



## Factors affecting table Egg Marketing and Consumer Attitude in Khartoum State

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Received: January 2020

Accepted: February 2020

### Abstract

This study was conducted during the period November – December 2015 and January 2016 to assess some main factors in the marketing chain that have impact on table egg marketing in Khartoum State and on the consumer attitude in the direction of table egg demand. This was through assessing the knowledge and exploring of grocers and the consumer opinion on table egg marketing, egg quality and standard throughout the marketing channel flow. A random sample of 60 from the Central Markets, 90 from groceries and 150 consumers were selected. Questionnaires, interviews and personal observation were used. Data was collected on personal characteristics, seasonal effect, marketing activities, egg handling, feasibility and reasons for business selection. Data was analyzed by simple percentages, Anova and correlation. The main findings were. Business group 20 – 30 years at 43%, education 51.1 secondary, site ownership renting at 51.6 financing 66.7% mainly personal, the source of table eggs purchase source was mainly companies at 48.3%. Base of egg purchasing 66.7% for size, sale display 50% in open veranda and seasonal effect was high for both summer and winter at 83.3% each. Sale display 33.3% was open veranda in the groceries, the price was determined on supply and demand factors at 33.3% and fixed price at 27.8%. Purchase preference was mainly external appearance at 23.3% and 17.8% for each of shape and stamp. The source of egg was farms at (48.9%) and companies (46.7%). For site ownership renting ranked first 45.6% Anova between site ownership and quantity of daily sales was NS (P0.466). but significant for purchase price (P0.021) and for sale price (P0.006). Transportation to groceries was mainly company cars at (31%) and pick up cars at (24.4%). Storage period was mainly 2–7 days in open veranda and for egg quality 24.4% of the respondents lacked information. Consumption was by all age groups but less for elderly and females. Main source of table eggs was groceries at 66.7 % and Central markets at 20.7%. For size 72.3% preferred , medium, for cooking, 65.3% preferred boiled eggs and for meal preference 38% for breakfast and 24.6% all meals, and for seasonal preference 29.4% autumn and 12 % summer.

The study concluded that the majority of the study respondent in the table egg marketing chain knowledge on quality standards merchandising depended on personal judgment rather than recognized standards. Display methods, storage, transportation were not correctly attended to. Site ownership and personal experience had significant effect on both purchase and sale price.

The study noted absence of any organized or authorized body controlling guiding or directing table egg flow in the marketing chain.

**Keywords:** Attitude- Knowledge – Marketing – Channels – Quality.

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## Introduction

Adoption of consumer-market oriented egg production for profit maximizing is the needed trend for the egg industry boosting and booming future.

Ascertaining profit in egg production is a complex matter ranging from the hatchery to production and to marketing and distribution. The retail market is consumer driven and it is important for the grocery owner to know the most preferable and profitable specific characteristics desired by the consumer for product size and quality.

The retail market demand specific good high quality product and pays premium price for that and so does the consumer for the specifications of the product they expect.

One of the most important aspects of economics is to be demand oriented. Marketing style causes cost differences and return profit changes and marketing channels orientation is one main factor of that.

The research problem will then be to assess the effect of presentation and handling on egg quality through the marketing chain using quality standards and measurements and marketing directions for assessment of the negative impact of the traditional marketing system on egg quality and trading.

Kramer (1951) defined quality as "the sum of characteristics of a given food item which influences the acceptability or preference of that food by the consumer.

Hernandez et al. (2000) stated that consumers defined egg quality through the observable characteristics such as shell strength, albumen consistency and yolk colour.

Forbis (2002) considered egg quality as yolk colour shell cleanliness, albumen quality and egg weight in this order as the most important quality factors for the consumer; in addition to shell thickness and yolk size, colour being not important.

Coutts et al, (2006) stated that egg quality is a general term that refers to several standards that define both internal and external quality.

Internal quality refers to egg white (albumen) cleanliness and viscosity, size of the air cell, yolk shape and ratio. External quality is defined as texture, colour, soundness, cleanliness, shell shape, shell should be smooth clean free from cracks and uniform in colour in addition to egg size and shape.

Kamil (2005) stated that egg quality starts from the farm and on set of lay, egg collection and up to the consumer. Steps that lead to the upkeep of egg quality should be considered including good farm management, all time balanced feed, frequent collection, package, transportation, storage, processing and the marketing channel.

