

Structure Conduct and Performance of Poultry Market in Some Selected Area of Addis Ababa, Ethiopia

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Abstract
This article investigated the structure conduct and performance of poultry market in some selected area of Addis Ababa, using survey data 2017/18. The study used the structure-conduct-performance model. The data were generated by individual interview using pre-tested semi structured questionnaires and take a total of 100 farmers sample and 75 traders. This was supplemented by secondary data. Concentration ratio and gross margin were used for this analysis. Following the four firms' criteria of concentration ratio, Addis Ababa poultry market showed tight oligopolistic behavior in bird market and loss oligopoly in egg markets with 64.4 and 24.90 percent concentration ratio respectively. The maximum total gross marketing margin in bird and egg trading channel were about 53 and 41 percent respectively in channel XI and the highest producers share for bird and egg marketing were along producer- consumer. The findings suggests that, effective market information service has to be established in addition, emphasis should be given in reducing the level of oligopolistic nature of bird market and the government set strategies that improve competitiveness and efficiency of poultry market.
Keywords: poultry market; Structure conduct performance; Concentration ratio; marketing margin; oligopoly
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1. Introduction

Agriculture is the main economic activity in Ethiopia and more than 80% of Ethiopian population is dependent on agriculture of which livestock plays a very important role (Duguma *et al.*, 2012). Livestock contributes about 20% of the GDP, supporting the livelihoods of 70% of the population and generating about 11% of annual export earnings (SPS-LMM, 2010). It is the source of many social and economic values such as food, draught power, fuel, cash income, security and investment in both the highlands and lowlands/pastoral farming systems (FDRE, 2010).

Poultry is the most important species for generating income for poor peri-urban, urban and rural households (Van, 2016). Now a day, the demand for eggs and poultry meat has significantly increased across large parts of the continent Africa including Ethiopia (WHO, 2010). It is estimated that the consumption of poultry meat and eggs will increase by 200% between 2010 and 2020 for at least some countries in Sub-Saharan Africa (USDA, 2013). To meet up the increasing demand, efficient marketing system is needed for availability of product supply at a fair price and to encourage higher production (Omar *et al.*, 2013).

Marketing is an important aspect of any livestock production system. It provides the mechanism whereby producers exchange their livestock and livestock product for cash. The cash is used for acquiring goods and services which they do not produce themselves, in order to satisfy a variety of needs ranging from food items, clothing, medication, and schooling to the purchase of breeding stock and other production inputs and supplies (Alemu, 2010).

Urban poultry production, consisting of a large number of small scale farms, and a few medium to large scale poultry farms, is concentrated mainly in and around the major towns of the country like Addis Ababa, Bishoftu and Adama areas (Vernooij *et al*., 2012). In order to obtain the required benefit from untapped potential of the poultry sector through commercializing, marketing skills need to be further developed, based on additional market research works

1.2. Statement of the Problem

Ethiopia ranks first in Africa and tenth in the worldwide with respect to the livestock population. However, there are a number of fundamental constraints underlie these outcomes. These include poor marketing infrastructure, lack of marketing support service, lack of market information traditional technologies, limited supply of inputs (feed, breed, stock, water), poor or non-existent of extension service, high diseases prevalence, and limited credit services affect the livestock marketing conditions (Berhanu *et al.,* 2010).

Livestock products particularly poultry products have sky rocketing demand throughout the world. It is widely recognized that an inefficient marketing system entailing substantial costs to consumers and less incentives to producers could not provide the mechanism to meet the accelerating demand for high quality food items (Fafchamps, 2014). Similarly in the capital of Ethiopia, Addis Ababa, there are high demands and potentials of poultry products but, low marketing performances (Azage n.d.).

Past research works in Ethiopia conducted mainly in rural part of Ethiopia (Mekonin, 2007, Awol, 2010,

Dawit, 2010, Meseret, 2010 and Thilahun 2013) and some researches were also conducted in Addis, which was largely concentrated on impacts of HPAI (high pathogenic avian influenza) on poultry value chain actors, on exotic egg product market and waste management system (Gezahegn, 2010, Azage *et al*., n.d. and Nebyu *et al*., 2016). However, little has been said on marketing efficiency.

