

THE EFFECT OF LIVE WEIGHT ON THE CARCASS TRAITS OF RABBITS BETWEEN 2.2 AND 3.5 KG

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Abstract - For 267 Pannon White growing rabbits of both sexes slaughtered at a body weight of 2.2-2.4, 2.4-2.6, 2.6-2.8, 2.8-3.0, 3.0-3.2, 3.2-3.4 and 3.4-3.5 kg, the average dressing percentage was 59.5, 60.7, 61.9, 62.2, 61.4, 62.4 and 62.1 %, respectively. While the weight of live animals increased by about 50 % between 2.29 and 3.42 kg the weight change of blood (23 %), full gastrointestinal tract (26 %) and head (35 %) were the lowest, whereas the intermediate part (65 %), liver (72 %), skin (73 %), meat on hind legs (74 %), meat on the intermediate part (85 %) and perirenal fat (325 %) gained the most rapidly.

INTRODUCTION

To improve the quality of our exports of rabbit we need to increase dressing percentage and proportion of valuable body parts of growing rabbits. Slaughter value varies according to breed, nutrition, keeping conditions, body weight and some less important factors (RUDOLPH, 1988). The effect of age and body weight on carcass traits has been analysed by SCHLOLAUT (1977), RAO et al. (1978), RUDOLPH and FISCHER (1979), VAREWYCK and BOUQUET (1982), MÖSCH et al. (1984), RISTIC (1988), PETERSEN et al. (1988), MAERTENS and De GROOTE (1992), RISTIC and ZIMMERMANN (1992). According to investigations by SZENDRŐ (1989), dressing percentage is not affected by age if rabbits are slaughtered at the same body weight, so it is the effect of body weight that dominates even in the case of slaughter at different ages.

It is difficult to compare research findings published in different sources of literature because results of trial slaughter refer to rabbits killed at different weights (ages) and by different methods. Such results are mainly suitable for drawing some general conclusions from them. BLASCO et al. (1993) have developed and recommend a uniform method of slaughter to eliminate the difficulties mentioned. In our experiment we used this method to investigate the slaughter value of Pannon White growing rabbits. The goal of the experiment was to examine the effect of live weight on carcass traits of Pannon White rabbits between 2.2 and 3.5 kg.

MATERIAL AND METHODS

The investigation was carried out at the Pannon Agricultural University using Pannon White rabbits.

The experimental animals were weaned at the age of 6 weeks. They were kept at the place of birth until slaughter. They were housed in flat-deck wire cages (5-6 rabbits per cage). The animals were fed commercial pellet ad libitum (CP: 16.5 %, CF: 15.5 %). Drinking water was available continuously from self-drinkers.

The growing rabbits were killed after 24 hours of fasting. Body weight before fasting and after fasting, weight loss, blood, commercial skin, extremities, head, full gastrointestinal tract, edible offal (liver, kidneys, heart, lungs, perirenal fat), carcass (hot carcass minus head and edible offal) fore, intermediate and hind part of the carcass (cut points between 7th and 8th ribs and dorsal vertebrae and between 6th and 7th lumbar vertebrae, in the line of the thighs), hind leg (hind part without backbone) and meat covering the intermediate part and hind legs (filleted with a knife) were measured. Then rations of single body parts were calculated. After slaughter, rabbits were grouped according to body weight before fasting into classes in graduations of 0.2 kg.

RESULTS AND DISCUSSION

Weight averages for each body part are summarized in Table 1. Body weight measured before fasting increased by about 50 % during the period investigated. Compared to this, there were body parts showing a growth rate below average, average and above average. Increase in body weight measured after 24 hours of fasting, weight loss during 24 hours, kidneys+heart+lung w, fore part w and hind part w showed around average figures (45-55 %). Head w, extremities w, full gastrointestinal tract w and hind legs w were below average (23-35 %),

while hot carcass w (56 %), skin w, liver w, intermediate part w and weight of meat on hind legs and intermediate part (65-79 %) and perirenal fat (326 %) were above average.