FAO (2003) Food and Agricultural Organization stated that grading and standardization consist of arranging produce into a number of uniform categories according to physical and quality characteristics of economic importance. It is a process of identification, classification and separation.

The main marketing channel in the egg industry chain includes producers, collectors, assembly merchants, whole sale dealers, retailers and the consumer,

Retailers include, Poultry shops, Food shops (Mixed Food Products in rural and urban areas) and Supermarkets (Mixed Food Products in urban areas) .

This study was conducted to assess some main factors in the marketing chain that have impact on table egg marketing in Khartoum State and on the consumer attitude in the direction of table egg demand. This is through assessing the knowledge and appreciation of the groceries and the consumer opinion on table egg marketing, egg quality and standard through the marketing channel flow.

### Materials and Methods

This study was conducted in Khartoum State. Two study populations were investigated:

1. Egg buyers at groceries, central markets and supermarkets.
2. Consumers in the three towns.

### Central Markets

During the period November – December. 2015 and January. 2016 sixty egg traders were randomly selected taking twenty traders from each of the three Central Markets in (Khartoum State). Equal numbers were selected from each market considering the similar marketing activities between the traders and among the consumers. Also considering the heterogeneity of the three markets, Khartoum being more urbanized, Omdurman the most populated among the three towns and Khartoum North harboring most of the farm units.

Questionnaires, interviews and personal observations methods were used for the study. Data was collected on personal characteristics, marketing activities, egg handling, and seasonal effect on marketing activities, feasibility, and reasons for business selection.

### Groceries

Using the above, mentioned, considerations and the ratio of population of each town to the total population of Khartoum State around (5274321) Fifth Population Census, 2008) (the only available data) a total of 90 groceries was selected comprising 40 in (Khartoum), 30 (Omdurman) and 20 (Khartoum North).

Field wise these numbers of groceries were, then randomly selected from the four geographical directions and the center of each Locality.

Questionnaires, interviews and personal observations were used for collecting data on personal characteristics, commercial and marketing activities, pricing and selling, egg handling and consumer complaints and preferences during the period February through April 2016.

### Consumers

Using the population ratio of each town to the total of Khartoum State population percentage (1980) population census) a total of 150 consumers was used for the study at the ratios of 42% (Omdurman), 30% (Khartoum) and 28% (Khartoum North) comprising 63,45 and 42 consumers respectively (during the period May, July 2016). Parameters studied were consumer attitude, preferences, information on egg quality and knowledge and information on Sudan Standards and Metrological Organization (SSMO) Data was analyzed by simple percentages, Anova and correlation using Spss version 16.

## Results and Discussion

### Central Markets

Data on central markets information included personal characteristics and commercial activities. The main findings were for age groups in the business 20 – 30 years at 43% for education secondary level at 51.1%, for site ownership renting at 51.6% , 35 %

sharing for commercial activity 40% company agents, 23.4% distribution agents 20% small dealer and middle men at 13.3% each. For financing source personal was at

66.7 % joint and bank loan were at 16.7 % each .Table egg purchase source was companies at 48.3% and bases of purchase are shown on the following table.

**Table (1):**

**Consumer’s bases of purchasing table egg**

Bases	frequency	percentage
Size	40	66.7
Price	10	16.7
Outer appearance	10	16.7
Total	60	100

Egg size ranked best at 66.7% .for base of purchase

Egg size ranked first followed by price which are generally and globally the accepted bases

**Table (2):**

**Sale display methods of table egg**

method	Frequency	Percentage
Open veranda	30	50
Ground	10	16.67
Glass surface	8	13.33
Refrigerated	7	11.67
Cool room	5	8.33
Total	60	100

Open veranda comprised 50% of total sales

Open veranda ranked first which might expose eggs to damage and deterioration especially those transported by open cars.

Prices were high at 83.3% for both summer and winter but for Autumn the figure was 61.3% and acceptable at 33.3 % without offering any convincing reason but probably for more supply and demand in winter and less supply in summer.

**Groceries**

The sale display method was 33.3 % in open veranda, 24.4% Food Shops 21% refrigerators, 13.3 ground and 7.8 % glass surfaces. Here again open veranda makes the bulk as in central markets which predisposes Eggs to unsuitable environmental conditions.

