

STUDY REGARDING THE EGG'S CONSUMPTION AND THE PERCEPTION REGARDING THE EGG'S QUALITY

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Abstract

The paper is based on the study of various reports and different type of articles regarding the EU egg's production and egg's quality. In order to determine the Romanian consumers' perception regarding the quality of the egg, a questionnaire was prepared which was completed during January-February 2019 by 124 people from Sibiu County. Egg purchase preferences show that 42% of people prefer eggs bought from peasants, 29% of people buy from the shop next to the house, while 29% of people buy eggs from the supermarket. The main motivation to consume eggs is for 58% of respondents the rapidity of preparation. More than 50% of people appreciate the eggs as tasty and only 29% see a source of protein of animal origin in egg consumption. Buyers are pretty well informed about the link between the coded egg and the hen's breeding system (54%). Sensory characteristics and nutritional value of foods are the factors on the basis of which consumers appreciate the quality of the eggs.

Key words: egg, quality, consumption, market, poultry

INTRODUCTION

The external quality of eggs is appreciated based on texture, colour, shape, health and hygiene of the shell. The egg shell must be integral, smooth, clean and free from cracks. They all must be homogeneous in colour, shape and size.

Market eggs must comply with these strict standards so that only high-quality products reach the consumer.

Consumers appreciate the quality of the egg in terms of the colour of the yolk and its colour variation in a batch of eggs. The colour of it is therefore an important criteria for appreciating the value of the egg.

Specialty literature states that in surveys conducted in different countries on egg samples of different colours, the interviewees showed pronounced interest to the most intense yolk colours. [17, 18]

The colour of the yolk on a hen's egg yolks is determined in particular by the content and type of carotenoids present in the food. As such, the level of carotenoids in it should be adjusted to match the colour preference of the consumers. Consumer perception about the colour of yolk depends on the geographical

area and traditions. They especially prefer egg with a more intense coloured yolk [9].

In order to produce the best possible quality eggs for buyers, we need to consider the yolk colour measurement, which is made using the (DSM YolkFan) colour standard, which is widely accepted in the food chain as the standard for measuring the colour of yolk.

The main sources of xanthophyll pigment are known: red corn, maize gluten and Lucerne. Carotenoid pigments can also be extracted from many other sources such as lobsters, daffodils, marigolds, fruits (pineapple, citrus fruits, pepper, insect, flamingo, canary), marine animals (crustaceans, salmon) and yeasts (*Phaffia rhodozyma*). [1, 4, 7, 10, 12, 13, 16] These pigments offer a wide range of different colours from light yellow to dark red. [8] Lutein from the xanthophyll pigment gives a yellowish colour while zeaxanthin from the xanthophyll pigment gives a yellow golden colour.

The yellow colour of the egg yolk can be induced by incorporating into the food ingredients such as corn, maize gluten, Lucerne and by adding natural or synthetic pigments or a combination of these types into it.

Different factors can affect the consumption of eggs: cultural or regional values, customer preferences, religious beliefs, etc. [14].

The countries which are leading when talking about the consumption of eggs per inhabitant are: Japan, Paraguay, China, Mexico, Ukraine, Malaysia, Brunei, Slovakia, Belarus and The Russian Federation [2].

The average egg consumption per inhabitant reached approximately 9 kg in 2013 according to Faostat [6].

MATERIALS AND METHODS

The paper is based on the study of various reports and different type of articles regarding the EU egg's production and egg's quality.

In order to determine the Romanian consumers' perception regarding the quality of the egg, a questionnaire was prepared which was completed during January-February 2019 by 124 people from Sibiu County.

The questionnaire was administered by a single interviewer and included demographic data on the respondents: gender, age, domicile, level of training and occupation of the respondents, number of family members, etc.

The goal was to know the traits consumers are looking for when buying eggs (frequency of consumption, place of purchase, average monthly consumption of eggs per person, importance of sensory aspects to appreciate the freshness of eggs, etc.).

The questionnaire was structured into 14 items: the frequency of egg consumption; monthly average family consumption of eggs; place of purchase; the table at which the eggs are consumed; the main motivation of egg consumption; knowledge of the nutritional value of the egg and of the link between the number recorded on the egg and the poultry rearing system; the aspects that influence the purchasing decision; egg size and yolk colour preferences; perception of the relationship between the colour of the yolk and the quality of the egg; perception of the relationship between the colour of the shell and the poultry breeding system; the motivation underlying the purchasing decision from local producers.

RESULTS AND DISCUSSIONS

Countries like China, U.S., India and Mexico are the leaders in egg market. The share of laying hens by housing system show that at the world level more than 90 % of hens are living in cages, 8 % in barns and only 2 % in free range systems [19].

On EU level, the share of systems for keeping laying hens is 55.6% in chicken coops, 25.7% in barns, 14.1% in free range, and 4.6% in bio systems [18].

