

**A STUDY OF CARCASS QUALITY AND DRESSING  
PERCENTAGES OF DIFFERENT BREEDS AND CROSSES  
OF CHICKENS WITH REFERENCE TO THE NUTRITIVE  
VALUE OF THE EDIBLE PARTS**

*By*

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**SUMMARY**

Slaughter experiments were undertaken with ten hens and ten cocks of different breeds and crosses, for studying the dressing percentages and nutritive analysis of the edible parts. Results indicate that the percentages of the weights after slaughter from the live weight are practically the same with cocks and hens among the different breeds and crosses, being about 96%. So long the birds are slaughtered after such a fastening period of 24 hrs., There is no practical variation in the percentage of dressing weight from the live weight regardless of sex and breed. An average of 90% represents the dressing weight. An average of 70% of the live weight represents the drawn weight in both cocks and hens. The percentage of the main body weight from the live weight in cocks is higher than that in hens being 60.7% for the former and 56.8% for the latter. The percentage of the total in edible parts in hens is higher, than that in cocks being 23.4% for the former and 18.3% for the latter. High and low percentages are found in local breeds and crosses showing that the variation is more likely due to individual rather than breed variation. The percentage of the main body from the drawn weight is practically approaching one another with the different cocks and different hens being about 85%. Studying the nutritive analysis of the front and hind body meat, the liver and gizzard plus heart reveals the fact that the composition varies in the parts and organs. There are major differences in composition between the meat from the front and hind body. There is a slight decrease in the percentage of the protein, in the hind part meat than that of the front part, while the fat in the latter is distinctly higher than that of the former. This is expected because the deposit fat is more in the hind part than that of the front part.

**INTRODUCTION**

A study of the carcass quality of the local breeds as well as foreign breeds and their crosses was undertaken. Such a study is of importance for the the comparison between the different breeds and crosses as well as for the commercial purposes. There is a general complain about the present system of marketing birds for table use relying on live weight. The system encourages the sellers for adultration by forced feeding or watering to selling. Some authorities suggested to substitute such system by taking the dressing weights of the main edible parts of the body as a beter base for marketing.

Introducing such a system in Egypt needs clear informations about the dressing qualities in order to have some basis for evaluating and fixing the prices of the edible parts of the carcass. Moreover, the nutritive analysis of the edible parts would also make the picture clearer. A knowledge of the analysis would be of great value for human dietetics particularly for the sick persons.

## EXPERIMENTAL AND METHODS

### Birds of the Experiment

Ten of both matured hens and cocks were selected from ten different breeds and crosses. The birds were one year old. A cock and a hen were chosen at random from each breed or cross to be slaughtered.

### Methods of Conducting the Experiment

#### (a) *Preparing birds for slaughter and dressing*

1. The birds were kept one day without food. Water only was offered.
2. In the next morning the birds were weighed then slaughtered by cutting the neck near the first cervical vertebra (according to moslems' custom).
3. After draining out the blood, the body was weighed.
4. The birds were plucked from the feather, and were then weighed to know the "Dressing weight".
5. The inedible viscera and other inedible parts such as head, ends of wings and legs were taken aside and weighed. The remaining carcass (main body and neck) along with the edible viscera (liver, empty gizzard and heart) were weighed to determine the "Drawn weight", or other words, the "total edible parts, T.E.P."

#### (b) *Preparing samples for the chemical analysis*

The flesh of the front part was separated from the bones, and minced by a suitable minser. A sample for the liver as well as for the the gizzard plus the heart was obtained by the minser. Each sample was kept in a crucible to be used for further determinations. Weighings of 2-7 gm. were taken by the different methods using a quick balance to the nearest second decimal.

(c) *Methods of the chemical analysis*

The analytical methods of moisture, ash, crude protein, fat and carbohydrates followed the general conventional methods of the A.O.A.C. (1) using duplicate or triplicate samples for each determination.