1.3. Objective of the Study

i. To show the poultry marketing structure
ii. To identify the conduct and performance poultry market in the study area.

3. MATERIALS AND METHODS

3.1. Description of the Study Area

The study was conducted in Addis Ababa, Ethiopian. Administratively, the City is having three layers of government: City government, Sub-city administrations, and District (Woreda) administrations. The City has divided into 10 sub-city administrations. Addis Ababa is situated at a latitude of 90 3' North and 380 43' East and an altitude of 2408 meters above sea level. The total human population was estimated to be 3,273,000 consisting 1,583,000 men and 1,690,000 women with 3.8% annual growth rate (CSA, 2013). 16,602 numbers of people in the city were engaged in agriculture. The city dwellers participate in cultivation of gardens and in animal husbandry including poultry. The poultry population in Addis Ababa is about 350,000 where most of the chicken is raised on small scale level in the backyards.

3.2. Data Sources and Methods of Data Collection

For this study both primary and secondary data sources were used. Primary data was collected from samples of the respondents using two types of semi-structured questionnaires develop both for the smallholder farmers and for traders. Secondary data were collected from different sources.

3.3. Sample Size and Procedure

The urban poultry farmers were selected using a two-stage sampling technique. The first stage involve purposive selection of five sub-cities out of the ten sub-cities based on the practice and the availability of small scale intensive poultry farms in those areas. Accordingly, Gullele, Bole, Nifasilk-lafto, Akaki-kality and Yeka sub-cities were selected for this study. In the second stage, small scale intensive urban poultry farmers were listed in consultation with the respective sub-cities urban agriculture experts and selected randomly from the list of urban poultry farmers from each select sub-city. The sample size (N) was determined using the formula recommended by (Arsham, 2007) to obtain a sample size of 100 small scale intensive urban poultry farmers with the assumption of 5% SE. The marketing information was also collected randomly selected 27 and 48 market participants (traders) in chicken and egg markets respectively and the choice of them is based informal discussions with key informants in the marketing system.

$$N = {}^{0.25}/_{SE^2}$$

Where: N: number of sample,
SE: standard error

Table 1 Sample size distribution among selected sub city of the study area

Sub-city	Small scale poultry farmers' (N)	Proportion to Total	Actual sample size
Gullele	124	0.21	21
Bole	102	0.17	17
Nifasilk-Lafto	130	0.22	22
Akaki-Kality	140	0.24	24
Yeka	98	0.16	16
Total	594		100

3.4. Methods of Data Analysis

3.4.1. Descriptive statistics

Market Structure: This study adopted concentration measure (CR) to analyze the degree of trader's concentration in sample market places in performing the exchange function.

$$CR = \sum_{i=1}^{r} Si \ldots\ldots\ldots\ldots\ldots (1)$$

Where

C=is concentration ratio, Si =is the percentage share of the all firms and r=the number of the largest firms for which the ratio is to calculated.

Kohls and Uhl, (1985) bring into play as a rule of thumb, four largest enterprises' concentration ratio of 50% or more (an indication of a strongly oligopolistic industry), 33-50 % (a weak oligopoly) and less than that (competitive industry).

Market conduct: Meijer, (1994) said that, "conduct is pattern of behavior which enterprises follow in adopting or adjusting to the market in which they sell or buy", in other words the strategies of the actors operating in the market. It is a systematic way to detect indication of unfair price setting practices and the conditions under which practices are likely to prevail. In this study market conduct were analyzed in terms availability of market information.

Market performance: The performance of an industry for a particular commodity can be evaluated in terms of technical and pricing efficiency. Marketing costs and marketing margins, influences on consumption, distribution and market access are best efficiency parameters to analyze the performance of a market.

