

FEEDING GROWING FLEMISH GIANT RABBITS

III.—Carcass Quality, Dressing Percentage and The Nutritive Analysis of The Edible Flesh

By

A.K. ABOU-RAYA, M.A. RAAFAT, M.R. ABBADY, AND S.M. TOUNY

Dept. Animal Production (Animal Nutrition)

Faculty of Agric., Cairo University

SUMMARY

The slaughter study and nutritive analysis of the total edible flesh with 7 male Flemish giant rabbits were undertaken at the age of 15 and 18 weeks. The live weight ranged between 1.483 and 2.296 kg. The average of the blood, skin and drawn weight as percentage from live weight was 3.34, 14.23 and 60.07 respectively. The total edible flesh was 75% of the drawn weight, the bones being 25%. The average nutritive analysis of the total edible flesh was 72.56% moisture, 19.77% protein, 6.25% fat, 1.31% ash and 0.11% carbohydrates. The physiological fuel value was 1357 calories per kg. edible flesh.

INTRODUCTION

Rabbits have the advantage of producing meat in a short time using relatively cheap rations, roughages and are-products not consumed by mankind. Therefore, their meat is produced relatively cheaper than the meat of other farm animals and at the same time it possesses nearly the same calorific values as beefs meat (6).

Indeed in a country like ours, attention should be more directed to full utilization of rabbits for meat production. This would share in solving the problem of meat shortage in U.A.R. providing a relatively cheap source of meat for the workers and farmers who are the majority of population.

Foreign breeds of rabbits, having bigger sizes than our native breeds were introduced, in order to make more available a relatively cheap source of animal protein for human consumption. Accordingly, it appears necessary to study the carcass quality, dressing percentage and chemical analysis of some Flemish Giant rabbits as an example of foreign breeds. This will provide some basic knowledge necessary for evaluating and fixing the prices of different edible parts. Moreover, the chemical analysis of the edible parts would be a guide for human dietetics.

Templeton (10) found that, young rabbits weighing 1.5-3 kg. yield dressed carcass of 1.1-1.5 kg. of which nearly 77% is edible. Older rabbits (more than 90 days old) weighing 5 kg. provide carcass of 3-3½ kg. He found practically no differences in weight between the cuts from bucks and does weighing 3 kg.

Davis (2) recorded the dressing percentage for various parts of a table rabbits of 3-3.5 kg. live weight. He found that the percentage of edible parts (flesh, bones and fat) was 60-64% of live weight. The percentage of bones was 9-10%.

Fangouf and Dreyer (3) concluded that the small breeds of rabbits have better carcass yield than large breeds and that the relative yield of organs was approximately the same in all breeds.

Khishin *et al* (5) using Giza white and Boskat rabbits, found that at the age of 24 weeks each of shoulders plus thorax, or pelvis plus legs was about 37% of the dressed carcass, while the loin was about 23%.

Mahmoud (7) found that the average body and carcass weights of Giza white rabbits, at the age of 90 days, were 1405.8 and 685.8 gm. respectively.

Regarding the composition of rabbits meat, Haring and Gruhu (4) found that fat percentage in the whole carcass in three breeds of rabbits ranged between 4.8 and 10.8 while Romanovskii found it ranging between 8-19% in rabbits meat (9). He recorded that rabbits meat contained 21.47% protein. Mahmoud (7) found that the percentage of carcass, water and ash decreased gradually with age while the carcass protein was nearly constant at the different ages.

The following study dealt with the carcass quality and dressing percentage of Flemish giant rabbits fed on different rations at two ages. Moreover, the nutritive analysis of the total edible flesh (containing fat) was undertaken along with the calculation of the calorific value of the flesh. This would fill a gap in our knowledge with this breed under local conditions at Giza.

Such information is useful for marketing Flemish giant rabbits and for human dietetics. This was a completion of the previous work on feeding growing Flemish giant rabbits.

EXPERIMENTAL AND METHODS

One rabbit (buck) was chosen at random from each group of 7-8 rabbits fed on different diets in previous growth experiments as shown in the following table :

The starch value of the clover used was 10 and that of the concentrates was 70.