The full gastrointestinal tract should be highlighted here, since its growth of 26 % falls far below average. Similarly to reports by OUHAYOUN (1984) stating that the allometric coefficient of the digestive tract changes drastically (from 1.13 to 0.46) at 650 g of body weight, DELTORO and LOPEZ (1985) also detected a decrease to a similar extent, i.e. from 1.36 to 0.57 at the age of 6-7 weeks. As far as proportion of the digestive tract is concerned, a definite decrease was described by LEBAS (1975), RAO et al. (1978), PETERSEN et al. (1988), SZENDRÓ (1989), PARIGI-BINI et al. (1992). This fact is definitely encouraging from the viewpoint of dressing percentage. Similarly, the declining proportion of head is also favourable, and is also supported by some other publications (RAO et al., 1978; SZENDRÓ, 1989).

The main advantages are that the weight of carcass, intermediate part and meat on hind leg showed an above average increase (56, 65 and 74 %, respectively.)

Of the body parts growing at a rate above average, growth of perirenal fat (326 %) is the most remarkable. The fat content of rabbit meat of high body weight does not change markedly (PARIGI-BINI et al., 1992; SZENDRÓ et al., 1995). On the contrary the perirenal and scapular fat deposits increase abruptly with age. A rate of increase more than twice as great as the previous data has been observed by PRUD'HON et al. (1970) after 106 days of age, RUDOLPH et al. (1986) at 57 and 85 days of age, OUHAYOUN (1984) above 950 g and 2,100 g body weight and ROMVÁRI et al. (1993) above 2,500 g body weight. This change is unfavourable from the viewpoint of carcass quality.

Ratios of single body parts are shown in Table 2. The average dressing percentage calculated based on hot carcass weight only was 51.3 %. The values received when head and head + edible offal were also included proved to be greater by 5.6 % and 10.4 % (i.e. 56.9 % and 61.7 %), respectively. As compared to body weight measured after 24 hours of fasting, the proportion of the less valuable fore part proved to be 15.3 %, while that of the hind part (containing the most meat) was the highest (19.1 %). The proportion of the most valuable parts (intermediate and hind parts, together) amounted to 68.7 % within the carcass. It is difficult to compare objectively these data to those available in literature, because of the different methods of slaughter and calculation used. Nevertheless, these can without doubt be declared good performance results.

The proportion of single body parts does not increase parallel to body weight before fasting (Table 2). The lowest value was found in the 2.2-2.4 kg category, while the highest was usually detected in categories between 3.2-3.4 kg. With heavier rabbits (3.4-3.5 kg), however, a slightly declining tendency was observed.

Most authors (VAREWYCK and BOUQUET, 1982; MÖSCH et al., 1984; RISTIC et al., 1988; PETERSEN et al., 1988; SZENDRÓ, 1989) agree that, in the case of growing rabbits, carcass yield improves considerably with age. However, as stated by RUDOLPH and FISCHER (1979), RAO et al. (1978), PARIGI-BINI et al. (1992), the differences between groups become smaller in larger body weight categories. DELTORO and LOPEZ (1986) did not detect any significant changes from the age of 11 weeks (up to 20 weeks of age); in fact, dressing percentage even decreased during some weeks. As a further difficulty, reference should be made to changes in certain parts of the carcass. DELTORO and LOPEZ (1986) observed that while the proportion of the fore quarters (without extremities) within the carcass decreases steadily until the age of 5 weeks, and increases to a lesser extent later on, the proportions of the intermediate part and hind legs increase significantly until the age of 14 and 15 weeks, respectively, and remain unchanged later on. These can be an explanation for the fact that fore, intermediate and hind parts reach their maximum proportion within the carcass at different body weights.

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Einfluß des Körpergewichtes auf den Schlachtwert von Kaninchen - 267 Weiße Pannon Jungkaninchen beiderlei Geschlechts wurden in den Gewichtsklassen 2.2-2.4, 2.4-2.6, 2.6-2.8, 2.8-3.0, 3.0-3.2, 3.2-3.4, 3.4-3.5 kg geschlachtet. Die durchschnittliche Schlachtausbeute in dieser Reihenfolge war 59.5, 60.7, 61.9, 62.2, 61.4, 62.4, 62.1 %. Bei einer ca. 50 % igen Gewichtszunahme von 2.29 auf 3.42 kg veränderten sich Blut (23 %), Magen-Darm-Trakt (26 %) und Kopf (35 %) am wenigsten; wohingegen Rumpf (65 %), Leber (72 %), Haut (73 %), das Muskelfleisch an Keulen (74 %) und Rumpf (85 %) sowie das Nierenfett (325 %) am schnellsten zunahmen.