Marketing margin: -Marketing margin was calculated taking the difference between producers and retail prices. The producers' share is the commonly employed ratio calculated mathematically as, the ratio of producers' price (ex-vessel) to consumers' price (retail) (Mendoza, 1995).

$$PS = \frac{P_X}{P_r} = 1 - \frac{MM}{P_r} \dots\dots\dots\dots\dots (2)$$

Where; PS= producer share

P_x= producers' price of poultry

P_r= retail price of poultry product which is consumer price of poultry

MM= marketing margin

Total marketing margin:- Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer and is expressed as percentage (Mendoza, 1995).

$$TGMM = \frac{Consumer\ price - Farmers\ price}{Concumer\ price} \times 100 \dots\dots\dots (3)$$

Where TGMM= Total gross marketing margin

Net Marketing Margin (NMM):- Is the percentage over the final price earned by the intermediary as his net income once his marketing costs are deducted. (ibid).

$$NMM = \frac{Gross\ Margin - Marketing\ Cost}{Consumer\ Price} \dots\dots\dots (4)$$

Market cost:- This include handling cost, transportation cost, production loss, storage cost, processing cost, capital cost, commission and other unofficial payments. Marketing costs and marketing margins, influences on consumption and distribution (Holloway and Ehui, 2002).

4. RESULTS AND DISCUSON

4.1. Structure, Conduct and Performance of Poultry Marketing System

4.1.1. Poultry market structure

The degree of market concentration ratio was used to evaluate the structure of chicken market. Four traders with the largest volume of chicken handled were used for the calculation at main poultry market places (Table 2)

Table 2 Chicken trader's concentration ratio

Number of traders	Cumulative frequency	Number handled	Total number	Market share (Si)	$CR = \sum_{i=1}^{4} Si$
2	2	19,200	38,400	19.2	19.2
2	4	14,500	29,000	14.5	33.7
1	5	12,000	12,000	6	39.7
2	7	12,000	24,000	12	51.7
1	8	11,040	11,040	5.5	57.2
1	9	10,000	10,000	5	62.2
1	10	9,600	9,600	4.8	67
1	11	9,000	9,000	4.5	71.5
1	12	6,600	6,600	3.4	74.9
2	14	6,000	12,000	6	80.9
2	16	5220	10440	5	85.9
9	25	2878	25,902	13	98.9
2	27	1056	2112	1.1	100.0
	27		200,094		

Source: Own computation (2018)

The results showed that the concentration ratio of poultry market in Addis market was 33.7% and this figure suggested that the market type is loose oligopoly market type. This is to mean the top four traders are controlling only 33.7 percent of the chicken market.

As can be seen from Table 3, the four firms' market concentration ratio for egg market was calculated and it was found to be 28.6 %, which implies that the market type is loose oligopoly. These less concentration ratios of egg market happened mainly because the poultry market transaction involved too many suppliers including large number of farmers directly selling their product to the final consumers. The poultry market in the study area is identified to have competitive market nature. It was also found to be less buyer's concentration. Hence, it is possible to conclude that egg market in Addis display the character of competitive market. The result indicated the relative competitiveness of the market.

Table 3 Egg trader concentration ratio

Number of traders	Cumulative frequency	Number handled	Total number	Market share (Si)	$CR = \sum_{i=1}^{4} Si$
1	1	444,000	444,000	9.6	9.6
3	4	289600	868,800	19	28.6
1	5	240,000	240,000	5	33.6
2	7	232,600	465,200	10	46.6
1	8	216,000	216,000	5	48.6
1	9	180,000	180,000	4	52.6
1	10	180,000	180,000	4	56.6
7	17	126,086	882,600	18.8	75.4
1	18	96,000	96,000	2	77.4
1	19	84,000	84,000	2	79.4
2	21	84,000	168,000	4	83.4
2	23	75,000	150,000	3	86.4
1	24	72,000	72,000	2	88.4
1	25	60,000	60,000	1	89.4
1	26	56,000	56,000	1	90.4
7	33	33,171	232,200	5	95.4
1	34	25,000	25,000	0.5	95.9
11	45	14,957	164,524	3.6	99.5
1	46	6,000	6,000	0.1	99.6
2	48	8220	16,440	0.4	100
	48		4,606,764		

Source: Own computation (2018)

Condition of entry and exit to live bird and egg trading

The barriers to entry is something that blocks or impedes the ability of the traders to enter into the market and the barriers to exit is something that blocks or impedes the ability of the traders to leave the market. Poultry traders

in Addis Ababa have entry barrier due to licensing procedure, associated cost incurred, information access, and price and demand fluctuation. In addition, poultry market participation startup capital or credit requirements are the other pre-supposed entry barriers since participation in poultry market require an individual to allocate starting up capital which range between 1500 ETB to 75000 ETB for chicken trader and range between 1000 ETB to 77000 ETB for egg trader. The other entry barriers for chicken processors were quality of storage materials, the spice added to make it fresh, and packing materials were the main factor.