## RESULTS AND DISCUSSION

## A.—Comparative study of the carcass quality and dressing percentage in hens and cocks of the different breeds and crosses

1.—*Live weight*

It appeared from Table (1) and Table (2) that the live weight of R.I.R. was the highest and that of the local breeds was the lowest. The live weight of the heaviest breed R.I.R. was 3.165 kg. for the cock and 3.050 kg. for the hen. The corresponding live weights for Fayoumi were 1.500 kg. and 1.165 kg.

2.—*Weight after slaughter*

Although the slaughtered birds among the breeds and crosses differ in the original live weight, yet the percentages of the weight after slaughter from the live weight were practically the same. In cocks the range of the percentage of the weight after slaughter was between 95.0 and 97.1 with an average of 96.0%. In hens the range was between 95.8 and 97.6 with an average of 95.5%. An average of 96% could be a practical average of the weight after slaughter for poultry.

3.—*Dressing weight*

The percentage of the dressing weight from the original live weight ranged between 87.4 and 90.5 in cocks and between 87.6 and 93.5 in hens. An average of 90% among all the breeds and crosses could represent the dressing weight in chickens.

4.—*Drawn weight (Total edible parts "T.E.P.")*

The drawn weight as a percentage from the live weight in cocks ranged between 64.1 and 75.8, and it ranged between 61.9 and 71.8 in hens. An average of 70% of the live weight could represent the drawn weight.

5.—*Main body weight (The front and the hind parts)*

The percentage of the main body (usually offered for table) from the live weight in cocks ranged between 54.6 and 65.0 with an average of 60.7%. In hens the range was between 48.3 and 61.9 with an average of 56.8%. It appeared that the percentage of the main body weight from the live weight in cocks was higher than that in hens.

TABLE 1.— Carcass quality and dressing percentage of cocks in the different breeds and crosses

Items	Baladi Red	Baladi white	Payoumi	R.I.R. × Baladi Red	R.I.R. × Baladi White	R.I.R. × Payoumi	R.I.R. × Baladi Red	R.I.R. × Baladi White	R.I.R. × (R.I.R. × Payoumi)	Rhode Island Red
<i>Weight in grams</i>										
Live wt. . . . .	1700	2050	1500	1985	1650	2155	2550	2580	2380	3165
Wt. after slaughter . . . . .	1630	1990	1450	1885	1570	2070	2460	2470	2295	3035
Dressed wt. . . . .	1510	1850	1340	1735	1450	1930	2300	2290	2140	2865
Drawn wt. (T.E.P.) . . . . .	1255	1368	1096	1350	1200	1625	1785	1800	1525	2400
Main body . . . . .	1072	1199	935	1160	1039	1400	1525	1485	1300	2048
Total inedible parts . . . . .	255	482	244	385	250	305	515	490	615	465
<i>As percentage from live weight.</i>										
Wt. after slaughter . . . . .	95.9	97.1	96.7	95.0	95.2	96.1	96.5	95.7	96.4	95.9
Dressed wt. . . . .	88.8	90.2	89.3	97.4	97.9	98.6	90.2	88.8	89.9	90.5
Drawn wt. . . . .	73.8	66.7	73.1	68.0	72.7	75.4	70.0	69.8	64.1	75.8
Main body . . . . .	63.1	58.5	62.3	58.4	63.0	65.0	59.8	57.6	54.6	64.7
Total inedible parts . . . . .	15.0	23.5	16.3	19.4	15.2	14.2	20.2	19.0	25.8	14.7
<i>As percentage from drawn wt.</i>										
Main body . . . . .	85.4	87.6	85.3	86.0	86.6	86.1	85.5	82.5	85.2	85.3
Front part . . . . .	41.0	36.3	37.9	36.7	36.6	36.9	38.7	34.4	38.0	37.8
Hind part . . . . .	44.4	51.3	47.4	49.3	50.0	49.2	46.8	48.1	47.2	47.5

