

LINEAR MEASUREMENTS OF CARCASSES AS A TOOL TO IMPROVE THE EVALUATION OF THE RABBIT MEAT PRODUCTION

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ABSTRACT

In order to improve the methodologies for objective evaluation of rabbit meat production a series of linear measurements have been carried out on rabbit carcasses, integrated by the carcass commercial traits usually evaluated at slaughter. Ninety-six crossbred rabbits (New Zealand White x Californian) were weaned at 28 d (LW 493±63 g), slaughtered at 77 d (LW 2167±157 g) and carcasses prepared by removing blood, skin, distal legs, urinary bladder and gastrointestinal tract. The average dressing out percentage (59.7±8.1%) was calculated. Carcasses were then refrigerated at 2°C for 24 h and average cold carcass weight (CCW) 24 h after slaughter resulted 1179±96 g. Head, lungs, thymus gland, trachea, heart and liver were removed and the conformation, fatness and colour of carcasses was classified, by visual examination, using a scale of 5 ± scores. Averages of some linear measurements effectuated on cold carcasses resulted: body length 32.8±1.0 cm, loin width 12.4±0.7 cm, chest width 9.0±0.4 cm, carcass length 26.9±1.0 cm, chest depth 6.5±0.6 cm and leg length 16.5±0.8. Carcasses were then dissected to measure fat content and muscle to bone ratio. The average coefficients of correlation (r) calculated between the linear measurements and the dressing out percentage of carcasses resulted: body length 0.659; loin width – 0.063; chest width 0.347; carcass length 0.633; chest depth 0.844; and leg length 0.392. The main linear measurements of carcasses could represent an additional tool for supporting the evaluation of rabbit meat production.

Key words: rabbit, carcass measurements, meat production.

INTRODUCTION

As for other livestock, rabbit meat products can be evaluated according to carcass and meat quality. Carcass quality has to satisfy economic objectives, such as saleable meat yield and attractiveness to consumer (DALLE ZOTTE *et al.*, 2002). Many researches have been conducted in order to evaluate rabbit carcass quality mainly concerning carcass weight (COLIN, 1999), slaughter yield, referred as whole carcass (MILISITS *et al.*, 2000), or

retail cuts yield (PARIGI BINI *et al.*, 1992); meatiness, referred as meat to bone ratio of the reference carcass (PARIGI BINI *et al.*, 1992); or that of hindleg (DAL BOSCO *et al.*, 2000); fatness, expressed as percentage of dissectible fat (DALLE ZOTTE and OUHAYOUN, 1998), and chilling losses (DAL BOSCO *et al.*, 2000). The objective of the present study was to provide some experimental data on new methodologies for objective evaluation of rabbit meat production. Therefore mean linear measurements have been effectuated on rabbit carcasses in addition to the commercial traits usually evaluated, since no investigations have so far been undertaken in this direction as ascertained from recent rabbit literature.

MATERIALS AND METHODS

Animals

The trial was carried out on ninety-six crossbred rabbits (New Zealand White x Californian). Rabbits were weaned at 28 days performing an average live weight of 493 ± 63 g. After weaning, all experimental animals were fed *ad libitum* a commercial pelleted feed (16.5% protein, 2520 kcal/kg ME) and given free access to water. They were housed in pairs in a cage kept in a room with artificial ventilation and a 16h light-8h dark schedule. Rabbits were all slaughtered on the same day at 77 days of age. Care and use of animals were performed in accordance with the guidelines established by the European Community (no. 86/609/CEE) and approved by the Italian Ministry of Health (L. n. 116/92) regarding animal treatment and commercial slaughtering.