Groups	Age when slaughtered	Distribution of starch value in the ration
	week	
1	15	100% clover only.
2	15	33% clover + 67% concentrates.
3	15	50% clover + 50% concentrates.
4	18	100% clover only.
5	18	33% clover + 67% concentrates.
6	18	50% clover + 50% concentrates.
7	18	100% concentrates only.

Preparing the rabbit for slaughter and dressing

Before slaughter rabbits were kept without food for 18 hours. Water was only offered *ad. lib.* Animals were weighed then slaughtered by cutting the neck and jugular veins by a sharp knife. After draining out the blood the body was weighed. The rabbit was dressed out from the skin rapidly; the tail and end of legs were included within the skin. The remained body was weighed to determine the dressed weight.

The total inedible parts, including the viscera, lungs, skin, end of legs and tail, were weighed alone.

The remaining carcass (main body and head) along with the edible organs (liver, kidneys and heart) were weighed to determine the "drawn weight" which includes the "total edible parts".

The "main body" includes the front parts, hind parts along with the loin, chest and neck. This is usually offered for the table.

This division was similar to that published by Miller (8). The head was considered edible and included in the drawn weight.

Preparing samples for the chemical analysis

The flesh of the front and hind parts, chest, loin, kidneys and heart was separated from bones and weighed. The meat was mixed thoroughly by a mincer. After taking fresh samples for moisture, ash and protein determination, the residue was dried in wide dishes (20 × 40 cm.) at 70 °C. in an electric oven for fat determination.

Methods of Chemical analysis

Methods used followed the general conventional methods of the A.O.A.C. (1) using triplicate samples for each determination.

Moisture

It was determined by drying ca. 5 gm. of the sample in a shallow dish using an electric oven at 95° C. for one day up to a constant weight.

Ash

It was determined by drying ca. 5 gm. of the fresh sample in a porcelain crucible, then burning using Bunsen flame. Ashing continued in a Muffle furnace at 600° C. for half an hour.

Crude protein

Kjeldahl method was followed using mercury as a catalyst with conc. H_2SO_4 (0.7 gm./30 ml.) ; after clearing, digestion continued for 3 hrs.

Crude fat

Ethyl ether was used for extraction using Soxhlet apparatus and the dried samples at 95° C.

Total carbohydrates

It was obtained as the difference between 100 and the sum of moisture, protein, ash and fat.

Methods of calculating calorific value

It was calculated on the basis of the conventional physiological fuel values, *i.e.* 4 Calories per one gram protein, or carbohydrates and 9 Calories per one gram fat (11).

RESULTS AND DISCUSSION

Live weight L.W.

The live weight of the Flemish giant rabbit (Table 1) at the age of 15 weeks old for Rabbits 1,2 and 3 varies between 1609 and 1788 gm. while the corresponding weight at 18 weeks for Rabbits 4,5 and 6 were between 1745 and 2296 gm. The weights at 18 weeks tended to be higher and rabbits fed on clover — concentrate mixture were heavier. Rabbit 7 fed on concentrates was distinctly inferior in weight. Such results were already discussed in the previous studies. The weights here are higher than recorded with baladi rabbits at similar ages (7).

Weight after slaughter

The percentage of the weight after slaughter from live weight was practically the same among rabbits ranging between 95.64 and 97.16. The absolute loss of drained blood ranged between 49 and 78 grams. Its percentage from live weight ranged between 2.82 and 4.54 with an average of 3.34 fluctuating within narrow limits. The skin, tail and end of legs removed to produce the dressed weight amounted to ca. one seventh of the L.W. They ranged between 12.85 and 15.19 % of L.W.

Dressed weight

The average dressed weight was 82.43 of the live weight ranging within fairly narrow limits (81.16% and 83.99%) among rabbits.

Drawn weight (total edible parts)

The drawn weight (including the head) ranged between 55.79% and 64.26% of L.W. with an average of 60.07%. Such percentage is similar to that recorded by Davis (2). The range is wide without any special trend. This needs further wider investigations.

