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Scientific Report

The Effect of the Sale of Whole or Cut Up Chicken Meat on Enterprise Income According to Season

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Abstract: Weighing data from 389 broiler carcasses and parts formed the research material. The carcasses were divided into 6 different groups according to their weight. Cutting up shrinkage and percentage rates of the parts in the total weight were determined. Gross and net changes in enterprise income were determined according to the summer and winter prices of the whole body and parts. It was determined that cutting up caused a 4.03% net increase in enterprise income at summer prices and a 0.91% net increase at winter prices. It was also determined that cutting up carcasses smaller than 1400 g and greater than 2000 g was not a rational decision for enterprises.

Key Words: Broiler, carcass cut up, part yields, shrinkage, income, seasonal differences.

Piliç Etinin Gövde Halinde veya Parçalanarak Satışının Mevsimler İtibariyle İşletme Gelirine Etkisi

Özet: Araştırma materyalini 389 adet broiler karkası ve parçalarına ait tartım verileri oluşturmuştur. Karkaslar ağırlıklarına göre 6 farklı gruba ayrılmıştır. Parçalama firesi ve parçaların toplam ağırlık içerisindeki yüzde oranları belirlenmiştir. Tüm gövde ve parçaların yaz ve kış dönemi fiyatları üzerinden işletmenin gelirinde meydana gelen brüt ve net değişmeler hesaplanmıştır. Parçalamanın işletme gelirinde yaz fiyatlarıyla ortalama % 4,03; kış fiyatlarıyla ise % 0,91 oranında net artışa neden olduğu tespit edilmiştir. 1400 g'dan küçük ve 2000 g'dan büyük olan karkasların parçalanmasının işletme açısından rasyonel olmadığı saptanmıştır.

Anahtar Sözcükler: Broiler, karkas parçalama, parça verimleri, fire, gelir, mevsimsel farklılık.

Introduction

Today women play an increasing part in economic life due to economic difficulties as well as social and cultural changes. In addition individuals' traditional duty distributions within the family are changing. However, in most families this change arises as the addition of responsibilities of working life onto the existing traditional duties of women. Therefore, today less time is devoted to work like cooking or cleaning than before.

Devoting less time to cooking has changed consumer preferences in food products. Today, cooked or semicooked products, which can be served as a meal in a short time, are preferred.

Chicken meat production is one of the sectors that adapted quickest to this consumer preference change. Chicken meat is also marketed as a whole carcass as well as in parts that reflect different cooking and taste choices.

This marketing method causes a cost increase as well as an increase in income in enterprises that produce chicken meat. A comparison of marginal cost and marginal revenue occuring as a result of marketing the broiler carcass by cutting up is extremely important in deciding on the method of marketing. There are some scientific studies regarding carcass cut up. Benoff et al. (1) researched the effect of processing with traditional and modern methods on 7-9 week old male and female broilers and determined that the most important yield difference between traditional and modern methods was in the leg meat. Heath (2) compared the part yields obtained from cut up carcasses by cooling and not cooling with the aim of determining the factors affecting yield, quality and consumer preferences in broiler meat. Merkley et al. (3), Bilgili et al. (4), Renden et al. (5) and Acar et al. (6) examined the carcass yield and part proportions of eviscerated broiler carcasses on different strains.

The aim of this study is to evaluate the effect of marketing cut up chicken meats of different weights instead of as a whole, on enterprise costs and income,

taking into account the carcass weight and seasonal changes.

Materials and Method

Weighing records of 389 broiler carcasses and parts, which were grouped as 1200 g and below (43 pieces), 1200-1399 g (75 pieces), 1400-1599 g (71 pieces), 1600-1799 g (93 pieces), 1800-1999 g (77 pieces) and 2000 g and above (30 pieces), formed the material for the research. An electronic scale with a 2 g sensitivity was used in the weighing.

Each carcass that was brought to be cut up was weighed as a whole after waiting for 1 h with the aim of straining the waters remaining from the chilling process. Each carcass the weight of which was recorded, was cut up manually with a knife in the form of drumsticks, thighs, fillet (breast meat without bones and skin), wings, neck, back and bone. The cutting up process is indicated in the Figure.

