01$) effect on reasons of culling. Also cattle breed significantly ($p < 0.05$) influenced on reason of cow exclusion from herd. The major reasons of culling were infertility and reproductive disorders (39%), then udder diseases (15.3%) and others (14.2%). However, udder diseases were reason of culling in only 8.1% of no Holstein-Frisian cows. On the other hand, number of native cows culled due to udder diseases was higher (15.7%) than results for imported cows (12.5%).

Introduction. Milk production can bring economic profits which led to intensification in dairy cattle production. Increasing milk yield became the main reason determining success in this field of production, but it is also connected to many other conditions that must be fulfilled (genetic potential, appropriate level of nutrition, environmental and herd conditions) if producers want to reach high production.

Disorders during lactation may be the cause of failure and can bring numerous health problems (shortened herd life, decreased fertility and udder diseases or lower content of milk fat and protein). In extreme cases health disorders may lead to animal culling. One of the most important decisions made by producers is being made when it comes to cow's culling. According to Reklewski et al. (2004), it influences on economic value of production and achieving breeding progress. Rate of culled animals in herd shows pace of generation replacement. Reasons for culling can be voluntary or involuntary (Fetrow, 1987). Intentional reasons are connected with selection and have positive impact on improving animal potential due to faster generation replacement. Random reasons of culling or poor health condition determine involuntary culling. According to American studies, optimum

culling rate for dairy farms that have profitable production is 25-35% (Rogers et al., 1988). In turn, level of selection in European dairy cattle population is lower and maintained in the range of 20-30% (Oprządek i Oprządek, 2006). Increased amount of cows culled because of undesirable reasons, e.g. udder diseases, fertility disorders, accidents, generate economic loss and higher costs of herd maintenance.

Objective. Objective of the study was to evaluate influence of breeding region, animal origin and cattle breed on reasons of dairy cows culling.

Materials and methods. Data for further analyzes consist milking records downloaded from SYMLEK system, running by Polish Federation of Cattle Breeders and Dairy Farmers, containing reasons of culling of 2138 cows originated from population of dairy cows located in Lubelskie and Pomorskie regions.

Nonparametric Chi-square test was used in order to calculate frequency of each culling reason. Animal origin, breeding region and cattle breed considered as factors effecting on percentage of culling in cows.

Moreover, reasons of animal culling were analyzed according to SYMLEK database: sold for further breeding, low yield, udder diseases, fertility and reproductive disorders, old age, metabolic and digestive diseases, respiratory diseases, locomotion disorders, accidents, others.

Results and discussion. Table presents reasons of culling depending on breeding region. The major cause of culling were fertility and reproductive disorders (39%), but also udder diseases (15.3%), others (14.2%), locomotion disorders and accidents (9.0%).

Detkens (1974), indicated that already in 1961-1968 fertility and reproductive disorders were one of the most important reasons of culling. Similar results in national references were presented by Litwińczuk et al. (1984), in their study, were due to infertility and low milk yield 33% and 34% cows were culled, respectively. Bascom and Young (1998), also confirmed fertility and reproductive disorders, udder diseases and low yield as major reasons for dairy cows culling. Studies of Łukaszewicz and Krencik (1991), stated that infertility was the main reason of culling (35%). Also, their research, pointed out that 32.5% of all cows culled because of accidents, which contained of locomotion disorders, perinatal and metabolic diseases. Currently, this issues are being scored as completely separated reasons.

Breeding region had significant influence ($p < 0.01$) on reason of cow culling. In lubelskie region cows were excluded from herd mainly due to fertility and reproductive disorders (38.7%), udder diseases (17.5%), locomotor disorders (10.6%), accidents (9.7%) and others (9.5%). Similar results were observed in pomorskie region, where the major reasons of culling were

fertility and reproductive disorders. However, others (19.8%), udder diseases (12.9%) and accidents (8.1%) were another important reasons.