Main body (front parts, chest, loin, hind parts and neck)

The percentage of the main body varied also widely ranging between 44.26% and 53.87% with an average of 49.09 of L.W.

The total inedible parts (T.I.P.)

The total inedible parts (skin, tail, end of legs, lungs and inedible viscera) as a percentage from the live weight varied noticeably between 32.44 and 40.99% with an average of 36.59%.

The total waste

The percentage of the total waste (T.I.P and blood) ranged widely between 35.74% and 44.21% of L.W. with an average of 39.93%. The range was the same as that with the drawn weight.

Minor parts

From the data in Table 1, the average percentages of minor edible parts from L.W. were 7.75, 77.44, 23.92, 6.50 and 4.44% for the front parts, hind parts, loin-chest-neck parts, head and heart-kidney-liver parts respectively. They fluctuated within narrow limits in all cases except with the loin-chest-neck part which ranged widely between 19.45% and 27.65%. This part appeared to be the major source of variation in the dressing percentage of the main body discussed above.

The inedible viscera constituted ca. half of the total waste of the rabbits being 21.82% (18.00-25.83) of L.W. and ranging widely among rabbits causing variation in the T.I.P.

Table 1.—The carcass quality and dressing percentage of Flemish Giant rabbits. Rabbits 1, 4 fed on clover, 2,3,5,6 on clover — concentrate mixtures and 7 on concentrates.

Items	Rabbit 1	Rabbit 2	Rabbit 3	Rabbit 4	Rabbit 5	Rabbit 6	Rabbit 7	Average
Age in weeks	15	15	15	18	18	18	18	16.7
Live weight in grams	1609	1788	1737	1745	1866	2296	1483	1789
<i>Dressing % from live wt.</i>								
<i>I. Major parts :-</i>								
a. Wt. after slaughter	96.95	95.64	96.84	96.68	96.78	97.16	96.70	96.66
b. Dressed wt.	82.84	81.16	83.99	81.49	82.20	82.62	82.74	82.43
c. Drawn wt	59.54	58.95	61.77	59.72	55.79	60.46	64.26	60.07
e. Total inedible parts	37.41	36.69	35.07	36.96	40.99	36.70	32.44	36.59
d. main body	49.16	47.76	51.00	47.62	44.26	50.08	53.87	49.09
<i>II. Minor parts :-</i>								
g. loss in blood	3.04	4.54	3.16	3.32	3.22	2.82	3.30	3.34
h. front parts	7.89	7.77	8.18	7.22	7.07	7.40	8.70	7.75
i. hind parts	16.10	16.83	18.19	17.82	17.74	17.86	17.53	17.44
j. loin, chest, neck	25.17	23.15	24.64	22.58	19.45	24.83	27.65	23.92
k. head	6.65	6.99	6.28	6.99	6.27	5.97	6.34	6.50
l. heart, kidney, liver	3.73	4.03	4.49	5.10	5.25	4.40	4.05	4.44
m. inedible viscera	22.81	21.64	21.70	21.09	25.83	21.69	18.00	21.82
n. skin, tail, end of leggs ..	14.11	14.48	12.85	15.19	14.58	14.54	13.96	14.23
o. lungs	0.50	0.57	00.51	0.69	0.59	0.49	0.47	0.56
Total in II	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
<i>other data :</i>								
% of flesh form drawn wt.	76.10	75.90	71.01	75.81	73.67	76.72	75.87	75.00

The edible parts relative to the drawn weight

The calculated percentage of the main body from the drawn weight ranged between 79.34 and 84.83% with an average of ca.83%. The average percentages of minor edible parts from the drawn weight were 12.99, 27.05, 39.81, 10.88 and 7.42 for the front parts, hind parts, loin-chest-neck parts, head and heart-kidney-liver parts respectively. Fluctuations were again narrow except with the loin-chest-neck part which ranged between 35.44 and 43.00%.