Table (3):

**Factors affecting table egg price assessment**

factor	Frequency	Percentage
1. Supply and Demand	30	33.3
2. Fixed price	25	27.8
3. Season	21	23.3
4.Price competition	14	15.6
Total	90	100.0

Supply and demand ranked highest percent in price assessment.

Supply and demand topped at 33.3 % and price competition came last at 15.6% of the respondents.

**Table (4):**

**Consumer preference bases of table egg**

preference	Frequency	Percentage
1. External appearance	21	23.3
2. Shape	16	17.8
3. Company	16	17.8
4.Colour	13	14.4
5. Farm	10	11.1
6.Appearance	7	7.8
7. company	5	5.6
8. Egg cleaning	2	2.2
Total	90	100.0

Purchase preference base was mainly on external appearance shape and stamp.

External appearance ranked first at 23.3% while egg cleaning last at 2.2% which indicates hygienic hazard for both the egg product and human health and indicates absence of the responsible authorities

specially SSMO (Sudan Standard Metrological Organization) and health inspection.

This rating differs from Forbis (2002) who stated that the consumer preference factors in order are yolk colour, shell cleanliness, albumen quality and egg weight in addition to shell thickness and yolk size, Shell colour being not important.

Preference comes within the range of external quality factors as defined by Coutts

et al. (2006) as texture, colour, smoothness, cleanliness and shell shape.

The preferred colour was white at 73.6% level and brown at 21.1%. Preferred purchase method was by dozen at 41.1% followed by tray (30 eggs) at 36.7%. The sale method was at 62.2 % for by dozen and 14.4% for by tray.

**Table (5):**

**Groceries' source of eggs**

source	Frequency	Percentage
1. Farm	44	48.9
2. Company	42	46.7
3. Company Agent	4	4.4
Total	50	100.0

Majority 95.6% purchased eggs from farm and companies

The two main sources were the poultry farms and poultry companies in almost close percent ratios.

Analysis of variance (ANOVA) between source of purchase and quality of daily sales showed no significance (P value (0.099) and Table (6)

P (0. 297) for source of purchase and price of purchase and P (0.363) between source of purchase and price of sale. Purchase source showed no statistical significant effect on table egg marketing through the marketing channel flow.

**Analysis of variance between site Ownerships and daily sales. Purchase price and sale Price.**

Site Ownerships	No	Daily sale		Purchase Price		Sale Price	
		Mean ± Std	P. Value	Mean ± Std	P. Value	Mean ± Std	P. Value
Private	16	34,44 ± 34,06	0,466	30,69 ± 7,097	0,021	34,13 ± 8,717	0,006*
Renting	41	46,61 ± 41,62		32,68 ± 7,292		36,27 ± 9,729	
Sharing	21	37,76 ± 42,81		37,71 ± 7,309		42,33 ± 9,926	

Government Assignment	12	60,75 ± 82,25		31,83 ± 8,133		29,92 ± 12,80	
Total	90	44,47 ± 47,84		33,39 ± 7,671		36,46 ± 10,61	

\* = P < 0.05, \*\* = P < 0.01, NS = Not significant

Site renting ranked first at 45.6 % of Ownership and government assignment least 13.3%. ANOVA between site ownership and quantity of daily sales was (NS) P(0.466) but was significant P (0.021) between site ownership and price of purchase and sale price (P0.006). These results indicated significant effect of site ownership on both prices of purchase and sale.

Site ownership affected significantly both price of purchase and price of sale of table eggs in the groceries.

For egg transportation to groceries by company cars was at 31%, open cars 24.4% chilled vehicles at 20%. Open cars are hazzard for up - keep of egg quality and for possible damage. FAO (Food and Agriculture Organization 2003) stated that producers, wholesalers and retailers must move eggs to consumers fast to avoid delays in all distribution channels as a primary consideration determining marketing arrangement.

For the role of (SSMO) for egg quality control and table egg marketing 74.4% indicated no role other than publication and some training at 15.6%.

Manahil (2011) in a Survey in Khartoum State found that quality requirements provided by (SSMO) standards for table eggs varied a lot among Khartoum Localities especially for eggs stored at different temperatures. This study confirms these finding as 27.8% of the grocery owners

stated that they have no information on (SSMO) which indicates leakage in contact and information delivery.

For type of commercial activity 94.4% were company agents and 5.6% small dealers. The interest in continuity in the job 54.4% answered positively and 45.6% negatively which necessitates more in depth study for encouragement of others to go into the business.

