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Conference paper

AN EFFECT OF CROSSING WITH FRENCH BEEF BREEDS ON MEAT PERFORMANCE OF BULLS

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Abstract

Fattening experiment involved 13 purebred Czech Pied (C) bulls, 10 Blond'd'Aquitaine (B) and 11 Charolais (CH) F_1 generation crossbred bulls coming from Czech Pied dams. Durind the fattening period, animals were fed with corn silage, alfalfa hay and concentrates up to the final weight of 567 (C), 573 (B) a 566 (CH) kg (age 550, 523 and 556 days resp). As for the fattening performance, average daily gain during the fattening period for C, B and CH was 1145, 1284 and 1332 g resp., net weight gain was 538, 607, and 543 g resp. Significantly highest dressing percentage ($p<0.01$) reached B bulls (60.6%) compared with C (57.4%) and CH (58.0%). Differences in the total amount of fat were not significant with relative values 2.6 (c). 2.2 (b) and 2.7 (CH)%. The technological analysis of carcasses revealed significant differences ($P<0.01$) in the proportion of first-rate meat (C=38.7%, B=41.3% and CH=40.1%). More subtle skeletons of B group were characterised by significantly ($P<0.05$) lower proportion of bones (16.7%) in comparison with C and CH groups (17.8%). There were insignificant differences among groups in the results of chemical analysis of eye-muscle samples (dry matter content, fat content and crude protein content).

Introduction

In the past six years, a heavy decline in numbers of cattle occured in the Czech Republic. Whereas in 1989 1250000 cows were kept here, at present there are less than 800000. Dairy breeds (Holstein) and dual-purpose breeds (Czech Red Pied) are used predominantly. In the interest of ensurance of sufficient high quality beef production, beef cattle of various breeds is being increasingly utilized. In addition to pure breeding also commercial crossing proves to be competent.

The object of this study was to compare fattening abilities and carcass value traits of pure bred Czech Red Pied bulls with crosses of this breed with French beef breeds Blonde d'Aquitaine and Charolais.

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Material and Methods

Thirteen bulls of Czech Red Pied breed (C), 10 bulls-crossbreds after Blonde d'Aquitaine sires (B), and 11 bulls after Charolais sires (CH) were included in experimental fattening. As dams, sows of Czech Red Pied breed were used. Young bulls were reared by their dams, and after weaning stabled in a fattening station at an average weight of 265 kg. Feed ration was based on corn silage, hay, and concentrate mixture. In the course of fattening, all animals were regularly weighed. The fattening was finished after the animals had achieved the live weights of 570 kg. After slaughter, a slaughter analysis was carried out, in which carcass dressing percentage, net weight gain, weight of suet exploited at slaughterhouse (kidney, rumen and intestinal fat) and weight of skin were found out. 24 hours after slaughter, dissections of right half carcasses were carried out. The area of musculus longissimus dorsi cross-section was determined. MLD at the level of vertebrae 9-11 was sampled for chemical analysis.

Results and Discussion

Result of fattening performance are given in tab. 1:

Tab. 1.

Characteristic		Group		
		C	B	CH
Starting weight	kg	267.8	264.5	265.8
Weight before slaughter	kg	567.4	573.3	566.3
Age at slaughter	day	550.1	523.1	556.4
Daily gain	kg	1.145	1.284	1.332

The minimum differences between groups C, B, and CH were in weights by stabling (267.8; 264,5 and 265.8 kg, respectively), and in weights before slaughter (567.4; 573.3, and 566.3 kg, respectively). Any significant differences were found out neither in age when slaughtering. The highest daily average gain was found out in group CH, the lowest one in group C, the differences, however, were also insignificant. Very good results of fattening capacity in crosses of CH breed were also reported by Southgate et al. (1988) and Guhe et al. (1994) in their studies.

Results of slaughter analyses can be seen in tab. 2. Bulls of B group achieved the highest statistically significant carcass dressing percentage and net daily gain (60.6% and 607 g, respectively). Similar results were also reported by Kögel et al. (1994). A higher carcass dressing percentage of

crossbreds of B anc CH breeds in comparison with C bulls was also found out by Frelich et al. (1994). Statistically significant differences were found out in proportion of skin weight to slaughter weight. Bulls of B group had the lightest skin. The lowest absolute and relative weights of suest exploited at slaughter house were also found out in B group.

Tab. 2.

Characteristic		Group		
		C	B	CH
Carcass weight	kg	325.5^{a}	347.0^{b}	328.4^{a}
Dressing percengate	%	57.39^{A}	60.56^{B}	58.00^{A}
Net weight gain	kg	0.538^{A}	0.607^{B}	0.542^{A}
Skin weight	kg	49.1	44.0	46.2
Skin weight	%	8.66^{a}	7.66^{b}	8.16^{ab}
Suets	kg	14.6	12.9	15.1
Suets	%	2.57	2.24	2.66

Different superscripts indicate significant differences:
a,b,c - P<0.05 A,B,C - P<0.01

Results of technological analysis of half carcasses of bulls are given in tab. 3:

Tab. 3.