The edible flesh and bone relative to the drawn weights

The percentage of total edible flesh from the drawn weight ranged between 71.01% and 76.72% with an average of 75.00%. Bones ranged between 23.28% and 28.99% with an average of 25.00%, being ca. a quarter of the drawn weight.

From this study, it could be concluded that Flemish giant rabbits weighing from 1.5 - 2.25 kg. at the age of 15 - 18 weeks would produce 60% (55 - 65) of its live weight as total edible parts (drawn weight) and 50% (44-54) as edible parts offered for the table (main body). The factors affecting these variations among rabbits need further investigation. In the market, more variations ought to be expected owing to variations in intestinal food residues.

The nutritive analysis and calorific value of the edible flesh

Results in Table II indicates that the carbohydrate fraction in the edible flesh was negligible not exceeding 0.15%.

TABLE II.—The nutritive analysis and calorific value of the whole edible flesh of Flemish Giant Rabbit

Animal	Moisture	Protein	Fat	Ash	Carbohydrate	Calorific Value / kg.
	%	%	%	%	%	Calories
1	72.47	21.21	4.90	1.32	0.10	1293.4
2	74.67	19.00	4.69	1.55	0.09	1185.7
3	73.43	20.43	4.64	1.38	0.12	1239.6
4	71.60	19.11	7.85	1.29	0.15	1476.9
5	71.68	20.01	7.02	1.19	0.10	1436.5
6	71.04	19.93	7.70	1.25	0.08	1493.4
7	73.09	18.65	6.97	1.18	0.11	1399.4
Average	72.56	19.77	6.25	1.31	0.11	1357.3

Moisture ranged within narrow limits, between 71.04% and 74.67% with an average of 72.56%.

Fat percentage ranged between 4.64% and 7.85% with an average of 6.25%. It was ca. 2 degrees of percentage higher in older rabbits. Fat percentage is not of a high order as the rabbits slaughtered were not advancing in age.

The protein percentage ranged between 18.65% and 21.21% with an average of 19.77%, being lower than that recorded by Romanovskii (9).

The ash percentage ranged between 1.18% and 1.55% with an average of 1.31%. It seems to decrease in older rabbits. The calorific value ranged between 1185.7 and 1493.4 with an average of 1357.3 Calories per one kilogram of rabbits, flesh.

The average composition of the dry edible flesh of the rabbits was 72.04, 22.78, 4.77 and 0.41% for protein, fat, ash and carbohydrates respectively with an average calorific value of 4946.0 Cal.

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تغذية أرانب فلنش جاينت النامية

ثالثا : نسبة التصافي للأجزاء المختلفة والتحليل الغذائي للحم المأكول

أحمد كامل أبو رية ، محمد على رأفت ، محمود رشدى العبادى وسيد محمد تونى

الملخص

درست النسب المثوية لأجزاء الأرانب لمذبوحة من صنف الفلندر الكبيرة وكذلك التركيب الكيميائى الغذائى لجميع اللحم المأكول وذلك فى سبعة ذكور فى سن ١٥ و ١٨ أسبوعا . وقد تراوح الوزن الحى بين ١٤٨٣ر١ ، ٢٢٩٦ر٢ كجم . ووجد أن متوسط نسبة الدم والجلد والجسم المأخوذ للمائدة يبلغ ٣٢٢ر٣ ، ١٤٢٤ر٦ ، ١١٠ر٦٪ من الوزن الحى على الترتيب . وبلغت نسبة اللحم المأكول ٧٥٪ من الجسم المأخوذ للمائدة وتبلغ العظام ٢٥٪ منه . وكان التحليل الغذائى للحم المأكول (طازج) فى المتوسط هو ٧٢٥٦ر٧٪ رطوبة و ١٩٧٧ر١٪ بروتين و ٦٢٥ر٦٪ دهن و ٣١ر١٪ رماد و ١١ر٠٪ كربوايدرات . وبلغت لحرارة الفسيولوجية فى المتوسط لكل كيلو جرام لحم طازج ١٣٥٧ سعرا كبيرا .