

A NOTE ON QUALITY OF CATTLE SLAUGHTERED IN SLOVENIA

S. Žgur, Marjana Drobnič

Summary

In seven commercial slaughterhouses data were collected from July 1994 to June 1998. Altogether data from 147888 carcasses were analysed. In young bulls, which represented the most important category, 6% carcasses were graded into conformation class E and 48%, 37%, 8% and less than 1% into conformation classes U, R, O and P. More than 97% of carcasses were graded into fatness classes 2 and 3. In other categories (calves, heifers, steers, young and old cows and old bulls) carcasses were most often graded into class R, and into fatness class 3. Carcass weight in all categories exhibited high variability. Carcasses with better conformation grades and higher fatness class also exhibited higher weight.

Key words: beef, carcass, grading, standards EUROP, quality

Introduction

The main objective of carcass grading is to describe the value of a carcass in clearly defined terms to facilitate trade. The new Slovenian regulation about carcass grading and classification (Pravilnik o., 1994), which follows official EU regulations, defines five conformation (E, U, R, O, P) and five fatness (1, 2, 3, 4, 5) classes for each category. Therefore carcass weight, conformation and fatness grades largely define the value of a carcass.

The aim of the present analysis was to analyse the distribution of carcasses into conformation and fatness classes and interdependence between carcass weight and conformation and fatness grades.

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Material and methods

In seven commercial slaughterhouses data were collected from July 1994 to June 1998. Altogether data from 147 888 carcasses were analysed. Statistical analysis was performed by using the SAS program's, GLM procedure (SAS, 1989). The influence of conformation and fatness on carcass weight was tested with F-test for each category.

Results and discussion

Distribution of slaughtered animals into EUROP conformation and fatness classes is presented in Table 1. Calves were most frequently graded into conformation class R (more than 50%). More than one third of calf carcasses were graded into class O, about 10% into class U, and less than 5% into classes P and E. Fatness class 3, with almost 60%, followed by class 2 with 37.5% represented the most frequent fatness classes.

Table 1. - DISTRIBUTION OF SLAUGHTERED ANIMALS INTO EUROP CONFORMATION AND FATNESS CLASSES

Categories*	n	EUROP conformation, %					EUROP fatness, %				
		E	U	R	O	P	1	2	3	4	5
1 Calves	16169	1.1	9.6	50.2	35.8	3.3	2.5	37.5	59.9	0.1	-
2 Young bulls	78907	6.3	47.9	3.72	8.1	0.5	0.5	16.2	80.8	2.5	0.0
3 Heifers	28006	1.8	43.3	45.3	8.6	1.0	0.9	5.6	64.7	24.5	4.3
4 Steers	412	0	14.3	63.6	21.6	0.5	2.4	19.2	65.0	12.4	1.0
5 Young cows	5175	4.9	21.3	29.8	30.2	13.8	10.7	23.7	46.4	14.2	5.0
6 Old cows	18547	8.1	23.9	29.6	26.6	11.8	2.4	8.0	72.9	11.8	4.9
7 Old bulls	672	10.9	37.2	38.7	11.9	1.3	2.4	8.0	72.9	11.8	4.9

* calves (carcass weight < 150 kg); bulls (age at slaughter < 24 months); heifers and first calving cows (age at slaughter < 30 months); steers (age at slaughter < 30 months); young cows (age at slaughter < 5 years); old cows (age at slaughter > 5 years); old bulls and steers (age at slaughter < 24 and 30 months respectively)

In the category of young bulls, the highest percentage of carcasses were graded into U conformation class, followed by R, O and E. Carcass distribution of young bulls into conformation classes, which greatly depends on animal

genotype, shows large variability among European countries. In Belgium in 1995, 36% of carcasses were graded into conformation class E, and in Portugal as much as 69% were graded into conformation class P (Commission Europeenne, 1996). The fatness results were very favourable. More than 97% carcasses were graded into fatness classes 2 and 3 (Table 1), which represented optimal, desired fatness classes, which attained the highest price. In most European countries carcasses from young bulls were on average graded into lower fatness classes (Commission Europeenne, 1996).