The other important factor that needs to be evaluated in the study of market structure is poultry market exit barrier. The finding of survey data reported that there is no requirement to meet by poultry traders. In addition to this most of the poultry traders did not have a fixed investment such as fixed shop and the like associated with marketing and hence, the traders simply went out of the market without qualifying any requirement, so it was possible to conclude that there was no any exit barrier of poultry marketing

4.1.2. Market conduct

Market conduct refers to the market behavior of all firms. In what way do they compete? Are they looking for new techniques and do they apply them as practicable? Are they looking for new investment opportunities, or are they disinvesting and transferring funds elsewhere? Market conduct also deals with the behavior of firms that are price searchers and are expected to act differently than those in a price-taker type of industry (Abbott and Makeham, 1981; Cramers and Jensen, 1982).In addition, market conduct is also refers to the practices or strategies of traders in maximizing their profits. The market conduct of traders in the subsector have been analyzed using information like selling and buying behaviors and price setting strategy of sample traders. According to the survey results, about 33.33, 11.11, 48.15 and 7.41 percent of chicken traders reported that purchase price was set by negotiation with the suppliers, by their own, suppliers and market respectively. With respect to egg trading, about 12.5, 43.75, 10.42 and 33.33 percent of the sample traders reported that purchase price was set by their own, suppliers, the market and negotiation respectively.

Table 4 Chickens and eggs traders market conduct

Variables		Type poultry sold			
		Egg	%	Chicken	%
Buying price set by	Myself	6	12.5	3	11.11
	The seller	21	43.75	13	48.15
	Negotiation	16	33.33	9	33.33
	The market	5	10.42	2	7.41
Total		48	100	27	100
Selling price set by	Myself	11	22.9	5	18.5
	The buyer	0	0	2	7.41
	Negotiation	5	10.4	19	70.4
	The market	32	66.7	1	3.7
Total		48	100	27	100

Source: Own computation (2018)

It was found that chicken weight; color and age to be used as a means of grading live chicken. In this respect, the demand for red feathered cock found to fetch higher price especially during holiday time mostly for New Year, Ethiopian Easter and Christmas however, color matter little for those purchased for hotel, regular consumers and Muslim consumers. The age of a cock also found to be one of the factors determining the price of the cock and hen and it was determined by looking at the cock leg and feather of hens; older age found to negatively influence the price of cock and hen in Addis market. With respect to eggs market, it was found that there was no standard grade for eggs, however, small verses big eggs and local against exotic eggs sold relatively slight price difference. On the other hand, physically damaged and spoiled eggs usually end up priceless. Spoiled egg usually screened through eye check method.

Provision of better price than others and use of strong negotiation word power and various combinations of these two strategies are applied by most bird and egg traders to attract buyers and sellers. Regarding product differentiation, very few actors involved in processing function add values to alter the type of the product they serve for consumers.

Unlike bird trading, the price setting strategy in egg market is better in terms of price setting and information access. The price of egg is not that much volatile as in observed in live bird trading. According to the finding of the market survey, the price of egg is set earlier in the market day based on the price information in the some market. There are no significant variations in egg traders' response regarding egg traders' marketing behaviors (conduct measures) among the sample respondents as in observed by live bird marketing participants.

4.1.3. Performance of poultry marketing system

Marketing performance is calculated in terms of cost and margin for the following actors and marketing channels.

Chicken Marketing Channels

Channel I Framers → Consumers (2%)
Channel II Farmers → Retailers → Consumers (11%)
Channel III Farmers → Urban collectors → Retailers → Consumers (18%)
Channel IV Farmers → Urban collectors → Consumers (5%)
Channel V Farmers → Urban collectors → Processors → Consumer (18%)
Channel VI Farmers → Processors → Consumers (13%)
Channel VII Farmers → Rural traders → Urban assemblers → Consumers (6%)
Channel VIII Farmers → Rural traders → Urban assemblers → Retailers → Consumers (12%)
Channel IX Farmers → Rural traders → Urban assemblers → processors → Consumers (15%)