TABLE 2.—Carcass quality and dressing percentage of hens in the different breeds and crosses

Items	Baladi Red	Baladi white	Fayoumi	R.I.R. × Baladi Red	R.I.R. × Baladi White	R.I.R. × Fayoumi	R.I.R. × (R.I.R. × Baladi Red)	R.I.R. × (R.I.R. × Baladi white)	R.I.R. × (R.I.R. × Fayoumi)	Rhode Island Red
<i>Weight in grams</i>										
Live wt. . . . .	1190	1450	1165	1485	1665	1715	2840	2480	2330	3050
Wt. after slaughter . . . . .	1140	1390	1130	1425	1605	1650	2770	2420	2240	2940
Dressed wt. . . . .	1070	1270	1060	1325	1500	1560	2655	2285	2055	2810
Drawn wt. (T.E.P.) . . . . .	850	897	820	995	1129	1170	1790	1780	1370	2160
Main body . . . . .	699	784	690	830	900	980	1515	1535	1125	1885
Total inedible parts . . . . .	220	373	240	330	371	390	865	505	685	650
<i>As percentage from live weight</i>										
Wt. after slaughter . . . . .	95.8	95.9	97.0	96.0	96.4	96.2	97.5	97.6	96.1	96.4
Dressed wt. . . . .	89.9	87.6	91.0	89.2	90.1	91.0	93.5	92.1	88.2	92.1
Drawn wt. . . . .	71.4	61.9	70.4	67.0	67.8	68.2	63.0	71.8	58.8	70.8
Main body . . . . .	58.7	54.1	59.2	55.9	57.7	57.1	53.3	61.9	48.3	61.8
Total inedible parts . . . . .	18.5	25.7	20.6	22.2	22.3	22.7	30.5	20.4	29.4	21.3
<i>As percentage from drawn wt.</i>										
Main body . . . . .	82.2	87.4	84.1	83.4	85.0	83.8	84.6	86.2	82.1	87.3
Front part . . . . .	39.1	39.8	40.2	41.3	39.9	40.2	38.8	39.6	39.4	37.7
Hind part. . . . .	43.1	47.6	43.9	42.2	45.1	43.6	45.8	46.6	42.7	49.6

#### 6.—*Total inedible parts (T.I.P.)*

The total inedible parts (head, ends of the wings and legs and inedible viscera) as a percentage from live weight, varied widely among birds of different breeds and crosses. In cocks the range was between 14.2 and 25.8 with an average of 18.3%. In hens the range was between 18.5 and 30.5 with an average of 23.4%. It is clear that the percentage of the total inedible parts in hens is higher than in cocks.

#### 7.—*The edible parts relative to the drawn weight*

The percentage of the main body from the drawn weight was practically approaching one another with different cocks and different hens. The range was between 85.2 and 87.6% in cocks with an average of 85.6% and it was between 82 and 87.4% in hens with an average of 84.6%. An average of 85% of the drawn weight could represent the percentage of the main body.

The percentage of the front part from the drawn weight ranged between 34.4 and 41.0 in cocks and between 37.3 and 41.3 in hens with an average of ca 38.5 for different birds in both sexes. The percentage of the hind part from the drawn weight ranged between 44.4 and 57.3 in cocks and between 42.2 and 49.5 in hens with an average of ca 46.6 for different birds in both sexes. In general it appeared that the hind part was ca one and a quarter times as much as the front part.

### B.—*Analytical Study on the Meat of the Main Body and Total Edible Parts (T.E.P.)*

#### 1.—*The main body meat in cocks*

It appeared from Table (3) that the percentage analysis of all nutrients were very similar among the cocks with the exception of fat which varied more likely due to individual rather than breed. The range of analysis of the main body meat among birds was as follows :

Moisture %	67.03 - 75.02
Protein %	19.96 - 24.89
Fat %	1.54 - 7.80
Ash %	0.94 - 1.23

The calorific value per kg. ranged between 1096 and 1671 cal.

