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ABSTRACT - To verify the effectiveness of the application of the UE carcass classification in a cattle slaughterhouse, one year of registered data were collected and analysed in detail, to highlight the critical point and to improve the performance of the technical staff, avoiding mistakes in registration. One year of records (corresponding to 49,486 heads) were collected on animals (genetic type, age, sex, live weight) and carcasses (weight, dressing percentage, category, conformation, and fatness). Data were statistically analysed (mean, minimum and maximum value, and/or frequency distribution) to verify their adequacy and to highlight mistakes in registration. The obtained results confirm the need to improve data collection, especially those regarding birth date, live and carcass weight, last two influencing also dressing percentage. Anyway, if the results of paying more attention should be to slow the processing line it could be better to check the data before their official processing.

Key words: Cattle, Slaughter, Carcass data.

Introduction - Several years have passed since the EU introduced in all member countries a system of classification which gives some indication of the parameters to be used for the classification of animal carcasses aiming to facilitate intra-community exchange, to introduce criteria for determining the price in terms of quality and provide guidance to farmers to improve the quality characteristics of the product. The classification of bovine carcasses codified in the European Union provides the market of sides identified for the main parameters of carcass quality: age, sex, conformation, and fatness (Reg. EEC 1208/81). In Italy the D.L. 298/98 (receiving the EEC Regulation 1186/90) imposed the application of this classification to all slaughterhouses approved under D.Lgs. 286/94. Establishments boning all slaughtered cattle, retailers who buy live animals and slaughter them on their own behalf, or in derogation, establishments which are not slaughtered cattle more than 75 adults per week are exempted.

In accordance with EU and national legislation, slaughterhouses have to classify beef carcass for category, conformation and fatness and must state the result of the classification on documents to them referred, should also provide for the survey of market prices (Circular No. 5 on 26 April 1999) and report them promptly to the Ministry of Agriculture and to the Chambers of Commerce competent for jurisdiction.

Even if the assessment system has been consolidated and standardized (by the EC Regulation 1183/2006), it is essential, in view of its economic impact, to verify the correctness of these classifications and analyze the critical points of the system, especially since those who carry out this assessment are still individuals which can run into errors of interpretation of the rules, even if prepared and trained under EEC Regulation 344/91.

This study has been planned to: - acquire data relating to the identification and traceability of slaughtered animals (identification number, genetic type, sex, age, live weight, and carcass weight); - acquire data relating to the classification of the carcass side (category, fleshiness, and fatness); - verify the adequacy of the data acquired; - analyse the critical points in animals identification and carcass sides evaluation.

Material and methods - The study was carried out in an authorised cattle slaughterhouse in North-West of Italy (Cuneo district) processing 100-300 heads every day (about 30 heads/hour), col-

Table 1. Frequency distribution of animal age (months), animal live weight (kg), carcass weight (kg) and dressing percentage (%) at slaughter.

Animal age (months)	N	%	Animal live weight (kg)	N	%	Carcass weight (kg)	N	%	Dressing percentage (%)	N	%
<1	4	0.01	<50	8	0.02	<50	28	0.06	<10	15	0.03
1-6	587	1.19	50-100	41	0.08	50-100	159	0.32	10-20	17	0.03
6-12	7,464	15.08	100-200	159	0.32	100-150	2,919	5.90	20-30	122	0.25
12-18	16,034	32.40	200-300	5,694	11.51	150-200	5,174	10.46	30-40	1,079	2.18
18-24	12,061	24.37	300-400	2,967	6.00	200-250	5,605	11.33	40-50	6,605	13.35
24-36	1,970	3.98	400-500	5,234	10.58	250-300	6,659	13.46	50-60	15,694	31.71
36-48	1,674	3.38	500-600	13,570	27.42	300-350	6,171	12.47	60-70	19,201	38.80
48-60	1,957	3.95	600-700	15,981	32.29	350-400	7,409	14.97	70-80	5,599	11.31
60-72	1,687	3.41	700-800	4,886	9.87	400-450	8,928	18.04	>80	1,147	2.32
72-84	1,357	2.74	800-900	770	1.56	450-500	4,721	9.45			
84-96	1,130	2.28	900-1000	71	0.14	500-550	1,385	2.80			
96-108	827	1.67	1000-1100	39	0.08	550-600	294	0.59			
108-120	726	1.47	1100-1200	5	0.01	>600	40	0.08			
>120	2,008	4.06	>1200	61	0.12						

lecting data on animals and carcasses. In the slaughterhouse data collection starts when animals enter in the slaughtering chain, registering - before stunning - owner, identification number, genetic type, sex, birth date (to obtain age), live weight, and at the end of the chain - before cooling - side weight (to obtain carcass weight and dressing percentage), carcass classification (category, conformation, and fatness).