The parts from each body were weighed and recorded separately. During the process of cutting up, the number of bodies cut up by workers at different times within a 1 h period was counted. Thus, the average labor duration required for one body was calculated.

Weighing results were assessed in terms of average market prices as of August 2002 for the summer and as of December 2002 for the winter. With these prices, income gained from sales as a whole and income gained from each of the parts were calculated. Income gained from sales as a whole was subtracted from the total parts income. Thus, the marginal difference in enterprise income as a result of cutting up was determined. It was projected that there would be an increase in production costs due to the cutting up process, labor expenses and cutting up losses. The partial budgeting method was used in determining this cost increase (7). Net wages and insurance premium totals paid to workers were taken into account in calculating the increase in labor costs. Cutting up shrinkage was calculated by subtracting part weights from the whole carcass weight.

Average part weights, part proportions, part incomes, part income proportions, labor expenses per carcass, shrinkage value and net income difference per body were determined using weighing results, prices and wages. Net income difference per body was determined by subtracting the total of sales income from the whole carcass and expenses (shrinkage and labor) from the total of part incomes per body. The results were compared according to body weight groups and seasons. The paired samples t test was applied to determine the significance of the differences between the groups (8).

Results

By means of the duration measurements made throughout the day it was determined that one worker cut up one body and separated the breast bones and skin in an average of 90 s, using a knife thus making the body ready for packaging. Average carcass weights and

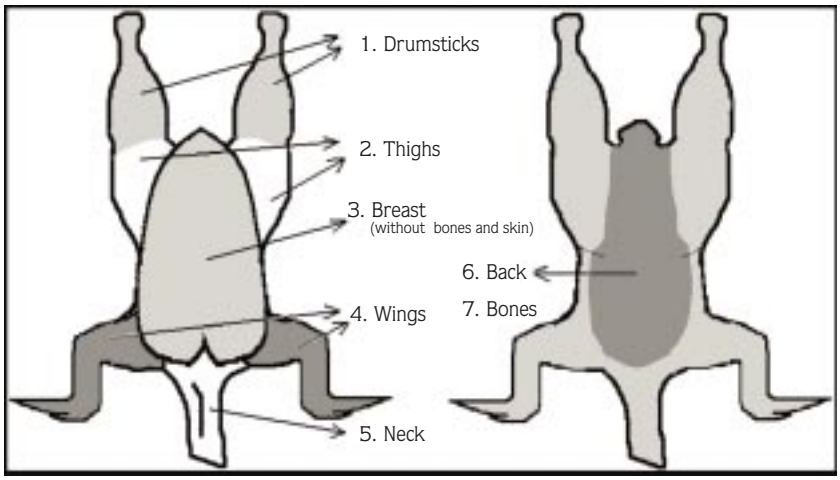

Figure. Carcass parts.

percentage shares of parts in the total weights are given in Table 1.

Shares of part incomes over summer and winter prices in the total income are indicated in Table 2.

Results regarding the shrinkage index formed taking as a basis the shrinkage amount and rate due to the cutting up process and the general shrinkage rate are indicated in Table 3.

Results of the gross and net income differences calculated over the summer and winter prices and the net income index are given in Table 4.

Table 1. Proportion of average carcass weights and part weights (%).

Group (g)	Whole (g)	Neck	Wings	Fillet	Thighs	Drumsticks	Bone	Back
<1200	1101	6.70	12.57	21.88	15.21	14.18	8.31	21.14
1200-1399	1303	6.88	12.19	22.06	15.76	13.97	8.20	20.95
1400-1599	1491	6.38	12.00	22.93	15.55	13.73	8.00	21.41
1600-1799	1690	6.34	11.82	22.95	15.71	14.20	7.78	21.21
1800-1999	1890	6.50	11.41	23.62	15.90	13.87	7.57	21.12
≥2000	2060	6.63	10.84	23.95	16.08	13.62	7.65	21.25
General	1582	6.55	11.85	22.86	15.70	13.96	7.91	21.17

Table 2. Percentage shares of part income in the total (%).