Table 1: The effect of live weight on carcass traits of Pannon White rabbits

| | Carcass traits | Live weight, kg | | | | | | | | | | | | | | Overall | | Difference between 2.29 and 3.42 kg | |
|-----|--|-----------------|-----|-----------|-----|-----------|------|-----------|-----|-----------|------|-----------|------|-----------|------|---------|------|-------------------------------------|-----|
| | | 2.20--2.39 | | 2.40-2.59 | | 2.60-2.79 | | 2.80-2.99 | | 3.00-3.19 | | 3.20-3.39 | | 3.40-3.49 | | | | g | % |
| | | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | | |
| 1. | No. of rabbits | 19 | | 23 | | 73 | | 78 | | 42 | | 20 | | 12 | | 267 | | | |
| | Live weight, g (before fasting) | 2288 | 45 | 2508 | 57 | 2723 | 55 | 2878 | 55 | 3065 | 59 | 3382 | 51 | 3424 | 27 | 2846 | 279 | 1135 | 58 |
| | Weight loss, g (during 24h fasting) | 135 | | 153 | | 197 | | 199 | | 188 | | 201 | | 209 | | 187 | | 60 | |
| 4. | Live weight, g (after 24h fasting) | 2153 | 98 | 2355 | 74 | 2526 | 78 | 2679 | 80 | 2877 | 89 | 3181 | 64 | 3223 | 66 | 2662 | 272 | 1070 | 50 |
| 5. | Skin weight, g | 385 | 22 | 347 | 25 | 404 | 29 | 425 | 33 | 469 | 44 | 510 | 39 | 527 | 31 | 421 | 64 | 222 | 73 |
| 6. | Head weight, g | 121 | 9 | 132 | 9 | 143 | 13 | 148 | 9 | 156 | 10 | 158 | 9 | 163 | 8 | 146 | 14 | 42 | 35 |
| 7. | Distal part of legs w, g | 78 | 8 | 83 | 8 | 85 | 9 | 91 | 7 | 98 | 8 | 98 | 7 | 1410 | 6 | 90 | 111 | 21 | 27 |
| 8. | Full gastrointestinal tract w, g | 350 | 48 | 356 | 38 | 372 | 48 | 379 | 38 | 401 | 41 | 419 | 32 | 440 | 43 | 382 | 47 | 90 | 25 |
| 9. | Blood w, g | 82 | 32 | 82 | 28 | 75 | 15 | 82 | 28 | 84 | 16 | 88 | 16 | 101 | 14 | 82 | 23 | 19 | 23 |
| 10. | Hot carcass w, g (without head and edible parts) | 1065 | 64 | 1192 | 47 | 1299 | 67 | 1387 | 44 | 1480 | 66 | 1618 | 43 | 1663 | 62 | 1367 | 156 | 5% | 56 |
