The effect of chicken meat marketing with different cutting methods on enterprise income

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Summary: The aim of this study is to determine the effect of marketing chicken carcasses after different cutting methods, on the enterprise income, taking into account seasonal price changes. The study was carried out in the Meat and Fish Organization Sincan Slaughtering Plant Poult Unit (Ankara-Turkey) between March 2002-May 2002. The research material included total 850 pieces broiler carcasses, which were cut up with conventional methods using a knife. In the research, 2 different conventional cutting methods were used. In the 1st method, the carcasses were cut-up into 7 parts as drumsticks, thighs, fillet (breast meat without bone and skin), wings, for soup (back), neck and bone. In the 2nd method the carcasses were cut-up into 4 parts as wings, legs (hindquarter), whole breast (with breast meat, back, bone and skin) and neck. In the 1st method, it was determined that there was an average increase of 4.03 % in the enterprise income with summer term prices; and an increase of 0.91 % with winter term prices. In the 2nd method, it was determined that respectively 13.18 and 3.35 % increases would be obtained in the income. It was found out that the 2nd method, in which the work force efficiency was high and the shrinkage rate was less, provided more net income increase to the enterprise.

Key words: Broiler, carcass, cut up, income, seasonal differences.

Farklı parçalama metodları ile piliç eti pazarlamasının işletme geliri üzerine etkisi

Özet: Bu çalışmanın amacı, farklı parçalama metotları ile piliç eti pazarlamasının, işletme geliri üzerine olan etkisinin, mevsimsel fiyat değişiklikleri de göz önüne alınarak belirlenmesidir. Çalışma, Et ve Balık Kurumu Sincan kanatlı kesimhanesinde, Mart 2002-Mayıs 2002 tarihleri arasında gerçekleştirilmiştir. Araştırmanın materyalini, bıçak kullanılarak geleneksel yöntemlerle parçalanan toplam 850 adet broyler karkası oluşturmuştur. Araştırmada 2 farklı geleneksel parçalama metodu kullanılmıştır. Birinci metotta, karkaslar, but, baget, fileto (kemik ve deri hariç göğüs eti), kanat, çorbalık (kemikli sırt), boyun ve kemik olmak üzere 7 ayrı parçaya, ikinci metotta ise kanat, arka bacaklar, bütün göğüs (göğüs eti, sırt, kemik ve deri dahil) ve boyun olmak üzere 4 ayrı parçaya ayrılmıştır. Araştırma kapsamında incelenen 1. parçalama metodunda, işletme gelirinde yaz dönemi fiyatlarıyla ortalama % 4.03'lük, kış dönemi fiyatlarıyla ise % 0.91'lik bir artış olduğu saptanmıştır. 2. parçalama metodunda, işletme gelirinde elde edilen artış oranları, yaz ve kış dönemi fiyatlarıyla sırasıyla % 13.18 ve % 3.35 olarak belirlenmiştir. Kullanılan 2. metotda, işgücü verimliliğinin yüksek ve fire oranının düşük olmasının, işletmede daha büyük bir net gelir artışı sağlanmasında etkili bulunduğu ortaya konulmuştur.

Anahtar sözcükler: Broyler, gelir, karkas, mevsimsel farklılıklar, parçalama.

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 to the existing traditional duties of women. Therefore, today less time is devoted to work like cooking or cleaning than those in the past.

Devoting less time to cooking has changed consumer preferences in food products. Today, cooked or semi cooked 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 the changes in consumer preferences. Chicken meat is also marketed as a whole carcass, as well as in parts that reflect different cooking and taste choices.

This marketing method resulted a costs increases in both production and enterprise income of the firms. A comparison of marginal cost and marginal revenue occurring as a result of marketing the broiler carcass by cutting up is extremely important in deciding on the method of marketing.

There are various scientific studies about the cut-up and marketing of chicken meat. Benoff *et al.* (2) assessed the effect of processing 7-9 week old male and female

broilers with conventional and modern methods on the meat yield. Cevger *et al*. (4); Cevger *et al*. (5) compared the effect of different cutting methods in broiler carcasses on enterprise income according to seasons. Merkley *et al*. (8); Bilgili *et al*. (3); Renden *et al*. (9) and Acar *et al*. (1) examined the carcass yield and part proportions of the broiler carcasses in different lines after their viscera were taken out.