2.—*Total edible parts (T.E.P.) with cocks*

It appeared from Table (4) that the composition of the total edible parts (main body + liver + heart + gizzard) was practically of the same order for the main body of each breed or cross breed. This is expected as the main body constituted the majority of the T.E.P. The range of chemical analysis of the T.E.P. was as follows:

Moisture %	68.83 - 74.63
Protein %	20.28 - 23.73
Fat %	1.77 - 9.22
Ash %	0.95 - 1.22

The calorific value per kg. ranged between 1112 and 1781 cal.

3.—*The main body meat in hens*

It appeared from Table (5) that the percentage analysis of all nutrients were similar among the hens with the exception of fat. The following ranges of the analysis among birds were obtained:

Moisture %	55.56 - 67.66
Protein %	17.49 - 22.98
Fat %	8.32 - 23.79
Ash %	0.77 - 0.04

The calorific value per kg. ranged between 1668 and 2903 cal.

4.—*Total edible parts (T.E.P.) with hens*

It appeared from Table (6) that the composition of the total edible parts, was practically of the same order for the main body, for each breed or cross breed. This is expected as the main body constituted the majority of the T.E.P. The following ranges of the analysis were obtained:

Moisture %	53.39 - 66.62
Protein %	17.65 - 22.39
Fat %	9.91 - 25.09
Ash %	0.79 - 1.03

The calorific value per kg. ranged between 1789 and 3222 cal.

TABLE 3.—Nutritive analysis of the main body meat of the experimental cocks along with the absolute nutrients

Breed	Fresh weight		Analysis of fresh material						Absolute nutrients			
	From original L.W.	Absolute	Moisture	Protein	Fat	Ash	Carbohydrate	Calorific value per/kg.	Dry matter	Protein	Fat	
	%	gm.	%	%	%	%	%	(cal.)	gm.	gm.	gm.	
Baladi red . . . . .	44.82	762	69.12	23.15	6.54	1.04	0.15	1521	135.33	176.42	49.88	
Baladi white . . . . .	41.66	854	75.02	19.96	3.20	1.23	0.59	1110	203.31	170.49	27.31	
Fayoumi . . . . .	48.33	725	70.54	22.99	5.32	1.02	0.13	1403	213.59	166.70	38.55	
R.I.R. × Baladi red . . . . .	43.58	865	71.48	24.89	2.55	1.08	0.00	1225	146.73	215.38	22.02	
R.I.R. × Baladi white . . . . .	47.82	789	71.09	23.18	4.70	1.03	0.00	1350	218.14	182.89	37.11	
R.I.R. × Fayoumi . . . . .	48.03	1035	67.03	24.23	7.80	0.94	0.00	1671	341.20	250.74	80.69	
R.I.R. × (R.I.R. + Baladi red)	43.33	1105	70.24	23.45	5.30	1.01	0.00	1415	328.89	259.12	5.30	
R.I.R. × (R.I.R. × Baladi white)	43.22	1115	70.29	22.61	6.03	1.01	0.06	1450	331.28	252.07	6.03	
R.I.R. × (R.I.R. × Fayoumi)	38.03	905	73.53	23.94	1.54	0.99	0.00	1096	239.61	216.70	13.95	
Rhode Island red . . . . .	98.12	1523	68.99	24.00	6.05	0.96	0.00	1505	272.26	365.57	92.07	



TABLE 4.—Nutritive analysis of the total edible parts (main body + liver + heart + gizzard) of the experimental cocks along with the absolute nutrients