| 11. | Liver w, g | ⁵⁰³ | 6.3 | 52.8 | 6.7 | 58.5 | 7.4 | 63.5 | 6.4 | 67.5 | 93 | 74.3 | 6.7 | 863 | 9.3 | 62.7 | 10.8 | 36.0 | 72 |
| 12. | Kidneys+heart+lung w,g | 35.8 | 4.7 | 36.7 | 4.8 | 40.1 | 4.8 | 42.4 | 53 | 483 | 7.0 | 47.0 | 5.2 | 51.3 | 4.8 | 423 | 6.8 | 16.3 | 47 |
| 13. | Perirenal fat w, g | 119 | 3.6 | 14.3 | 5.5 | 21.8 | 10.5 | 23.6 | 8.0 | 26.3 | 10.7 | 36.5 | 11.4 | 37.9 | 17.6 | 23.2 | 11.7 | 21.8 | 326 |
| 14. | Carcass+head w, g | 1186 | 68 | 1325 | 47 | 1443 | 75 | 1535 | 46 | UM | 68 | 1776 | 46 | 1826 | 64 | 1513 | 167 | 640 | 54 |
| 15. | Carcass+edible parts w, g | 1159 | 61 | 1297 | 47 | 1420 | 70 | 1516 | 44 | 1622 | 70 | 1776 | 50 | 1838 | 62 | 1495 | 174 | 679 | 59 |
| 16. | Carcass+head+edible parts w, g | 1280 | 65 | 1438 | 47 | 1563 | 77 | 1664 | 46 | 1777 | 71 | 1934 | 51 | 2802 | 63 | 1642 | 185 | 721 | 56 |
| 17. | Fore part w, g | 323 | 24 | 349 | 15 | 387 | 23 | 414 | 18 | 444 | 25 | 405 | 21 | 505 | 22 | 409 | 50 | 182 | 56 |
| 18. | Intermediate part, g | 323 | 35 | 373 | 22 | 408 | 29 | 438 | 23 | 470 | 27 | 520 | 28 | 533 | 23 | 431 | 57 | 210 | 65 |
| 19. | Hind part w, g | 400 | 26 | 443 | 25 | 484 | 32 | 517 | 21 | 547 | 33 | 597 | 24 | 610 | 36 | 508 | 59 | 210 | 52 |
| 20. | Intermediate+hind part w, g | 723 | 55 | 816 | 41 | 892 | 56 | 955 | 37 | 1816 | 53 | 1117 | 40 | 1143 | 55 | 939 | 113 | 420 | 58 |
| 21. | Hind legs w, g | 374 | 23 | 416 | 23 | 458 | 30 | 487 | 20 | 485 | 68 | 490 | 99 | 504 | 104 | 40 | 59 | 130 | 35 |
| 22. | Meat on intermediate part, g | 215 | 26 | 251 | 18 | 274 | 28 | 2% | 23 | 335 | 45 | 384 | 47 | 397 | 46 | 297 | 55 | 182 | 85 |
| 23. | Meat on hind legs, g | 280 | 24 | 311 | 21 | 342 | 25 | 365 | 18 | 412 | 59 | 477 | 69 | 485 | 73 | 369 | 65 | 286 | 74 |
| | Meat on intermediate part+hind legs, g | 494 | 46 | 562 | 35 | 616 | 46 | 660 | 36 | 747 | 1101 | 861 | 114 | 882 | 118 | 118 | 118 | 388 | 79 |