In this research not only was examined technical aspect of cutting methods like the other studies above mentioned, but it also was analysed economical aspect.

The aim of this study is to determine the effect of marketing chicken carcasses after different cutting methods, on the enterprise income, taking into account seasonal price changes.

Material and Methods

The study was carried out on 850 pieces chicken carcasses, chosen randomly in the Meat and Fish Products Co. Inc. Sincan Slaughtering Plant Poult Unit (Ankara-Turkey) between March 2002 – May 2002.

In the research, 2 different conventional cutting methods were used. In the 1st method, the carcasses were cut-up into 7 parts as drumsticks, thighs, fillet (breast meat without bone and skin), wing, for soup (back), neck and bone. In the 2nd method the carcasses were cut-up into 4 parts as wing, leg (hindquarter), whole breast (with breast meat, back, bone and skin) and neck. Detailed information about the methods of cutting-up is given in Fig. 1.
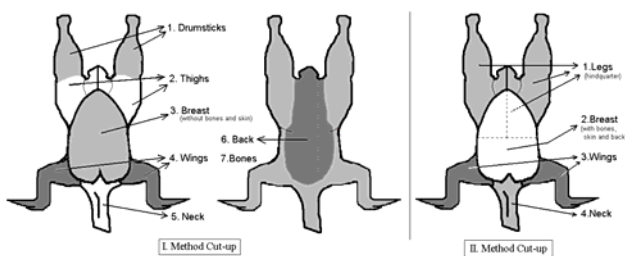

Figure 1. Carcass parts
Şekil 1. Karkas bölümleri

To determine the workforce efficiency, average workmanship duration required for 1 carcass was calculated.

The income earned from the sales as a whole body and the income earned from each of the parts were calculated. The average market prices of August and December 2002 were taken into account as summer and winter prices respectively.

Workforce costs and cutting-up shrinkage cause an increase in the production cost of the cut-up of chicken carcass. Partial budgeting method was used to compare the cost of different cut-up methods (7). The cutting-up shrinkage was calculated by subtracting the total of part weights from the whole carcass weight.

Using the weighing results, prices and wages, average part weights, part proportions, part incomes, part income proportions, workforce costs per body, shrinkage value and gross and net income difference per carcass were calculated.

Gross income difference was obtained by subtracting the sales income as a whole carcass from the total of parts income. Net income difference was calculated by subtracting the total of costs (shrinkage and workforce) from the gross income difference. The results were compared by indexes according to the cutting methods, carcass weight groups and seasons. Paired-Samples T test was applied for the importance control of the differences between groups (6).

Results

In the research, it was determined with the duration measurements made during the working day that 1 worker cut-up 1 carcass with the 1st method in average 90 seconds so as to be ready for packaging by separating the breast bones and the skin. This duration was determined as average 60 seconds with the 2nd method.

The results related to the index formed by taking as a base the cutting-up shrinkage rate occurred in the carcasses that were cut-up and the general average shrinkage rates are indicated in Table 1 and 2.

Percentage shares of the part incomes on summer and winter term prices in the total income are indicated in Table 3 and Table 4.

The gross and net income difference, calculated over the summer and the winter term prices, and the results of net income index are given in Table 5 and 6.

Discussion

When the results regarding the cutting-up shrinkage occurring in the carcasses exposed to cut-up within the scope of the 1st method (Table 1); it is seen that the shrinkage amount increases parallel to the carcass weight increase. When we looked at the shrinkage index results formed by taking general shrinkage rate as a base in the same method, it is seen that according to the average, 66.3 % more shrinkage occurs as a result of cutting-up carcasses weighing 2000 g and above. This rate was 36.5 % in the 2nd method (Table 2).

When Table 2 and Table 3 inspected, it is seen that the average shrinkage rate is 1.01 % in the 1st method and 0.85 % in the 2nd method. Shrinkage rate has increased parallel to the increase of number of parts.