Breed	Fresh weight		Analysis of fresh material					Absolute nutrients			
	From original L.W.	Absolute gm.	Moisture %	Protein %	Fat %	Ash %	Carbohydrate %	Calorific value per/kg.	Dry matter gm.	Protein gm.	Fat gm.
	%	gm.	%	%	%	%	%	(c.l.)	gm.	gm.	gm.
Baladi red . . . . .	49.53	842	68.83	23.00	6.85	1.04	0.28	1548	262.46	193.69	57.67
Baladi white . . . . .	46.34	950	74.63	20.28	3.21	1.23	0.65	1126	241.01	192.70	30.47
Fayoumi . . . . .	52.33	785	70.34	22.81	5.59	1.03	0.23	1424	222.81	179.06	43.89
R.I.R. × Baladi red . . . . .	47.20	937	71.37	24.77	2.76	1.09	0.01	1249	268.25	232.09	25.86
R.I.R. × Baladi white . . . . .	51.09	843	70.86	23.12	4.96	1.05	0.01	1375	245.64	194.96	41.80
R.I.R. × Fayoumi . . . . .	52.34	1128	66.06	23.73	9.22	0.95	0.04	1781	382.88	267.64	104.03
R.I.R. × (R.I.R. × Baladi red) . . . . .	47.69	1216	69.95	23.20	5.82	1.02	0.01	1452	355.46	282.10	70.83
R.I.R. × (R.I.R. × Baladi white) . . . . .	47.75	1232	69.93	22.41	6.57	1.02	0.07	1491	361.40	276.14	80.92
R.I.R. × (R.I.R. × Fayoumi) . . . . .	41.64	991	73.42	23.77	1.77	1.00	0.04	1112	263.37	235.55	17.56
Rhode Island Red . . . . .	51.69	1636	68.10	23.53	7.41	0.96	0.00	1608	521.81	385.01	121.19

TABLE 5.—Nutritive analysis of the main body meat of the experimental hens along with the absolute nutrients

Breed	Fresh weight		Analysis of Fresh materials					Absolute nutrients			
	From Original L.W.	Absolute	Moisture	Protein	Fat	Ash	Carbohydrate	Calorific value per/kg.	Dry matter	Protein	Fat
	%	gm.	%	%	%	%	%	(cal.)	gm.	gm.	gm.
Baladi red . . . . .	43.28	515	55.56	19.57	23.13	0.94	0.80	2899	228.89	100.78	119.11
Baladi white . . . . .	40.62	589	52.42	17.49	22.84	0.93	1.32	2807	250.78	103.01	134.55
Fayoumi . . . . .	42.06	490	65.11	21.09	12.27	0.83	0.70	1976	170.94	103.34	60.14
R.I.R. × Baladi red . . . . .	40.07	595	67.66	22.98	8.32	1.04	0.00	1668	192.40	136.71	49.53
R.I.R. × Baladi white . . . . .	42.95	715	60.88	18.90	19.22	0.94	0.06	2488	279.72	135.10	137.42
R.I.R. × Fayoumi . . . . .	41.40	710	64.71	21.55	12.72	1.02	0.00	2006	250.54	153.03	90.32
R.I.R. × (R.I.R. × Baladi red)	41.90	1190	57.78	18.50	22.95	0.77	0.00	2766	502.40	220.10	273.11
R.I.R. × (R.I.R. × Baladi white)	50.00	1240	56.26	19.05	23.79	0.90	0.00	2903	542.36	236.27	294.93
R.I.R. × (R.I.R. × Fayoumi)	37.77	880	63.17	21.83	14.05	0.95	0.00	2138	324.19	192.19	123.66
Rhode Island red . . . . .	47.69	1445	57.01	18.50	23.70	0.79	0.00	2873	621.15	267.38	342.43

TABLE 6.—Nutritive analysis of the total edible parts (main body + liver + heart + gizzard) of the experimental hens along with the absolute nutrients.