The hen house of the U.E. was 390.7 million heads in 2016 and 526.5 million heads respectively in 2017 [5, 15].

The five countries with the largest number of hens in each housing system on the EU-28 level, in 2016, was: enriched cages (Spain, Poland, France, Italy, United Kingdom), barn systems (Germany, Netherlands, Italy, Sweden, Austria), free range (United Kingdom, Germany, France, Netherlands, Spain), organic (Germany, France, Netherlands, Italy, Sweden) [19].

According to the methods of production, the number of laying hens in 2017 by way of keeping was 53.2% enriched cages, 26.5% barns, 15.3% free range and 5.1% in organic systems. The data shows that in alternative systems there was a total of 186,064,310 laying hens (46.8%). The egg prices on the EU-28 level in 2017 was 128.06 EUR/100 kg [5].

According to the number of laying hens exploited in 2017, the countries with the largest flocks in the EU were: Germany (52.65 million heads), France (49.04 million heads), Spain (46.73 million heads), Poland (46.26 million heads), Great Britain (44.13 million heads) Italy (34.96 million heads), the Netherlands (34.32 million heads), Belgium (9.41 million heads), Portugal (9.22 million heads), Sweden (8.06 million heads).

These top 10 countries with the largest flocks of laying hens in the EU-28, exploited approximately 84.2% of herds of the member countries in 2017 (Fig. 1).

From the total of 7,528 (in 1,000 tonnes) egg production in 2017, the EU-28 main eggs producers (in 1,000 tonnes) were: France (13%), Germany (12%), Italy (11%), Spain

(10%), United Kingdom (10%), Netherlands (9%), Poland (8%).

In 2018 and 2019 the EU-28 countries remain the main exporters of eggs on world level.

In 2018 the EU-28 Member States exported eggs to Japan; Switzerland, Israel, Thailand, Taiwan, Mauritania, South Korea.

The European Consumer Association (BEUC) has indicated some characteristics that consumers are looking for in eggs. In recent years, there has been little research into consumer perceptions of egg quality. In Romania, such studies are even less conducted.

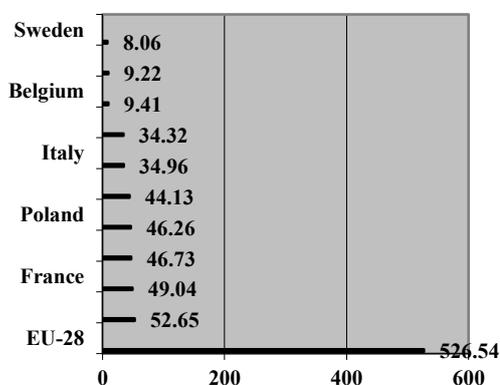


Fig. 1. The number of laying hens in the main EU countries in 2017 (million).

However, the data from consumer surveys conducted in recent years has brought us a lot of knowledge in this area.

In 2001, in Spain, such a study was conducted among 3,085 people. The purpose was to confirm the appreciation of the eggs according to the BEUC characteristics. The results of the survey showed that for consumers the most important attributes given to eggs are "safety", "freshness", "nutritional value" and "sensory characteristics".

With regard to "sensory characteristics", the results of surveys over the last 10 years in several European countries like France, Germany, Italy, the United Kingdom, Spain, Poland and Greece show that consumers appreciate a number of tangible characteristics of the egg. „Sensory characteristics” refer mainly to the resistance of the shell, the consistency of the white and the color of the yolk.

The visual evaluation of the egg provides quick information and links with the sensory perception of egg quality through the color of yolk.

The perception of Romanian consumers about the quality of the eggs. Case study Sibiu county

At the end of 2017, Romania with a flock of laying hens of 7.98 million heads, held the 11th position in the EU-28, while in 2016, with 8.2 million heads, occupied the 7th position [5, 15].

The questionnaire was structured in demographic data on respondents and 14 items. The questionnaire was completed by 124 people. The demographic data of the respondents are shown in Table 1.

Respondents' data show that 63% are women, and 37% are men.

Approx. 50% of people are 20 to 40 years old, 25% are between 41 and 60 years, 8% are over 60 years old, while only 17% are less than 20 years old. A share of 46% of those interviewed are high school graduates, 12% have graduated from a vocational school, 38% have higher education and 4% have only secondary education.

The family size of the interviewed is 4 in the case of 42% of the respondents, 2 in the other 33% and 25% have families of more than 4 people.

Table 1. The demographic data of the respondents

Gender (n=124 persons)		Age (n=124 persons)				Level of education (n=124 persons)				The family size (n=124 persons)		
Male	Female	Less than 20 years old	20 to 40 years old	Between 41 and 60 years old	Over 60 years old	secondary education	vocational school	high school	higher education	2 persons	4 persons	More than 4 persons
46	78	21	62	31	10	5	15	57	47	41	52	31

Source: Own designed based on [16].