Table 2 : The effect of live weight on carcass traits of Pannon White rabbits

| Carcass traits | | Live weight, kg | | | | | | | | | | | | | | Overall | | Difference between 2.29 and 3.42 kg % |
|----------------|--|-----------------|-----|-----------|-----|-----------|-----|-------------|-----|-----------|-----|-------------|------|-------------|-----|-------------|-----|---------------------------------------|
| | | 2.20-139 | | 2.40-2.59 | | 2.60-2.79 | | 2.80-2.99 | | 3.00-3.19 | | 3.20-3.39 | | 3.40-3.49 | | | | |
| | | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| 25. | Dressing percentage, % (without head and 3edible parts, 10/4x100) | 49.5 | 1.5 | 50.6 | 1.5 | 51.4. | 1.9 | 51.8 | 1.5 | 51.1 | 2.8 | <u>52.2</u> | 0.9 | 51.6 | 1.7 | 51.3 | 2.0 | 2.1 |
| 26. | Dressing percentage, % (with head, without edible parts, 14/4x100) | 55.1 | 2.0 | 56.3 | 1.4 | 57.1 | 2.1 | 57.3 | 1.7 | 56.5 | 3.1 | <u>57.3</u> | 0.9 | 56.7 | 1.8 | 56.9 | 2.1 | 1.6 |
| 27. | Dressing percentage, % (without head, with edible parts, 15/4x100) | 53.9 | 1.9 | 55.1 | 1.5 | 56.2 | 1.9 | 56.6 | 1.5 | 56.0 | 2.9 | <u>57.3</u> | 1.0 | 57.0 | 1.6 | 56.2 | 2.1 | 3.2 |
| 28. | Dressing percentage, % (with head and edible parts, 16/4x100) | 59.5 | 1.9 | 60.7 | 1.4 | 61.9 | 2.1 | 62.2 | 1.7 | 61.4 | 3.2 | <u>62.4</u> | 1.01 | 62.1 | 1.6 | 61.7 | 2.2 | 2.6 |
| 29. | Ratio of fore part in live weight (LW), 17/4x100), % | 15.0 | 0.9 | 14.8 | 0.7 | 15.3 | 0.7 | 15.5 | 0.7 | 15.3 | 0.9 | 15.6 | 0.5 | <u>15.7</u> | 0.6 | 15.3 | 0.8 | 0.7 |
| 30. | Ratio of intermediate part in LW (18/4x100) | 15.0 | 1.3 | 15.9 | 0.8 | 16.1 | 0.9 | 16.4 | 0.8 | 16.2 | 1.1 | <u>16.8</u> | 0.9 | 16.5 | 0.7 | 16.2 | 1.0 | 1.5 |
| 31. | Ratio of hind part in LW (19/4x100), % | 18.6 | 0.8 | 18.8 | 0.8 | 19.2 | 1.0 | 19.3 | 0.8 | 18.9 | 1.3 | <u>19.3</u> | 0.7 | 18.9 | 1.0 | 19.1 | 1.0 | 0.4 |
| 32. | Ratio of intermediate+hind part in LW (20/4x100), % | 33.6 | 1.8 | 34.6 | 1.4 | 35.3 | 1.7 | 35.7 | 1.3 | 35.1 | 2.2 | <u>36.0</u> | 1.1 | 35.5 | 1.5 | 35.3 | 1.7 | 1.9 |
| 33. | Ratio of fore part in carcass (17/10x100), % | 30.3 | 2.1 | 29.2 | 1.1 | 29.8 | 1.1 | 29.9 | 1.0 | 30.0 | 1.0 | 30.0 | 1.0 | <u>30.4</u> | 1.0 | 29.9 | 1.2 | 0.0 |
| 34. | Ratio of intermediate part in carcass (18/10x100), % | 30.3 | 1.9 | 31.3 | 1.2 | 31.3 | 1.2 | 31.6 | 1.1 | 31.7 | 1.2 | 32.1 | 1.4 | 32.1 | 0.9 | 31.5 | 1.3 | 1.8 |
| 35. | Ratio of hind part in carcass (19/10x100), % | 37.5 | 1.2 | 37.1 | 1.2 | 37.2 | 1.2 | <u>37.3</u> | 1.1 | 36.9 | 1.1 | 36.9 | 1.1 | 36.7 | 1.0 | 37.2 | 1.1 | -1.9 |
| 36. | Ratio of intermediate + hind part in carcass (20/10x100), % | 67.9 | 1.8 | 68.4 | 1.6 | 68.6 | 1.3 | 68.9 | 1.2 | 68.7 | 1.2 | <u>69.0</u> | 1.4 | 68.7 | 1.2 | 68.7 | 1.3 | 0.9 |
| 37. | Ratio of hind legs in carcass (21/10x100), % | 35.1 | 1.0 | 34.9 | 1.2 | 35.2 | 1.1 | <u>35.2</u> | 1.0 | 32.9 | 4.8 | 30.3 | 6.0 | 30.3 | 6.1 | 34.2 | 3.3 | -4.8 |
| 38. | Ratio of meat on intermediate part in carcass (22/10x100), % | 20.2 | 1.3 | 21.1 | 1.3 | 21.1 | 1.4 | 21.3 | 1.2 | 22.6 | 2.6 | 23.7 | 3.1 | <u>23.9</u> | 2.9 | 21.7 | 1.8 | 3.7 |
| 39. | Ratio of meat on hind legs in carcass (23/10x100), % | 26.3 | 1.5 | 26.1 | 1.6 | 26.3 | 1.5 | 26.3 | 1.5 | 27.8 | 2.9 | <u>29.5</u> | 3.6 | 29.2 | 3.2 | 27.0 | 2.0 | 2.9 |
| 40. | Ratio of meat on intermediate part+hind legs in carcass (24/10x100), % | 46.4 | 2.1 | 47.1 | 1.7 | 47.4 | 2.0 | 47.6 | 1.7 | 50.4 | 5.0 | <u>53.2</u> | 7.0 | 53.0 | 6.5 | 48.5 | 4.0 | 6.6 |

Observation : the highest values are underlined