Egg Marketing Channels

Channel I Framers → Consumers (7%)
Channel II Farmers → Retailers → Consumers (8%)
Channel III Farmers → Wholesalers → Consumers (9%)
Channel IV Farmers → Wholesalers → Retailer → Consumers (13%)
Channel V Farmers → Collectors → Wholesalers → Retailer → Consumers (21%)
Channel VI Farmers → Collectors → Wholesalers → Consumers (16%)
Channel VII Farmers → Collectors → Retailers → Consumers (12%)
Channel VIII Farmers → Rural Famers trade → Ur-Retailers → Consumers (3%)
Channel IX Farmers → Rural farmers traders → Wholesalers → Retailers → Consumers (6%
Channel X Farmers → Rural traders → Wholesalers → Consumers (5%)

Marketing costs of traders

Information was collected on the various costs incurred in the process of assembling, transporting and selling poultry purchased. These costs outlays are referred to as marketing costs. The marketing cost of live bird and egg trading for varies marketing stages is calculated and depicted in Table 5 and 6. In live bird trading the highest average marketing cost of varies trader category is registered by cost of chicken death, labor cost and distribution cost each costs 1.25 birr/bird, 1.2 birr/bird, and 1.2 birr/bird. The loss cost is mainly due to diseases. Feed and water cost, transportation costs, rent, and loan cost are worthwhile to be mentioned as they have significant contribution to the transaction cost involved in chicken trading. Urban assemblers and processors incur the highest marketing cost in bird trading business accounting 19.7 and 14.7 birr per bird respectively. The average transaction (marketing) cost in the flow of bird from the point of production to the final consumer is 9.5 birr/bird.

Table 5 Marketing cost of bird marketing system

Cost of marketing	Agents					
	Urban collectors	Urban assemblers	Processors	Retailers	Rural Trader	Mean
Personal transport	0.03	0	0	0.01	0.2	0.05
Feed and water cost	0.17	2.5	0.1	0.7	0.5	0.8
Transportation cost	0.08	1.2	0.23	0.09	0.09	0.34
Labor cost	0.2	1.1	2	0.09	0.4	1.2
Distribution cost	0.2	4.7	0.15	0.07	0.3	1.2
Overhead cost	0.12	1.1	3	0.04	0.1	0.9
Cost of chicken death	0.5	4.3	1	0.2	0.23	1.25
Tax and license cost	0	0	2.8	0	0	0.6
Rent	0	0.04	3.3	0.06	0.04	0.7
Brokerage	0	0	0	0	0.07	0.014
Loan	0	0.3	1.2		3.5	1
Telephone	0.02	0.001	0.013	0.03	0.05	0.02
Cost of chicken/m	1.02	2	0.85	0.09	1.2	0.82
Feed cost	0.17	2.5	0.1	0.07	0.2	0.6
Total cost	2.51	19.74	14.74	1.45	6.9	9.5

Source: Own computation (2018)

Table 6 revealed that the cost of pullet, loss cost and transportation cost constitute the greater portion of the total marketing cost of egg accounting 0.2 birr/egg, 0.1 birr/egg, and 0.06 birr/egg each.

The average marketing cost in eggs trading in all traders category is about 0.57 birr per egg. Out of whom wholesalers, collectors and retailers incur the highest marketing cost in the flow of eggs from the point of production to the end users accounting 0.9, 0.6 and 0.5 birr per egg respectively. Higher marketing cost by actors in marketing channels reduces the relative competence of the marketing channel in the market chain.

Table 6 Marketing cost of egg marketing system

Cost of marketing	Agents				
	Urban collectors	Urban WS	Retailer	Rural traders	Mean
Personal e xpense	0.03	0.007	0.0032	0.014	0.014
Transportation cost	0.02	0.08	0.1	0.03	0.057
Labor cost	0.04	0.05	0.03	0.043	0.041
Distribution cost	0.03	0.05	0.04	0.021	0.035
Overhead cost	0.02	0.02	0.06	0.01	0.028
Loss	0.05	0.2	0.08	0.09	0.105
Rent	0.004	0.04	0.003	0	0.012
Brokerage	0.006	0.003	0.001	0.08	0.023
Egg handling	0.05	0.04	0.035	0.005	0.033
Telephone	0.06	0.004	0.002	0.01	0.019
Cost of egg	0.3	0.4	0.1	0.01	0.203
Total cost	0.61	0.89	0.45	0.31	0.57

Source: Own computation (2018)

Marketing margins in bird and egg marketing chain

Marketing margin is the percentage of the final weighted average selling price taken by each of the marketing chain. The margin must cover the cost involved from one stage to the next and provide a reasonable return to those doing the marketing. Marketing costs and margins were calculated for main agents in the marketing channel such retailers, collectors, assemblers, processors, wholesalers and rural traders. Table 7 summarizes marketing margins maintained by each actors in varies bird and egg marketing channels.