Breed	Fresh weight		Analysis of Fresh materials					Absolute nutrients			
	From Original L. W.	Absolute	Moisture	Protein	Fat	Ash	Carbohy- drate	Calorific value per/kg.	Dry matter	Protein	Fat
	%	gm.	%	%	%	%	%	(cal.)	gm.	gm.	gm.
Baladi red . . . . .	50.59	602	53.39	18.75	25.90	0.93	1.03	3222	280.59	112.87	155.94
Baladi white . . . . .	46.62	676	58.06	17.65	21.90	0.96	1.43	2734	273.54	119.32	148.03
Fayoumi . . . . .	48.67	567	63.57	20.51	14.39	0.87	0.72	2144	206.90	116.30	81.58
R.I.R. × Baladi red . . . . .	45.25	672	66.62	22.39	9.91	1.03	0.05	1789	224.33	150.48	66.58
R.I.R. × Baladi white . . . . .	48.23	803	60.10	18.50	20.39	0.94	0.07	2618	320.38	148.53	163.70
R.I.R. × Fayoumi . . . . .	47.58	816	63.15	20.72	14.99	1.01	0.13	2183	300.70	169.08	122.35
R.I.R. × (R.I.R. × Baladi red) . . . . .	45.67	1297	57.72	18.42	23.05	0.79	0.02	2812	448.36	238.87	298.93
R.I.R. × (R.I.R. × Baladi white) . . . . .	54.31	1347	56.20	18.96	23.89	0.90	0.05	2910	589.95	255.39	321.84
R.I.R. × (R.I.R. × Fayoumi) . . . . .	43.73	1019	62.13	20.98	15.81	0.94	0.14	2268	385.86	213.28	161.11
Rhode Island Red . . . . .	51.19	1551	57.28	18.43	23.49	0.80	0.00	2851	662.49	285.84	364.27

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## دراسة صفات الذبيحة ونسبة التصافي في أنواع وخطان مختلفة من الدجاج وعلاقة ذلك بالقيمة الغذائية للأجزاء القابلة للأكل

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### المخلص

وجد أن النسبة المئوية لوزن الدجاج بعد الذبح ثابتة تقريبا بالنسبة للوزن الحى إذ كانت حوالى ٩٦٪ وكانت النسبة المئوية للطيور بعد التنظيف حوالى ٩٠٪ تقريبا بالنسبة للوزن الحى . أما بالنسبة للأجزاء المأكولة فقد وجد أن النسبة المئوية لهذه الأجزاء أعلى قليلا فى الديوك عن الإناث . وعموما فقد كانت النسبة لكل من الذكور والإناث حوالى ٧٠٪ من الوزن الحى . وقد وجد كذلك أن النسبة المئوية للجزء الرئيسى للجسم ( الجزء الأمامى والجزء الخلفى ) فى الديوك أعلى منها فى الإناث إذ كانت ٧٠.٧٪ ، ٥٦.٨٪ للإناث بالنسبة للوزن الحى . ووجد كذلك أن النسبة المئوية للأجزاء غير المأكولة بالنسبة للوزن الحى فى الإناث أعلى منها فى الديوك حيث بلغت ٢٣.٤٪ فى الأولى و ١٨.٣٪ فى الثانية .

ووجد كذلك أن النسبة المئوية للجسم الرئيسى ( الجزء الأمامى + الجزء الخلفى ) بالنسبة لجميع الأجزاء المأكولة تبلغ ٨٥٪ لكل من الإناث والذكور مع وجود فروق بسيطة فى الإناث والديوك .

ولقد درس التركيب الكيماوى لكل من لحم الجزء الأمامى ولحم الجزء الخلفى والكبد والقونصة مع القلب ووجد اختلاف فى المركبات الغذائية بالنسبة لهذه الأجزاء بعضها عن بعض وأهم هذه الاختلافات هى الفروق الظاهرة بين المركبات الغذائية فى لحم الجزء الأمامى ولحم الجزء الخلفى ... . فبينما نجد الاختلافات بسيطة فى مقدار البروتين نجد أن هذا الاختلاف يظهر بوضوح فى مقدار الدهن فهو يزيد فى الجزء الخلفى لنفس نوع الدجاج سواء فى الإناث أو الذكور . . ووجد كذلك أن مقدار الدهن يزيد فى الإناث والذكور .