Reerences

BOBČEK,B.: Analýza produkčných vlastností materských plemien ošípaných s ohľadom na možnosť speňažovania podľa podielu mäsa v jatočnom tele. Habilitačná práca, SPU Nitra, 1991, s.1-98.
BOBČEK,B. - LOJDA,V.: Analýza produkčných vlastností otcovských syntetických línií ošípaných v SR. In: Zborník XVII. genetické dny, MZLU Brno, 1996, s.159-160.
BOBČEK,B. - ŘEHÁČEK,P.: Analýza produkčných ukazovateľov materských a otcovských plemien ošípaných za roky 1991 - 1998 v SR. In: zborník z medzinárodnej konferencie „Ako smerovať chov ošípaných do 21. storočia“, SPU Nitra, 1999, s. 113-117.
ČECHOVÁ,M. - BUCHTA,S. - PRAŽÁK,Č.: Šlechtení moderních masných typu prasat v ČR. In: zborník „Problémy a perspektívy rozvoja plemenárskej práce v chove ošípaných na Slovensku“, SPU Nitra, 1996, s.40-42.
FĽAK,P. - HETÉNYI,L. - BOBČEK,B.: Analýza rastu výkrmových a jatočných uakazovateľov bieleho ušľachtilého a bieleho mäsového plemena. In: Acta zootechnica č.53, SPU Nitra, 1997, s.39-45.
MATOUŠEK,V. - KERNEROVÁ,N. - PRAŽÁK,Č.: Šlechtitelské a chovatelske programy v chovu prasat v ČR. In: zborník „Problémy a pespektívy rozvoja plemenárskej práce v chove ošípaných v SR“, SPU Nitra, 1996, s.33-39.
POLTÁRSKY,J.: Plemenárstvo v chove ošípaných. In: zborník „Manažment a narketing v chove ošípaných“, SPU Nitra, 1996, s.208-215.
POUR,M.: Perspektívy chovu prasat v České republice na počítku třetího tisícletí. In: zborník „Ako smerovať chov ošípaných do 21. storočia“, SPU Nitra, 1999, s.64-68.

RELATIONSHIP BETWEEN CAUSES OF COWS' NEGATIVE SELECTION AND THEIR MILK PERFORMANCE AND EXTERIOR

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Summary

Milk performance, exterior valuation and causes of culling were observed in 188 cows of Bohemian Spotted Cattle and 345 Holstein cows bred in the same conditions in submountains region. The differences between exterior formation all cows in herd and cows eliminated from herd were certified. Bohemian Spotted Cattle cows' selection were lower (30.85%) than selection of Holstein cows (38.84%). The differences between exterior formation of cull cows and non cull dams were founded.

Key words: cattle; cows' exterior; culling

Introduction

The level stayability of cows and causes of their culling from herd is important for permanently tenable agriculture and its economics. SCHAEFFER and BURNSIDE (1974) consider as the most important factors, what influence stayability of cows, milk performance and valuation of type, respective of exterior of dams, too.
The data about lifelong production, milk yield, content of milk fat and proteins and 28 traits of body conformation in 34 322 dairy cows were analysed by KLASSEN, MONARD and JAIRATH (1992) in Canada. Majority of phenotype correlation between lifelong production with traits of exterior was from 0.15 to 0.20, except body capacity, back and legs, what were about 0.07. Genotype correlation were high between lifelong production and angularity (r=0.44 – 0.55) and milk character (r=0.53 – 0.56).
PUTZ (1995) determine by analysis of valuation of Spotted Cattle exterior in Bavaria, that animals with limbs defect, for example in position of legs, marked joints, defect of pastern and hoofs, have worse production and longevity.
The aim of observation were to found the differences of body conformation cows culling from causes a low production, mastitis, fertility defect, occurrence of difficult calving and the other zootechnician reasons, and non culling cows.