As it is understood from the results regarding the percentage shares of the parts in the total income (Table 3 and Table 4), in the 1st method, the share of wing and fillet in the total income is higher with the summer term prices compared to the winter term. In the 2nd method, a similar change is seen only in wing; in this method, the

Table 1. Results of cutting-up shrinkage with 1st method
Tablo 1. Birinci metod ile parçalamaya ait fire bulguları

Groups (g)	<1200	1200-1399	1400-1599	1600-1799	1800-1999	≥2000	General
n:	43	75	71	93	77	30	389
Shrinkage (g) X±sx	9.35±1.14	9.95±1.03	13.35±1.26	17.12±1.79	22.96±2.87	34.80±7.13	16.71±1.02
Shrinkage (%) X±sx	0.85±0.10	0.76±0.08	0.90±0.09	1.01±0.10	1.21±0.15	1.68±0.34	1.01±0.05
Index*	84.16	75.25	89.11	100.00	119.80	166.34	100.00

* Index : 1.01=100

Table 2. Results of cutting-up shrinkage with 2nd method
Tablo 2. İkinci metod ile parçalamaya ait fire bulguları

Groups (g)	< 1200	1200-1399	1400-1599	1600-1799	1800-1999	≥2000	General
n:	79	73	90	93	82	44	461
Shrinkage (g) X±sx	6.23±0.67	8.36±0.79	12.62±0.94	14.67±1.65	21.66±2.43	25.55±3.59	14.10±0.75
Shrinkage (%) X±sx	0.59±0.06	0.63±0.06	0.84±0.06	0.86±0.09	1.14±0.13	1.16±0.16	0.85±0.04
Index*	69.43	73.77	98.71	100.93	133.57	136.50	100.00

*Index : 0.85 = 100

Table 3. Shares of parts in total income with 1st method (%)
Tablo 3. Birinci metodta karkas bölümlerinin toplam gelir içindeki payları (%)

	n	Neck X±sx	Wing X±sx	Fillet X±sx	Thighs X±sx	Drumstics X±sx	Bone X±sx	For soup X±sx
Summer Term	389	2.13±0.02	16.70±0.07	36.53±0.13	21.49±0.07	16.01±0.05	0.24±0.002	6.89±0.03
Winter Term		2.19±0.02	12.02±0.05	29.93±0.12	26.31±0.08	22.21±0.07	0.25±0.002	7.09±0.03

Table 4. Shares of parts in total income with 2nd method (%)
Tablo 4. İkinci metodta karkas bölümlerinin toplam gelir içindeki payları (%)

	n	Breast X±sx	Leg X±sx	Wing X±sx	Neck X±sx
Summer Term	461	40.53±0.10	42.10±0.09	15.11±0.05	2.26±0.02
Winter Term		40.56±0.10	45.40±0.09	11.79±0.04	2.26±0.02

Table 5. Results of gross and net income difference with 1st method
Tablo 5. Birinci metodta brüt ve net gelir arasındaki farklılık

		Summer			Winter		
Group (g)	N	Gross income difference (%) X±sx	Net income difference (%) X±sx	Net income index[a]	Gross income difference (%) X±sx	Net income difference (%) X±sx	Net income index[b]
< 1200	43	5.59±0.41	2.86±0.45	70.97	2.97±0.30	-0.24±0.34	-26.37
1200-1399	75	5.95±0.30	3.60±0.33	89.33	3.13±0.24	0.17±0.27	18.68
1400-1599	71	6.39±0.29	4.10±0.34	101.74	3.48±0.24	0.83±0.29	91.21
1600-1799	93	6.74±0.30	4.51±0.36	111.91	4.15±0.25	1.60±0.32	175.82
1800-1999	77	6.95±0.28	4.65±0.38	115.38	4.23±0.26	1.64±0.36	180.22
≥2000	30	6.17±0.59	3.49±0.87	86.60	3.55±0.54	0.60±0.82	65.93
General	389	6.39±0.14	4.03±0.17	100.00	3.67±0.12	0.91±0.15	100.00

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

Table 6. Results of gross and net income difference with 2nd method
Tablo 6. İkinci metodta brüt ve net gelir arasındaki farklılık