Carcass measurements

Immediately prior slaughter all experimental rabbits live weights (LW) were recorded. The rabbits were rendered unconscious by electric stunning and killed by exsanguinations. Blood was removed and the net live weight (NLW) was individually calculated subtracting the blood weight from the LW values. The carcasses were prepared by removing skin, distal legs, genital organs, urinary bladder and gastrointestinal tract (BLASCO *et al.*, 1993). Hot carcasses were weighted (HCW) and dressing out percentage (DP) calculated. After refrigeration at 2°C for 24 h cold carcasses weights (CCW) were recorded and ultimate pH (pH_u) measured. Head, lungs, thymus gland, trachea, heart, liver and kidneys were removed and carcasses were classified, by visual examination, using a scale of 5 \pm scores for the conformation, fatness and colour of carcasses (A.S.P.A., 1991 with our adaptation). The main linear measurements were also effectuated on cold carcasses hanging from a 18 cm wide hook peculiar to maintain carcass hind legs 18 cm wide: body length, loin width, chest width, carcass length, chest depth and leg length. Carcasses were then dissected to measure fat content and muscle to bone ratio (M/B) (PARIGI BINI *et al.*, 1992).

RESULTS AND DISCUSSION

Main commercial characteristics of experimental rabbits carcasses at slaughter are reported in Table 1. Data appear to be in agreement with other researches carried out on

rabbits slaughtered at the same age (PARIGI BINI *et al.*,1992; BERNARDINI BATTAGLINI *et al.*,1994).

Table 1. Commercial traits of carcasses. Means \pm s.d.

Rabbits (n.)	96
Live weight (LW) (g)	2167 \pm 157
Net live weight (NLW) (g)	2102 \pm 110
Hot carcass weight (HCW) (g)	1294 \pm 98
Cold carcass weight (CCW) (g)	1179 \pm 96
pH _u	6.08 \pm 0.16
Dressing out percentage (DP) (%)	59.7 \pm 8.1
Incidence (%) on NLW:	
Carcass	61.6 \pm 8.1
Head	5.2 \pm 0.14
Skin	13.1 \pm 2.01
Distal legs with skin	6.9 \pm 0.32
Lungs, thymus and trachea + heart	3.0 \pm 0.02
Empty gastrointestinal tract	5.4 \pm 0.15
Gastrointestinal fat	0.9 \pm 0.01
Blood	2.9 \pm 0.02
Genitals + losses	1.1 \pm 0.01

Data concerning carcass conformation using a 5 \pm scores evaluation scale are presented in Table 2.

Table 2. Classification of carcass conformation

Scores	Rabbits %
1 ⁺	0
2 ⁺	82.3
3 ⁺	13.7
4 ⁺	0
5 ⁺	0

Carcass conformation of experimental rabbits resulted quite good also from a commercial point of view, considering that 82.3 % of carcasses was scored 2 \pm .

Table 3 resumes main characteristics at dissection and meat to bone ratio of carcasses. Resulting data appear in agreement with other studies considering similar carcass traits (PLA *et al.*, 1998; PARIGI BINI *et al.*, 1992)

Table 3. Average composition (%) and meat to bone ratio (M/B) of carcasses

Carcass composition	%
Fat	4.3
Muscle	84.4
Bone	11.3
M/B	7.54

In Table 4 are presented the linear measurements of rabbit carcasses. The values obtained in the present survey appear in disagreement with other researches (LUKEFAHR and OZIMBA, 1991; BATTAGLINI *et al.*, 1993). Nevertheless the mentioned studies report some linear measurement effectuated *in vivo* and at different ages.

Table 4. Linear measurements of carcasses (cm). Means \pm s.d.

Rabbits (n.)	96
Body length	32.8 \pm 1.0
Loin width	12.4 \pm 0.7
Chest width	9.0 \pm 0.4
Carcass length	26.9 \pm 1.0
Chest depth	6.5 \pm 0.6
Hindleg length	16.5 \pm 0.8

Table 5 shows the average coefficients of correlation between linear measurements and dressing out percentage of carcasses. The closest coefficient of correlation ($r=0.844$) resulted between the chest depth and the dressing out percentage of carcasses.

Table 5. Average coefficients of correlation (r) between linear measurements and dressing out percentage of carcasses

Linear measurements	(r)	Dressing out percentage
Body length		0.659
Loin width		-0.063
Chest width		0.347
Carcass length		0.633
Chest depth		0.844
Hindleg length		0.392

CONCLUSIONS

The main linear measurements of carcasses could represent an additional tool to support the evaluation of the rabbit meat production. However, further investigations are needed in order to furnish a significant interpretation of the linear measurements of rabbit carcasses and their correlations with the main commercial traits.

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