Site ownership showed statistically significant effect on both purchase and sale of table eggs in the groceries.

Storing period was 2 days for 23.3% for 7 days 23.8% and for 14 days 17.8%. The majority of respondent grocery owners stored for 2 – 7 days. Storage was mainly in open verandas under unsuitable environmental conditions which might speed up quality deterioration unless fast marked.

Samli (2005) reported that eggs should be stored under 15 °C and 80% relative humidity. Jocobbot et al, (2003) noted that fresh eggs are laid with best quality but storage conditions affect quality negatively specially temperature, humidity, air movement and prolonged storage period as is predicted here in Khartoum State. Abd Elwahid (2002, Halaj et al, 2000, Scott and Silverside 2000) stated that storage time and dirt have negative effect on egg quality\ characteristics.

Absobayel and Albadry (2010) in Riyadh area in Saudi Arabia found that storage period had a significant (P ≤ 05) adverse

effect upon Haugh unit (HU) values, specific gravity, and air cell depth and shell thickness; storing in veranda strengthens these negative effects.

On information on egg quality 24.4% stated lack of information and knowledge. Correlation between price of sale and experience period indicated high significance

P (0.000) but between daily sales and experience period P value was (0.694) NS.

**Consumers**

For egg consumption all ages answered positively, more so for 20 -50 years and less so for elderly people. Sex-wise male consumers were at 61.4 % and females 31.6% in dictating sex difference in consumption.

**Table (7)**

**Consumer preference source of table eggs**

Source	frequency	percentage
Groceries	91	66.7
Central market	31	20.7
farms	28	18.7
Total	150	100

Mostly groceries at 66.7% level.

For the preferred edible size a majority of 72.3% preferred the medium size but not sticking to numerical weight values as stated by (SSMO) or any other authority as was also found by Manahil (2011). The preferred Yolk colour was yellow for 44% deep yellow 25%

and 24% faint yellow. For egg quality of displayed eggs 13.4 % stated high, 16% low 36.6 acceptable and 36% do not know.

For cooking preference 65.3% preferred boiled and 34.7 pan cooked.

**Table (8)**

**Egg Meal Preference**

Preference	Frequency	Percentage
Breakfast	57	38
All meal	37	24.6
Lunch	34	22.6
supper	22	14.6
Total	150	100

Most respondents preferred breakfast meal.



For egg preference by season 29.4% for autumn 26% winter , 12% for summer and 30.4% for all the years round.

Patil et al, (2005) and Bejaei et al, (2011) noted that consumer, preferences and perceptions varied, the main factor being lack of information of the importance of egg as a source for human diet and health and perception of the nutritional value influences consumer egg selection. Consumer's belief is important as many consider that free range, free run and organic eggs are of higher nutritional value and that brown eggs are of higher nutritional value than white eggs. In Sudan consumers prefer white eggs to brown eggs, mainly colour preference than for any other reason.

Atsobayel and Albadry (2010) stated white shelled eggs had significantly higher weight surface area, lower shape index and blood spots than the brown. Aida (2011) stated that the main objective of the marketing functions is a transfer of the product to the consumer within certain grades specifications and standards different from one community and the other according to regulations and legislations. The study showed lack of Sticking to or application of any regulations or legislation.

Moula et al, (2013) assessing quality of marked eggs in Algeria according to the marketing chain found that egg weight differed significantly between marketing chains.

Shell strength was similar for the chain and damaged eggs were higher in public markets, intermediate in food shops and lower in supermarkets, Yolk albumen ratio was significantly higher for supermarkets, intermediate in food shops and lower in public markets. Generally egg quality differed significantly in the marketing chain

but was of higher quality in supermarkets. This agrees with the finding of this study as most customers buy table eggs from groceries and super markets.

Bell et al, (2001) in the United States of America found significant age, (HU) weights and cracks between the States.

Brown and white, eggs differed relative to age but (HU), egg weight, shell weight and cracks were all statistically the same in all states studied.

Omer et al, (2013) in Bangladesh found different marketing margins between egg marketing chain and seasonal variation due differences in supply and demand. This also agrees with the finding of this study.

The African development Bank and the United Nations (2015) stated that a market system is composed of interconnected value chains that have common producers, materials and / or inputs (2) inter- connected systems that include the market and other systems such as the environment (Linkages to climate changes) health (Linkage to nutrition, the public sector) (Linkage to the business enabling environment) and (3) households and communities which are also systems that connect to markets as producers concluded that supermarkets showed better results than central markets which agrees with some studies in other countries and this study.