Conformation of slaughtered heifers was slightly less favourable, with lower percentage of carcasses graded into classes E and U and higher percentage of carcasses graded into classes R, O and P. Heifers were also fatter, so that almost 25% carcasses of heifers were graded into class 4, and even as much as 4.3% were graded into class 5. In Ireland, North Ireland, Netherlands, Britain, Sweden and Finland the percentage of heifers graded into classes 4 and 5 were higher than in Slovenia in 1995 (Commission Europeenne, 1996).

A very small number of steers were slaughtered in this period in Slovenia and most of them were graded into conformation class R and fatness class 3. Compared to bulls, steers had less favourable conformation and higher fatness grades.

About 30% of carcasses of young cows were graded into conformation classes R and O. 21% and 14% were graded into classes U and P. More than 70% carcass of young cows were of optimal fatness, 20% were too fat and 10% had too little fat. Carcasses of older cows showed slightly better conformation with also lower percentage of carcasses with too much or too little fat. In most European countries the carcasses of cows were less fat (Commission Europeenne, 1996). Old bulls demonstrated very similar distribution of carcasses in conformation classes as young bulls, with higher percentage of carcasses graded into fatness classes 4 and 5.

Until this century overfatness was not considered a problem, the aim was to avoid underfatness. Nowadays this situation has been reversed and overfatness is now considered a serious problem (Price, 1995). It seems that in the future carcasses with lower fat content, graded into lower fatness classes, will be preferred.

In Table 2, the average carcass weight in different categories and classes is presented. The veal calves carcass weight was generally very low. Carcass weight in conformation class E was slightly higher than in other four

conformation classes. With increased fatness, carcass weight of veal calves also increased. In West European countries (France, Italy, Netherlands, West Germany, Belgium, Luxembourg) carcass weight increased from 1980 to 1989 for 10 to 35 kg, and was with around 120 kg the lowest in France (DeBoer, 1991). This is almost twice as high as in Slovenia. From other categories, old bulls exhibited the highest carcass weight, followed by young bulls, steers, old and young cows and heifers respectively. The carcass weights in Germany and Austria in 1996 were the following: bulls 354 and 370, heifers 279 and 293 and cows 291 and 299 kg (Arbeitsgemeinschaft Deutscher Rinderzüchter e. V., 1997; Hofinger et al., 1997). The average carcass weights in Slovenia in the same categories were generally lower than in Germany and in Austria, but the differences were much less pronounced than in calves. A large variability in carcass weight is characteristic for all categories. The pattern of altering carcass weight between different classes was also similar in all categories. Better conformation grades and higher fatness class indicated higher carcass weight.

Table 2. - MEANS FOR CARCASS WEIGHT FOR CONFORMATION AND FATNESS CLASSES

Category*	Carcass weight, kg										
	Σ	EUROP conformation					EUROP fatness				
	Mean ±SD	E	U	R	O	P	1	2	3	4	5
1 Calves	69±20	83	72	69	68	69	66	72	68	80	-
2 Bulls	337 ±54	397	356	317	279	179	207	309	342	378	399
3 Heifers	259 ±44	317	272	252	225	176	182	221	250	284	320
4 Steers	306 ±62	-	354	308	269	191	216	267	310	356	360
5 Young cows	279 ±64	370	343	288	242	207	207	238	286	342	381
6 Old cows	282 ±61	362	331	283	245	212	212	242	290	342	374
7 Old bulls	386 ±90	436	409	375	323	224	230	321	393	408	412

* for legend see Table 1

Carcass weight within conformation classes did not vary with fatness classes uniformly, as shown for young bulls in Figure 1. This indicates also significant interaction between conformation and fatness in Table 3. In conformation classes E, U and R, carcass weight increased with fatness classes similarly. Carcass weight from young bulls classified into O and P class increased faster with increased fatness classes.