Material and methods

Milk performance, valuation of exterior and causes of culling of 188 Bohemian Spotted Cattle cows and 345 Holstein cows are observed in farm in submouitains region in 1999 – 2000 years. Both races were bred in the same technology (free housing), management and nutrition.

Results

The differences in order of lactation during negative selection and in the estimate breed value for parameters of milk performance in culling dams are in table 1. Average values show, that in this technology, Bohemian Spotted dams are culled oldest than Holstein cows (2.98; resp. 2.33 lactation). Bohemian Spotted cows, culling from causes a low production, have distinctly lowest breed value of individual parameters of milk performance in compare with Holstein cows. This fact shows that the selection of Bohemian Spotted Cattle is stricter and negative selection of the Holstein dams from causes a low production is influenced also other factors.
Fifty eight cows of Bohemian Spotted Cattle (30.85%) and 134 Holstein cows (38.84%) generally were culled in observed herd.
The low value lactation order of Holstein cows culling from causes fertility defect (1.98) shows the frequent culling of cows from cause infertility on 1st and 2nd lactation. It coheres with highest percent of Holstein cows selection in compare with Bohemian Spotted Cattle ones.
Significantly different values of individual exterior traits of dams culling from observed reasons in compare with average value of ones of observed herd are stated in tables 2 and 3 on the grey background. Bohemian Spotted Cattle cows culled from cause low production were more big (6.0 points), with more expressive fleshing (5.86 points), with worse formation of rear udder (4.86 p.), with plain udder centre ligament (2.86 p.) and small depth of udder (6.14 p.). Occurrence of difficult calving is connected with shorter and thinner rump (4.86 and 3.14 points).
Also the probability of Holstein cow negative selection from cause low production is connected with bigger framework (5.37 points), open position of hind legs and more flat hoofs, with better fore udder attachment (6.15 p.), but with worse formation of rear udder (5.15 p.). The difficult calving had relationship with upcast rump of cows (4.46 points).

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Table 1 Average lactation order and average breed values of negative selection cows

Parameter	Breed	Cause of culling					Total
		Low production	Mastitis	Fertility defect	Difficult calving	Other causes	
Lactation order	C	2.14	3.11	2.58	3.63	3.91	2.98
	H	2.23	2.6	1.89	2.67	2.71	2.33
Breed value kg of milk	C	-177	72	-27	127	78	66
	H	-3	75	-1	113	30	58
Breed value % of protein	C	0.02	0	0.02	0.04	0.05	0.03
	H	0.07	0.03	0	0	0	0.03
Breed value kg of protein	C	-6.3	3.75	0.45	6.38	4.73	4
	H	3.27	1.37	0.4	3.6	0.83	0

Table 2 Average values of selection parameters of negative selection cows of Bohemian Spotted Cattle exterior

Traits of exterior (points)	Cause of culling					Average value of herd
	Low production	Mastitis	Fertility defect	Difficult calving	Other causes	
Height in hips	6.00	4.75	4.52	4.43	4.64	4.5
Fleshing	5.86	5.13	5.28	5.14	5.27	5.4
Length of rump	6.00	5.00	5.00	4.86	5.64	5.2
Width of rump	4.43	4.63	3.96	3.14	4.45	3.7
Position of hind legs	4.86	6.25	5.72	6.00	5.73	5.6
Hock	5.57	6.38	6.36	6.71	6.18	6.3
Length of udder	5.00	5.25	5.44	5.57	4.55	5.4
Rear udder	4.86	5.75	5.32	5.57	5.36	5.9
Udder centre ligament	2.57	3.50	4.24	5.43	5.45	4.5
Udder depth	6.14	5.63	5.20	5.57	4.55	5.3
Teats location	4.86	3.75	4.25	4.57	4.00	4.1

Table 3 Average values of selection parameters of negative selection cows of Holstein exterior