The study concluded that egg handling, transportation, display and presentation and storage systems in the marketing chain present potential hazzard to egg quality up - keep and protection from damage.

Consumer perception and attitude indicated lack of information and limited or no knowledge on egg quality and nutritional value and depended on personal judgment

rather than accepted recognized standards or to legislations to be applied.

### Recommendations

More research on food value of eggs is needed as a greater stimulus to consumption. This note is the main recommendation of this study. This is in addition to more elaborate diffusion of information on egg quality standards specialty by SSMO and the related inslitiutions and extension departments related to.

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### بعض العوامل التي تؤثر على السلسلة التسويقية لبيض المائدة و اتجاهات المستهلك بولاية الخرطوم

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#### المستخلص

تمت دراسة بعض العوامل التي تؤثر على السلطة التسويقية لبيض المائدة في ولاية الخرطوم في الفترة ديسمبر 2015 ويناير 2016 لتحديد بعض العناصر الرئيسية في سلسة التسويقة والتي لها أثر على تسويق بيض المائدة بولاية الخرطوم وتوجهات واتجاهات المستهلكين في اتجاه الطلب على بيض المائدة عن طريق تقييم المعارف وادراك ورضى أصحاب البقالات ورأي المستهلكين عن تسويق البيض والجودة والمعيار القياسي في منظومة انسياب سلسلة تسويق البيض، ثم اختياره لعينة عشوائية من الأسواق المركزية و 90 من البقالات و 150 من المستهلكين وتمت الاستعانة بالاستبيانات والمقابلات والملاحظات الشخصية في جمع البيانات عن الخصائص الشخصية، التأثير الموسمي، المناشط التسويقية، معادلة البيض، الجدوى الاقتصادية وأسباب اختيار نوعية العمل و ثم التحليل الاحصائي عن طريق النسب المئوية السببية والتباين الاحصائي والارتباط وكانت أهم النتائج كالاتي:

### الأسواق المركزية:

تراوحت أعمار العاملين بالأسواق المركزية بين 20-30 عاماً بنسبة 43% وفي جانب التعليم كانت بنسبة 51.6% المستوى الثانوي ومصدر التمويل شخصي بنسبة 66.7% والمصدر الرئيسي لشراء البيض كان الشركات بنسبة 48.3% والقاعدة الشرائية للبيض بنسبة 66.7% كان بالحجم وأما بالنسبة للعرض فنسبة 50% في فرندات مفتوحة وأما لتأثير الموسم على القوة الشرائية أفاد 83.3% بأنها مرتفعة صيفاً وشتاءً.

### البيانات:

ما توصلت الدراسة الى انه في البيانات يتم:

العرض بالفرندات المفتوحة كان بنسبة 33.3% وموقع المقر يحدده العرض والطلب وأن الأسعار ثابتة بنسبة 27.8% ولتحديد المفاضلة للشراء أفاد 33.3% بأنها المظهر الخارجي بينما أفاد 17.8% لكل من الشكل والخاتم ومصدر الشراء كان بنسبة 84.9% من المزارع و 48.7% من الشركات وملكية الموقع كانت بنسبة 45.6% ووضح التحليل الاحصائي للتباين بين مصدر الشراء والكمية المسوقة يومياً أنه ليس هناك فرق احصائي معنوي باحتمالية (0.99) وبينه وبين سعر الشراء باحتمالية (0.297) وبينه وبين سعر البيع باحتمالية (0.363) وتحليلي التباين بين ملكية الموقع وكمية البيض المباع يومياً أثبتت أن هناك فرق احصائي معنوي باحتمالية (0.021) وبينه وبين سعر البيع باحتمالية (0.006) كما أوضح تحليل التباين بين مصدر التمويل والمباع اليومي وسعر الشراء و سعر البيع أنه ليس هناك فرق احصائي معنوي باحتمالية (0.694) (0.342) و (0.205) بالتالي والتوالي، وسيلة الترحيل للبيانات كانت بسيارات الشركات بنسبة 31% وسيارات مفتوحة بنسبة 24.4% وفترة تخزين البيض تراوحت بين 2-14% يوميا وفي فرندات مفتوحة وأما بالنسبة للجودة فقد افاد 24.4% انهم يفتقرون للمعلومات.