Table – Reasons of dairy cows culling according to breeding region, animal origin and cattle breed.

reasons of culling		breeding region		animal origin		breed		total
		lubelskie	pomorskie	imported	native	PHF	other	
sold for further breeding	N	55	27	3	79	76	6	82
	%	4.8	2.7	1.2	4.2	3.8	4.4	3.8
low fertility	N	15	18	2	31	26	7	33
	%	1.3	1.8	0.8	1.6	1.3	5.2	1.5
udder diseases	N	201	127	31	297	317	11	328
	%	17.5	12.9	12.5	15.7	15.8	8.1	15.3
fertility and reproductive disorders	N	445	388	78	755	778	55	833
	%	38.7	39.3	31.5	39.9	38.8	40.7	39.0
old age	N	13	31	0	44	41	3	44
	%	1.1	3.1	0.0	2.3	2.0	2.2	2.1
metabolic and digestive diseases	N	71	45	15	101	112	4	116
	%	6.2	4.6	6.0	5.3	5.6	3.0	5.4
respiratory diseases	N	8	3	2	9	11	0	11
	%	0.7	0.3	0.8	0.5	0.5	0.0	0.5
locomotor disorders	N	122	73	30	165	181	14	195
	%	10.6	7.4	12.1	8.7	9.0	10.4	9.1
accidents	N	112	80	27	165	179	13	192
	%	9.7	8.1	10.9	8.7	8.9	9.6	9.0
others	N	109	195	60	244	282	22	304
	%	9.5	19.8	24.2	12.9	14.1	16.3	14.2
all	N	1151	987	248	1890	2003	135	2138
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Chi ² = 76.468. P≤0.01		Chi ² = 45.398. P≤0.01		Chi ² = 18.097 P≤0.05		

Those two investigated breeding regions differ significantly among themselves e.g. in conditions of forage production or/and production system. Most cows in lubelskie region during the whole year are kept in cubicle system with TMR or PMR feeding system, while in pomorskie region cow can seasonally use pasture. The consequence of different housing system in Pomorskie region may be lower percentage of animals culled because of udder diseases (by 4.6%) and locomotor disorders (by 3.2%).

Cow origin had strong effect ($p < 0.01$) on culling reasons. Analysis suggested that main reason of cow culling were fertility and reproductive disorders (31.5%), then others (24.2%), udder diseases (12.5%) and locomotor disorders (12.1%). Infertility and reproductive disorders were also the most important reasons for culling cattle belong to native population, which

resulted in cow exclusion from production of 39.9% of whole culled cows. However, animals were culled also because the udder diseases (15.7%), locomotor disorders and accidents (8.7%).

Previous studies (Gnyp et al., 1995; Kaczmarek i Dorynek, 1988; Czaplicka et al., 2013), confirmed that fertility and reproductive disorders are the most common reasons of culling according to country of origin. Another reasons of culling, according to animal origin, are similar to results presented in research of Czaplicka et al. (2013).

Lower percentage of cows culled due to infertility and reproductive disorders and udder diseases in population of imported cattle may be connected with differences in breeding programs. In some countries reproduction traits were included much earlier to selection index, which resulted in improvement of these traits in those population of dairy cows. The reason of higher level of animals culled for locomotor disorders and others (3.4% and 11.3%, respectively) can be stress during adaptation process in new environmental conditions (caused by different forage quality or housing system).

Cattle breed of animal kept in herds have had a significant ($p < 0.05$) effect on reasons of culling. The major reason of culling of Polish Holstein-Friesian (PHF) and other breeds were infertility and reproductive disorders (38.8% and 40.7%, respectively). Studies conducted by Chmielnik et al. (1991), Pawlina et al. (1991), Kaczmarek and Dorynek (1988), suggested that cow genotype does not influence the changes in frequency of cows culled due to infertility and reproductive disorders. According to Gnyp et al. (1995), percentage of animals culled because of infertility and reproductive disorders increases linearly with proportion of Holstein-Friesian (hf) genes.

PHF cows were excluded from herds mainly due to udder diseases (15.8%), others (14.1%), locomotion disorders and accidents, 9.0% and 8.9% respectively. In case of other breeds, animals culled for other reasons (16.3%), locomotion disorders (10.4%), accidents (9.6%) and udder diseases (only 8.1%). However, increasing level of hf genes was associated with higher number of cows culled due to udder diseases and accidents, which was also confirmed in results of studies by Hibner (1991) and Kawęcki et al. (1991).

Values for each reason of culling are similar, except for udder diseases. Lower milk yield of other breeds may effect on less number of cows culled because of udder diseases (by 7%). Other breeds have lower environmental requirements.

References presented variable results of reasons for dairy cows culling with different proportion of hf genes. Analysis of influence of genetic potential of cows on reasons of culling implies that low yield is less frequently the reason of exclusion from herd within cows with increasing amount of hf genes. The same relationship presented Stenzel et al. (1988) and Szarek et al. (1987).