		Summer			Winter		
Group (g)	N	Gross income difference (%) X±sx	Net income difference (%) X±sx	Net income index[a]	Gross income difference (%) X±sx	Net income difference (%) X±sx	Net income index[b]
< 1200	79	15.80±0.15	13.25±0.19	95.92	5.55±0.13	3.53±0.18	94.81
1200-1399	73	15.58±0.14	13.44±0.18	97.29	5.50±0.12	3.68±0.16	98.87
1400-1599	90	15.47±0.13	13.73±0.18	99.35	5.54±0.11	3.70±0.16	99.41
1600-1799	93	15.90±0.15	14.25±0.22	103.12	5.92±0.13	4.19±0.21	112.35
1800-1999	82	15.92±0.19	14.59±0.30	105.59	5.53±0.18	3.61±0.29	96.75
≥2000	44	14.97±0.24	13.18±0.38	95.39	5.20±0.21	3.35±0.36	89.91
GENERAL	461	15.58±0.07	13.82±0.10	100.00	5.58±0.06	3.73±0.09	100.00

[a] Index: 13.82 = 100   [b] Index: 3.73 = 100

share of wing in total income increases with summer term prices and the share of leg decreases.

When Table 5 is examined, in which results regarding the gross and net income difference in the 1st method are given, it is seen that in the summer term, a net income increase can be obtained above the average as a result of cutting-up the carcasses weighing between 1400-1999 g. In the winter term, a net income increase can be obtained above the average as a result of cutting-up the carcasses weighing between 1600-1999 g.

When the same table is assessed according to the weight groups, it is seen that 0.24 % income decrease occurs as a result of cutting-up carcasses weighing under 1200 g in the winter term.

The gross and net income increase results obtained with the 2nd method (Table 6) indicate that a net income increase can be obtained in the enterprise above the average by cutting up the carcasses weighing between 1600-1999 g in the summer term and between 1600-1799 g in the winter term. Net income increase can be obtained in all groups either in the summer or in the winter term with this cutting-up method.

When the results given in Table 5 and Table 6 are compared from the aspect of cutting-up methods, it is seen that either in the summer term or in the winter term, more net income increase can be obtained in the 2nd method compared to the 1st method.

The major reason for the 2nd method to ensure a net income increase in a higher rate is that, the low-priced parts of the 1st method spared as back and bone are sold with higher prices among the parts like breast and leg in the 2nd method. Another significant reason is that the labor efficiency in the 2nd method is higher. However, in this method 1 worker can cut up average 60 carcasses by working for 1 hour. This figure is 40 in the 1st method. Therefore, labor cost per carcass is lower in the 2nd method.

Another reason for the income difference between two cutting-up methods is the cutting-up shrinkage. High level of shrinkage, which is a cost element of the cutting-up process, affects negatively the net income difference obtained by cutting-up.

When the research results are assessed in general, it is understood that selling broiler carcasses by cutting-up in both methods will cause increase in the enterprise income. However, it was determined that selling the carcasses weighing less than 1200 g by cutting-up with especially winter term prices in the 1st method would cause a decrease in the enterprise income. Therefore, cutting-up carcasses with this weight and marketing them as a whole will be a rational behavior.

On the other hand, however it is seen that cutting up carcasses weighing between 1200-1399 g in the summer term and carcasses weighing above 2000 g in both seasons with the 1st method will cause a net income

increase, it should be taken into account that parts like wing and drumsticks to be obtained from these groups of carcasses will be so small or big to affect the consumer preferences negatively.

In the 2nd method, the same situation is valid for carcasses weighing less than 1400 g and above 2000 g.

As a result, cutting-up broiler carcasses and marketing them as chicken in parts increases the enterprise income. The differences determined in comparisons made between groups and between methods of cutting-up have been found significant from the statistical aspect (p<0.01).

It may be considered to sell the small ones, among the carcasses included in the groups that ensure an income increase under the average, as a whole carcass without cutting-up and to use the carcasses weighing 2000 g and above in the production of chicken products (salami, sausage, ham, schnitzel, meatball, etc.) and to sell in this way.

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