Figure 1. - CARCASS WEIGHT OF YOUNG BULLS (AGE AT SLAUGHTER < 24 MONTHS) GRADED INTO DIFFERENT CONFORMATION AND FATNESS CLASSES

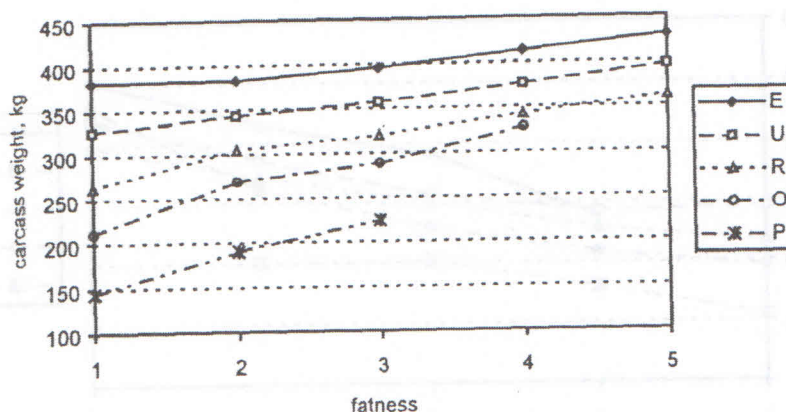


Table 3. - ANALYSIS OF VARIANCE FOR CARCASS WEIGHT

Categories*	p values for		
	EUROP conformation	EUROP fatness	conformation* *fatness
1 Calves	0.06	0.34	0.00
2 Bulls	0.00	0.00	0.00
3 Heifers	0.00	0.00	0.00
4 Steers	0.06	0.00	0.58
5 Youn cows	0.00	0.00	0.00
6 Old cows	0.00	0.00	0.00
7 Old bulls	0.00	0.00	0.01

* for legend see table 1

The differences in carcass weight between conformation classes in heifers (Figure 2) were lower than in young bulls. In the most frequent classes (U, R and O represented more than 97% of graded heifers) carcass weights increased similarly.

Carcass weight of young cows within conformation classes increased linearly by fatness classes. Carcasses weight of young cows graded into conformation classes O and P increased slower than carcasses graded into other three conformation classes. Carcasses with higher conformation were also graded into higher fatness classes and vice versa.

Figure 2. - CARCASS WEIGHT OF HEIFERS (AGE AT SLAUGHTER < 30 MONTHS) GRADED INTO DIFFERENT CONFORMATION AND FATNESS CLASSES

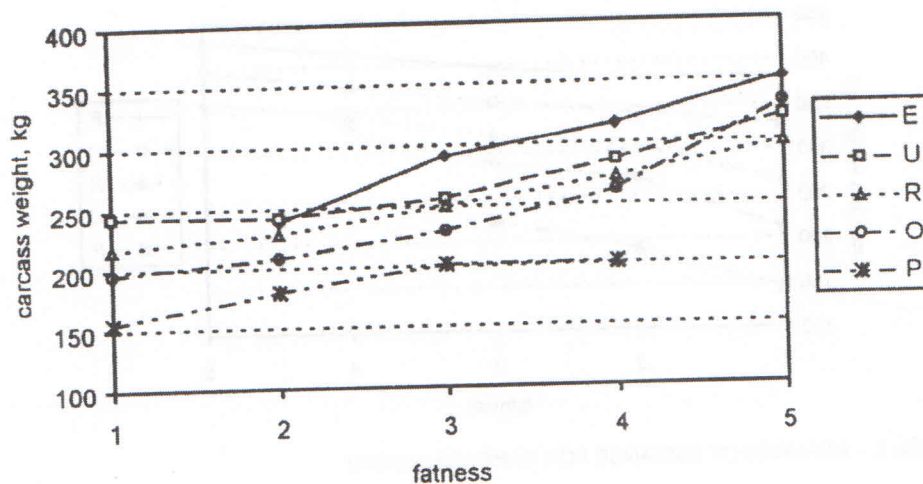
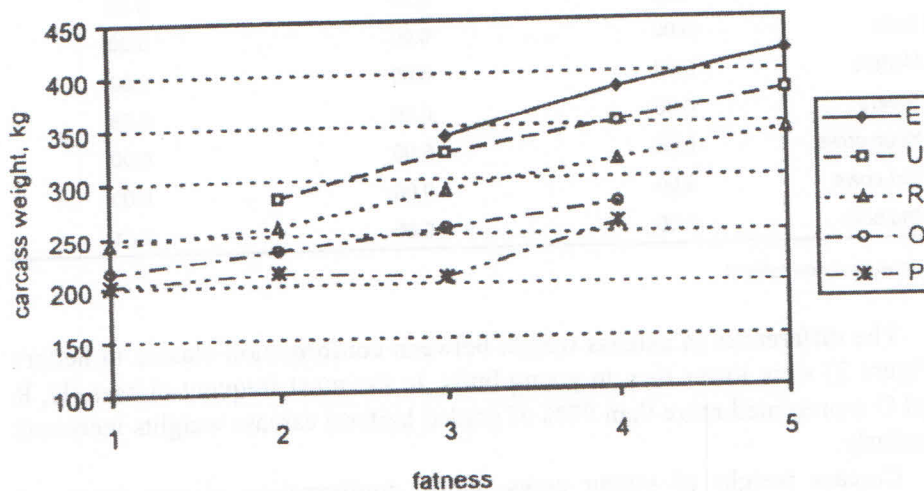
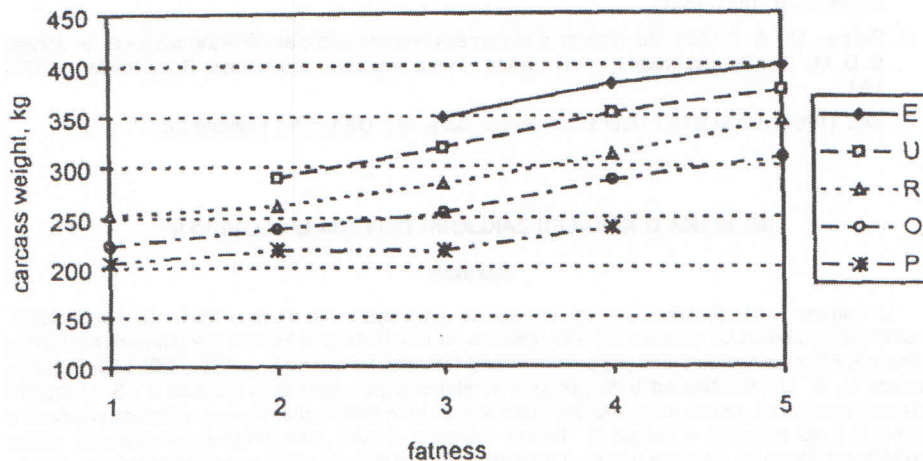