Close. In conclusion, breeding region and cow origin have significant ($p < 0.01$) effect on reasons of culling. Cattle breed significantly ($p < 0.05$) influences on reason of cow exclusion from herd. The most important reasons of culling were infertility and reproductive disorders (39%), then udder diseases (15.3%) and others (14.2%). However, udder diseases were reasons of culling in only 8.1% of other cow breed. On the other hand, number of native cows culled due to udder diseases was higher (15.7%) than imported ones (12.5%).

REFERENCES

1. Bascom S.S., Young A.J.: A summary of the reasons why farmers cull cows. *J. Dairy Sci.*, 81, 2299-2305. 1998
2. Chmielnik H., Jankowska M., Rohde A.: Długość użytkowania i przyczyny brakowania krów cb z różnym udziałem krwi hf. *Zesz. Nauk. Prz. Hod.*, 3, 51-56. 1991
3. Detkens S.: Spostrzeżenia na temat długowieczności i przyczyn wybrakowania krów. *Prz. Hod.*, 1, 3-4. 1974
4. Fetrow J.: Culling dairy cows. *Proc. 20th Ann. Conv. Am. Assoc. Bovine Pract.*, Phoenix. A2, 102-107. 1987
5. Gnyp J., Trautman J., Kamieniecki K.: Płodność i przyczyny brakowania krów mieszańców z różnym udziałem genów bydła rasy holendersko-fryzjijskiej. *Med. Wet.*, 9, 533-535. 1995
6. Hibner A.: Efektywność użytkowania w warunkach produkcyjnych krów rasy nizinnej czarno-białej w porównaniu z mieszańcami o udziale 50% i 25% genów rasy holendersko-fryzjijskiej. *Rozpr. hab., Zesz. Nauk. AR we Wrocławiu*, 94. 1991
7. Kaczmarek A., Dorynek Z.: Brakowanie krów mieszańców holendersko-fryzjijskich z nizinym czarno-białym w stadach o różnym poziomie mlecznej wydajności. *Rocz. AR w Poznaniu, Zoot.*, 35, 49-55. 1988
8. Kawęcki A., Grzesiak W., Bobryk B.: Zależność między genotypem, produktywnością stad a brakowaniem krów mieszańców hfxc. *Zesz. Nauk. Prz. Hod.*, 3, 90-94. 1991
9. Litwińczuk Z., Borkowska D., Oberda A.: Obserwacje nad długością użytkowania mlecznego i przyczynami brakowania krów w oborze zarodowej. *Medycyna Wet.*, 2: 122-125. 1984
10. Łukaszewicz Z., Krencik D.: Przyczyny brakowania krów w okręgu olsztyńskim. *Prz. Hod.* 1, 3-4. 1991
11. Czaplicka M., Szalunas T., Puchajda Z.: Porównanie użytkowości mlecznej krów holendersko-fryzjijskich importowanych z Francji i ich krajowych rówieśnic. *Roczniki Naukowe Polskiego Towarzystwa Zootechnicznego*, t. 9 (2013), nr 1, 9-15 2013
12. Oprządek J., Oprządek A.: Brakowanie i remont stada, świadoma decyzja hodowcy, czy wymuszona konieczność? *Hodowla Bydła*, 12, 24-27. 2006
13. Pawlina E.: Efektywność krzyżowania bydła nizinnego czerwono-białego z holendersko-fryzjijskim. *Rozpr. hab., Zesz. Nauk. AR we Wrocławiu*, 97. 1991
14. Reklewski Z., Łukasiewicz M., Dymnicki E., Oprządek J.: Brakowanie a jakość genetyczna krów mlecznych. *Prace i Mat. Zoot.*, 61, 45-57. 2004
15. Rogers G.W., Danil M.C., Dentine M.R., Norman H.D.: Relationship among proofs for survival, culling, among yields in first and later lactations. *J. Dairy Sci.*, 72, 528-532. 1989
16. Stenzel R., Kamieniecki K.: Wydajność i płodność krów czarno-białych i mieszańców z hf. *Acta. Ac. Agric. ac Techn. Olst., Zoot.*, I, 29-34. 1988
17. Szarek J., Feleńczak A., Brzuski P., Ormian W., Szczerek M., Matras Z., Bąk J.: Określenie różnic między bydlęciem ncb i nczb a jego mieszańcami z hf co do cech ilościowych i jakościowych użytkowości mlecznej. *Zesz. Nauk. AR w Krakowie, Zoot.*, 25, 218, 133-145. 1987