Total gross marketing margin in bird trading is highest in channels, IX, VI, V, VIII and VI they account a TGMM of 53.12%, 51.9%, 50.9%, 47% and 44.44%, of the consumers' price. Processors enjoy the highest net marketing margin that is 47.6% in channel VI followed by urban collectors, urban assemblers and retailers maintain a NMM of 29.7%, 26.5% and 20.8% in channel IV, VIII, and II. Producers share from the price paid by consumers is highest in channel I, which accounts 100% of consumer's price, followed by channel II and channel IV which accounts 78.7% and 70.7% of the price paid by consumers. The lowest net marketing margin is associated with rural traders in channel VII, VIII, and X of bird marketing chain.

Table 7 Marketing margin maintained by marketing actors in bird and egg marketing chain

Bird trader	I	II	III	IV	V	VI	VII	VIII	IX	X
TGMM		21.3	34.6	29.3	50.9	51.9	44.44	47	53.12	
NMMcol			28.32	29.7	27.4					
NMMas							25.1	26.5	26.1	
NMMp					27.4	47.6			14.15	
NMMret		20.8	6.9						5.5	
NMMrutr							14	14	14	
GMMp		78.7	65.4	70.7	49.1	48.1	55.6	53	46.9	
Egg traders										
TGMM		33.33	28.20	30	38	29.9	32.5	37.5	41.18	36.70
NMMrt		23.33		10	2.3		1.25	7.5	2.35	
NMMws			10.26	6.67	3.85	1.30			1.27	1.27
NMMcol					9.32	9.32	9.32			
NMMrur								13.54	6.33	6.33
GMMp		66.67	71.80	70	62	70.1	67.50	62.5	58.82	63.30

Source: Own computation (2018)

The highest producer share is observed in channel III of egg marketing chain that is 71.8% out of the price paid by consumers. The highest net marketing margin in egg marketing chain is observed in channel II by the retailers that is 23.33%. The lowest net marketing margin in egg marketing chain is observed in channel VI and X that accounts 1.3% each and this is maintained wholesaler. The marketing margin analysis of the subsector revealed that producers share and net marketing margin maintained by varies chain actors are remarkably varied across the different marketing channels.

5. CONCLUSIONS AND RECOMENDATIONS

5.1. Conclusions

Several intermediaries are involved in poultry marketing at different levels. Producers, wholesalers, collectors,

assemblers, rural traders, processors and retailers are all identified poultry market role players.

Regarding the structure of live bird and egg marketing system in Addis (wereda) show that marketing systems are fairly concentrated in terms of few firms' domination. Lack of information on price, supply and demand, low or lack of financial access, high startup capital, color of poultry hold, types of eggs and short and inconsistent supply of live bird and egg are among the most influential entry barriers in all sample markets mentioned by sample traders. This indicating that how the existing structure of marketing system affects the conduct of marketing actors and hence the performance of the entire marketing system. Thus there is a need to improve the marketing structure by creating competitive actors that involved in different value adding activities.

Cost of pullet, loss cost and transportation and distribution cost constitute the greater portion of the total marketing cost. Total gross marketing margin in bird trading is highest in channels, IX, accounts 53.12% of the consumers' price. Processors enjoy the highest net marketing margin that is 47.6% in channel. The lowest net marketing margin is associated with rural traders in channel VII, VIII, and X of bird marketing chain while, the highest net marketing margin in egg marketing chain is observed in channel II by the retailers that is 23.33%. The lowest net marketing margin in egg marketing chain is observed in channel VI and X that accounts 1.3% each and this is maintained by wholesalers. This implying that there is no equal distribution of profits among traders. Therefore the performance of poultry market in Addis market is seems to be inefficient.

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