	Neck	Wings	Fillet	Thighs	Drumsticks	Bone	Back
Summer	2.13	16.70	36.53	21.49	16.01	0.24	6.89
Winter	2.19	12.02	29.93	26.31	22.21	0.25	7.09

Table 3. Results of cutting up shrinkage.

Groups (g)	<1200	1200-1399	1400-1599	1600-1799	1800-1999	≥2000	General
Shrinkage (g)	9	10	13	17	23	35	17
Shrinkage (%)	0.85	0.76	0.9	1.01	1.21	1.68	1.01
Index[1]	84.16	75.25	89.11	100.00	119.80	166.34	100.00

[1]Index : 1.01 = 100

Table 4. Results of gross and net income differences.

	SUMMER			WINTER		
Group (g)	Gross Income Difference (%)	Net Income Difference (%)	Net Income Index[a]	Gross Income Difference (%)	Net Income Difference (%)	Net Income Index[b]
<1200	5.59	2.86	70.97	2.97	-0.24	-26.37
1200-1399	5.95	3.60	89.33	3.13	0.17	18.68
1400-1599	6.39	4.10	101.74	3.48	0.83	91.21
1600-1799	6.74	4.51	111.91	4.15	1.60	175.82
1800-1999	6.95	4.65	115.38	4.23	1.64	180.22
≥2000	6.17	3.49	86.60	3.55	0.60	65.93
General	6.39	4.03	100.00	3.67	0.91	100.00

[a]Index: 100 = 4.03 [b]Index: 100 = 0.91

Discussion

As it is apparent from the results of the proportion of part weights (Table 1) fillet occupies the greatest share in the total weight. Results concerning the percentage distribution of part weights are compatible with the data in the literature (9,10). When a comparison is made according to groups, the fillet share in the total weight increases depending on the carcass weight, and the wing share decreases.

When the proportion of part incomes (Table 2) is examined, fillet and thighs occupy first place according to both season prices. The percentage share of wing and fillet incomes in the total income was higher in the summer. The thigh and drumstick incomes represented less of the total income in the summer.

When the shrinkage results (Table 3) due to the cutting up process are examined, the shrinkage amount increases with the carcass weight. When the shrinkage index, which is formed taking as a basis the general shrinkage rate calculated on whole carcasses examined within the study, is examined, it can be seen that with the cutting up of carcasses of 2000 g and above, 66.3% more shrinkage occurs compared to the average.

It was determined that an average 6.39% gross increase was likely to occur in summer prices as an average of sales income due to the cutting up process and a 3.67% gross increase in winter prices. When the average net income increase data, which are calculated by subtracting the shrinkage and labor costs from the gross income increase, were examined, a 4.03% increase was likely to occur at summer prices and a 0.91% increase at winter prices. The net income increase was considered statistically significant ($P < 0.01$).

Since chicken products are mainly grilled in the summer, the demand for chicken meat in the form of wings, thighs or fillet increases. This causes a relative increase in the prices of these parts. However, as can be seen from Table 4, the net income increase due to the cutting up process is higher in the summer.

From the general data, it appears that marketing the broiler carcass by cutting up instead of as a whole carcass will cause an increase in enterprise income. When the data are assessed according to groups, cutting up carcasses weighing less than 1200 g will cause a decrease in enterprise income, especially when winter prices are taken into account. However, the cutting up of carcasses weighing between 1200 and 1399 g and over 2000 g seems to cause an increase in net income according to both season prices, and it should be taken into account that parts such as the wings and drumsticks of these groups' carcasses may be so small or large as to negatively affect consumer preferences.

As conclusion, as can also be seen from the net income indices given in Table 4, carcasses weighing 1400 - 1999 g at summer prices and 1600 - 1999 g at winter prices produce a net income above the average. Therefore, it will be a more rational decision for an enterprise to offer the carcasses in these groups to the market by cutting up in the relevant seasons. It may sell the small carcasses in the groups that provide an income increase below the average as a whole, and carcasses weighing 2000 g and above by processing with further techniques to forms such as schnitzels, chicken croquettes and chicken meat balls.

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