Figure 3. - CARCASS WEIGHT OF YOUNG COWS (AGE AT SLAUGHTER < 5 YEARS) GRADED INTO DIFFERENT CONFORMATION AND FATNESS CLASSES



The same as for young cows is also true for old cows. Carcass weight in conformation class P increased only for 36 kg from fatness class 1 to fatness class 4. In conformation class R the weight difference amounted to 59 kg.

Figure 4. - CARCASS WEIGHT OF OLD COWS (AGE AT SLAUGHTER > 5 YEARS) GRADED INTO DIFFERENT CONFORMATION AND FATNESS CLASSES



Conclusions

Conformation of the carcasses depends mainly on animal genotype, so changing conformation distribution is a long term process, achieved through selection. In the short term, animal fatness can be regulated by the optimal slaughter weight to avoid under- and overfatness. This is obvious for heifers and cows. Almost one third of heifers were too fat and thus achieved lower price. Also one third of young cows and one fourth of old cows were not graded in optimal fatness classes and in this way achieved lower price. In addition to lower price, too fat carcasses will presumably be difficult to marketed. Therefore it will be necessary to pay much more attention to optimal slaughter weight and fatness grades.

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BILJEŠKA O KAKVOČI ZAKLANIH GOVEDA U SLOVENIJI

Sažetak

U sedam komercijalnih klaonica podaci su sakupljeni od srpnja 1994. do lipnja 1998. Analizirani su podaci od ukupno 147888 polovica. U mladih bikova koji su predstavljali najvažniju kategoriju 6% polovica svrstano je po konformaciji (strukтури) u razred E, a 48%, 37% i 8% u manje razrede U, R, O i P. Više od 97% polovica svrstano je po masnoći u razrede 2 i 3. U drugim kategorijama (telad, junice, junci, mlade i stare krave i stari bikovi) polovice su najčešće svrstane u razred R i po masnoći u razred 3. Težina polovica u svim kategorijama pokazala je veliku varijabilnost. Polovice s boljom ocjenom konformacije (strukture) i višim razredom masnoće bile su i veće težine.

ključne riječi: (govedo/govedina), polovice, svrstavanje, standardi, EUROP, kakvoća.

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