Characteristic		Group		
		C	B	CH
Right side weight	kg	159.2^{A}	170.6^{B}	160.8^{A}
Quality I meat	kg	61.6^{A}	70.3^{B}	64.5^{A}
Quality I meat	%	38.7^{Aa}	41.2^{Bb}	40.1^{Bc}
Quality II meat	kg	66.0^{abe}	69.5^{Ab}	63.5^{Ba}
Quality II meat	%	41.4^{a}	40.7^{a}	39.5^{b}
Total meat	kg	127.6^{A}	139.8^{B}	128.1^{A}
Total meat	%	80.2^{A}	82.0^{B}	79.6^{A}
Separable fat	kg	2.8^{A}	1.8^{B}	2.8^{A}
Separable fat	%	1.7^{A}	1.0^{B}	1.7^{A}
Bones and tendons	kg	28.3	28.5	28.7
Bones and tendons	%	17.8^{a}	16.7^{b}	17.9^{a}
Meat: bones ratio		4.52^{A}	4.91^{B}	4.48^{A}
MLD area	cm^2	67.5	80.7	78.3

Different superscripts indicate significant differences:
a,b,c - P<0.05 A,B,C - P<0.01

As far as the yield of first quality meat is concerned, bulls of B and CH group achieved a proportion of 41.2% and 40.1%, respectively, which was markedly more than in bulls of C group. As far as the yield of second quality meat is concerned, the results were opposite and the highest proportion (41.4%) was found out in bulls of C group. When comparing total meat production, bulls of B group achieved significantly better results (139.8 kg, i.e. 82%) in comparison with remaining groups. A finer skeleton of bulls of B breed was reflected in results of bone and tendon proportions to the carcass. This proportion was significantly lower than in than in both further groups. There results reflected in the proportion of meat : bones which was again favourable to B bulls. Similar tendency was also reported by Šubrt (1994) when evaluating carcasses of bulls of C, CxB, and CxCH breeds.

Results of chemical analyses of MLD meat samples are given in tab. 4:

Tab. 4.

Characteristic		Group		
		C	B	CH
Solid content - MLD	%	25.27	24.77	25.49
Fat content - MLD	%	3.28^{A}	2.08^{B}	3.43^{A}
Crude protein content - MLD	%	20.91^{a}	20.99^{a}	20.47^{b}

Different superscripts indicate significant differences:
a,b,c - P<0.05 A,B,C - P<0.01

The lowest proportion of fat and the highest proportion of protein were significantly diferent, and were found out in samples of B group. Surprisingly, the highest values of fat proportion were found out in CH group. The study of Šubrt and Schmidt (1994) confirmed a tendency to decrease in intramuscular fat in crosses with B breed.

Conclusions

Favourable results of our experiment demonstrate the possibilities of meat performance improvement in domestic Red Pied breed by means of breeding work, namely with the help of commercial crossing with bulls of French beef breeds:

– both groups of crosses achieved a higher weight gain in comparison with C group;

– bulls of B group proved to be best when evaluating the results of carcass dressing percentage and net gain;

– bulls of B group achieved the best results even when evaluating the analysis of half-carcases;

– bulls of B group showed a tendency towards a lower fat content and a higher protein content in meat.

REFERENCES

1. Frelich, J., J. Voříšková, A. Vejčík, M. Maršálek, D. Pazderková, J. Zedníková, L. Milisdörfer (1994): Využitelnost masných plemen skotu při užitkovém křížení. Kílčí závěrečná zpráva. České Budějovice, Jihočeská univerzita.
2. Guhe, M., R. Preisinger, C. Augustini, M. Hennig, E. Kalm (1994): Effect of Genotype and Production System on the Carcass Value of Fattening Bulls. Zuchtungskunde, 66, 3, 180-197.
3. Kögel. J., M. Pickl, B. Spann, J. Helminger (1994): Superiority of crossbred bulls »French beef breeds x Bavarian Flecksieh«. 45th Annual Meeting of EAAP, Edinburgh, UK, Sept.
4. Southgate, J. R., G.L. Cook, A.J. Kempster (1988): Evaluation of British Friesian, Canadian Holstein and beef breed x British Friesian steers slaughtered over a commercial range of fatness from 16-month and 24-month beef production systems. 1. Live-weight gain and efficiency of food utilization. Animal Production, 46, 353-364.
5. Šubrt, J. (1994): Vliv užitkového křížení s masnými plemeny na skladbu jatečného těla býků a jalovic. Živočišná výroba, 39, 4, 321-330.
6. Šubrt, J., I. Schmidt(1994): Vliv masných plemen na nutriční hodnotu masa býků a jalovic. Živočišná výroba, 39, 3, 265-273.

UČINAK KRIŽANJA S FRANCUSKIM TOVNIM PASMINAMA BIKOVA NA OSOBINU PROIZVODNJE MESA

Sažetak

Pokus tova obuhvaćao je 13 čistokrvnih čeških bikova Pied (C), 10 Blon'd'Aquitaine (B) i 11 Charolais (CH) generacije križanih bikova F_1 čije su majke češke Pied ženke. Za vrijeme tova životinje su hranjene kukuruznom silažom, sijenom lucerne i koncentratima do konačne težine od 567 (C), 573 (B) i 566 (CH) kg (starosti 550, 523 odn. 556 dana). Što se tiče performance tovljenja prosječni dnevni prirast za vrijeme tova bio je za C, B i CH 1145, 1234 odn. 1332 g, prirast neto težine bio je 538, 607 odnosno 643 g. Značajno najveći postotak randmana ($p<0.01$) postigli su bikovi B (60.6%) u usporedbi s C (57.4% i CH (58.0%). Razlike u ukupnoj količini masti nisu bile značajne s relativnim vrijednostima 2.6 (C), 2.2 (B) i 2.7 (CH)%. Tehnološka analiza polovica otkrila je značajne razlike ($p<0.01$) u odnosu na prvorazredno meso (C=38.7%, B=41.3% i CH=40.1%). Značajno niži ($p<0.05$) omjer kostiju (16.7%) bio je karakterističan za slabije kosture skupine B u usporedbi sa skupinama C i CH (17.8%). Postojale su neznačajne razlike među skupinama u rezultatima kemijske analize uzoraka MLD (sadržaj suhe tvari, sadržaj masnoće i sadržaj sirovih bjelančevina).

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