For this study, one year records on 49,486 animals were collected before data were daily checked by slaughterhouse staff to rectify registering errors before their official processing. All data on animals (genetic type, age, sex, and live weight) and carcasses (weight, dressing percentage, category, conformation, and fatness) were analysed in detail (mean, minimum and maximum value, and/or frequency distribution) to verify their adequacy and to highlight mistakes in registration, to improve the performance of the technical staff.

Results and conclusions - The genetic type mostly represented was Limousine (21.25 %), followed by Italian Friesian (19.74 %), Piemontese (18.62 %), French Crosses (12.20 %), Italian Crosses (8.06 %), Charolais (6.29 %), Blonde d'Aquitaine – Garonnaise (4.82 %), Aosta Red Pied (1.50 %), Aosta Chestnut (1.11 %), and finally others 38 (6.41 %). Regarding sex of animals, more males (59.76 %) than females (40.24 %) were slaughtered.

For animals age (months), live and carcass weight (kg) and dressing percentage (%) means, minimum and maximum values were calculated. The results showed the presence of several mistakes in typing data, as all the minimum and maximum values were both impossible or improbable. So for animal age even if it was found a mean value of 31.5 months, the minimum value is impossible (-224 months, surely due to a

mistake in typing birth year) and the maximum seems be quite improbable (274 months, more than 22 years). For animal live weight and carcass weight, again, the mean values could be acceptable (538.9 and 325.5 kg, respectively), but both minimum (5 and 17 kg, respectively) and maximum one (6,260 and 875 kg, respectively) are impossible and probably due to mistakes in typing the real amount (lack of one or more of the digits or doubling of one digits or failure to enter the comma in the number). The mistakes observed both in live and carcass weight influenced also the minimum and maximum values of dressing percentage (6 and 6,876 %, respectively), while the mean value (61.4 %) is credible.

To better understand the mistakes occurred in the first step of data collection at the slaughterhouse, could be useful to analyse the frequency distribution, reported in Table 1 for animal age (months), animal live weight (kg), carcass weight (kg) and dressing percentage (%) at slaughter. For animal age about the 1.20 % should be wrong by default (< 6 months) and the 4.06 % for excess (> 120 months), for animal live weight about the 0.10 % should be wrong by default (< 100 kg) and the 0.35 % for excess (> 900 kg), for carcass weight about the 0.38 % should be wrong by default (< 100 kg) and the 3.47 % for excess (> 500 kg), for dressing percentage about the 15.84 % should be wrong by default (< 50 %) and the 13.63 % for excess (> 70 %). The higher amount of wrong data was found in dressing percentage, probably due to the sum of mistakes in live and carcass weight.

For carcasses classification - including category, conformation, and fatness according to EU rules - only the frequency distribution was studied. As showed in table 2, almost half of slaughtered animals were uncastrated young males (A, < 24 months of age), followed by cows (D, female animals that have calved), veal calves (V, < 8 months of age), and other females (E, other female animals). Concerning conformation very few carcasses were graded as S (superior - profiles extremely convex), even if the amount of Piemontese males (supposed to present muscular hypertrophy and so to be evaluated S) was higher, probably for the severity of the evaluators. Much more were graded as E (beef males), U (beef cows) and P (Friesian cows). For fatness, in agreement with the demands of local market, almost all carcasses were evaluated 2 (slight), and no ones 4 (high) and 5 (very high).

Table 2. Frequency distribution of carcasses classification (category, conformation, fatness) at slaughter.

Category	N	%	Conformation	N	%	Fatness	N	%
A	22,991	46.46	S	1,592	3.22	1	4,171	8.43
B	263	0.53	E	14,310	28.92	2	42,729	86.35
C	59	0.12	U	18,989	38.37	3	2,586	5.23
D	12,218	24.69	R	3,125	6.31	4	0	0.00
E	6,451	13.04	O	2,489	5.03	5	0	0.00
V	7,504	15.16	P	8,981	18.15			

The results obtained in this study confirm the need to improve data collection when the animals enter in the slaughtering chain, especially those regarding birth date and live weight, while at the end of the chain attention should be paid to side weight registration, especially for veal calves carcasses (not dissected into sides). Anyway, if the results of paying more attention should be to slow the processing line it could be better to check the data before their official processing. Another solution could be the adoption of an automatic system for animal and side weighting, in order to reduce errors and avoid wasting time.