Traits of exterior (points)	Cause of culling					Average value of herd
	Low production	Mastitis	Fertility defect	Difficult calving	Other causes	
Size	5.37	4.72	4.85	5.23	4.97	4.6
Rump slope	5.00	4.89	4.87	4.46	4.97	4.7
Position of hind legs	6.00	5.56	5.73	5.69	5.71	5.7
Hoofs	4.08	4.33	4.31	4.69	4.16	4.4
Fore udder	6.15	5.22	5.54	5.62	5.66	5.5
Rear udder	5.15	5.78	5.75	5.69	6.11	6.0
Udder centre ligament	4.15	4.72	4.81	4.92	4.13	4.8
Udder depth	6.69	5.89	6.48	6.38	5.89	6.1
Teats location	4.31	4.17	4.37	4.54	4.45	4.4

References

SCHAEFFER. L. R.. BURNSIDE. E. B.: Survival rates of tested daughters of sires in artificial insemination. Journal of Dairy Science. 1974. 57. s. 1394-1400.
KLASSEN. D. J. et al.: Genetic correlations between lifetime production and linearized type in Canadian Holsteins. Journal of Dairy Science. 75. 1992. č.8. s.2272-2287.
PUTZ. M.: Chovný cíl a program šlechtění strakatého skotu v Bavorsku. In: Chov strakatého skotu 2000. Dům techniky České Budějovice s.r.o.. 1995. s. 1 – 20.

THE POLYMORPHISM OF PRNP GENE IN CATTLE

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Summary

The PRNP gene frequency of the allele 6 : Czech pied cattle =0,92 (113 heads); Black and white cattle = 1,00 (10 heads); Pinzgau cattle = 1,00 (13 heads); Charolais cattle = 0,93(29 heads);. The homozygous genotype of PRNP 5/5 was find only in the set of Czech pied and Charolais cattle. The gene frequency of the allele PRNP 6 in gene reservation stocks were: Czech red cattle = 0,95 (64 heads) and Polish red cattle = 0,91 (63 heads).
The breeding value for milk production was higher in homozygous Sires of the genotypes PRNP 6/6 in comparison with heterozygous Sires PRNP 5/6.

***Key words*:** PRNP gene, alleles frequency, cattle, breeding value

Introduction

The neurodegenerative desease – bovinae spongiform encefalophaties (BSE) in cattle, the scrapies in sheep and Creutzfeld-Jacobs desease in humans is due to aberrant form of prion protein (PrP). This protein is sialoglycoprotein with molecullar weight 27 – 30 kDa. According to various mammalian species it contains 250 – 260 aminoacids(AMA) (picture 1). Polymorphism in the third exon of the PRNP gene is created by three different alleles. They are marked as 5, 6 and 7 due to number of repeats in oktapeptides repetition in the prion protein. Alleles frequention in various breeds of cattle are proved since half 90 - ties. Niebergs et al. (1994) found gene frequencies for the allele 6 in threre breeds of cattle: Holstein = 0,88 (94 heads), Brahman 0,95 (40 heads) and Brangus 0,95 (40 heads). Schapfer et al. (1998) described frequency of the allele PRNP 6 = 0,85 (72 heads) in the breed of Swis brown. Only in this breed was found allele 7 in very low frequency.
Recently Premzl et al. (2000) described frequency of the allele 6 in original Croatian breeds and other breeds, following: Simental 0,97 (70 heads), Holstein-Friesian = 1,0 (9 heads), Istrain 1,0 (22 heads), Slavonian Syrmian = 0,63 (12 heads). Vrtkova et al. (2001 a, b) studied gene frequency in Czech republic in the stocks of gene reserve Czech red cattle as well as Polish red cattle. In this work we would give an information on PRNP gene polymorphism and association of different genotypes of Sires to their breeding value.
The prion gene in cattle is localised at 13 chromozome (Schäpfer et al., 1998). The structure of the prion gene is described by Horiuchi et al. (1998) pict. Nr. 2). The informations on prion protein are immersed in third exone and cover 4 244 bp.