Weekly consumption of eggs per person is for 50% of the people questioned 2-3 times a week, which means that the egg is a favorite food in the family of those investigated.

Also, approx. 21% of people questioned consume eggs at least once a week.

Monthly family consumption of eggs is estimated at up to 10 pcs. in the case of 29% of people, between 11-20 pieces in the case of 33% of those interviewed and between 21-30 pieces for approx. 21% of respondents. Just about 17% of people said that their family consumed more than 30 eggs a month.

Egg purchase preferences show that 42% of people prefer eggs bought from peasants, 29% of people buy from the shop next to the house, while 29% of people buy eggs from the supermarket.

We wanted to find out at what times of day the eggs are consumed. Thus, 75% of respondents said they eat egg especially at breakfast. There is also a weight of 25% of people who serve eggs at lunch, while only 8% of those questioned consume eggs for dinner.

It has been found that only 50% of interviewees know the nutritional value of an egg, being concerned about the composition of the food. The other half of people have admitted that they do not know the details about the chemical composition and nutritional value of the egg.

The main motivation to consume eggs is for 58% of respondents the rapidity of preparation. More than 50% of people appreciate the eggs as tasty and only 29% see a source of protein of animal origin in egg consumption.

Buyers are pretty well informed about the link between the coded egg and the hen's breeding system (54%). And this result entitles us to say that consumer information actions are needed.

The main issues that determine the purchase of the eggs are: shelf life (50% of respondents), shell cleanliness (33%), producer's name (29%), yolk color (29%), shell color (17%). These results lead us to assert that in the view of buyers, the purchase of the egg is based on their food safety,

reflected in freshness, knowing that the egg, like other animal food, is easily perishable.

Regarding the size of the egg, the preferences of the interviewees are 58% directed towards the middle-sized eggs, while for 33% of the people this egg characteristic is less important. The rest of the respondents prefer large eggs.

Regarding the color of yolk, 62.5% of those surveyed prefer eggs with intense colorful yolks, 29%, eggs with medium coloring yolk. This result of our survey overlaps with the result obtained in a study on sensory perception of product quality in Europe (case study poultry products) conducted in 2005. Thus, between 60 and 61% of Italians, Germans and Spanih preferred eggs with more intense coloring yolk, while this type of egg was preferred by 48% of French and 33% by British. These buyers (2,122 people) prefer eggs whose yolk falls to 14 on the egg color appreciation scale. This study has shown that in the case of eggs their quality is perceived by the sensory characteristics [11].

The preferences of those questioned regarding the country of origin of the eggs show that 71% of those surveyed prefer eggs from hens exploited in Romania, their purchase decision being not significantly influenced by the price of the egg.

According to the surveyed people, the intensity of the color of the yolk is associated with the system in which the hens are exploited (42%), the belief that the egg is healthier (42%), the freshness of the egg (18%).

Interviewed people know how to distinguish between eggs from hens raised in the open air and hens raised on the ground. Thus, 42% of people know that eggs from hens grown in the open air have a different nuance of the shell, and the birds have access to different sources of food. However, approx. 21% of respondents believe that the color of the egg shell is an indicator of freshness.

The main reasons that buyers buy eggs from local producers are: confidence in the producer (29%), references from other customers (25%), belief that eggs are fresh (25%). At the same time, very few people

believe that the price of eggs from hens raised in peasant farms is low.

CONCLUSIONS

Enriched cages are the dominating housing system for laying hens in the EU-28. It is followed by barn system, free range and organics systems. The EU is the main global egg trader, because more than 50 % of all eggs from the international markets are exported or imported by EU member states.

In the next years it is expected that the egg production in the EU will grow faster than the consumption.

Weekly egg consumption of those surveyed is for 50% of people of 2-3 eggs. Families of 83% of respondents consume monthly between 10 and 30 eggs. More than half of those surveyed are accustomed to buying commercial eggs.

Consumers appreciate the quality of eggs in terms of sensory characteristics. Thus, they expect a good quality egg to have a strong, shiny, brightly colored yolk (valued at 14 on DSM Yolk Color Fan).

Sensory characteristics and nutritional value of foods are the factors on the basis of which consumers appreciate the quality of the eggs.

Weekly egg consumption of those surveyed is for 50% of people of 2-3 eggs. Families of 83% of respondents consume monthly between 10 and 30 eggs. More than half of those surveyed are accustomed to buying commercial eggs. 75% of the investigated people consume the egg at breakfast. Only 50% of respondents know the nutritional value of the egg. Buyers are pretty well informed about the link between the coded egg and the hen's breeding system. We believe that action is needed to inform the public about the composition and nutritional value of products of animal origin. The main motivation to consume eggs is for more than half of respondents the rapidity of preparation. Approximate 62.5% of those surveyed prefer eggs with intense colourful yolks. The interviewees associate the intensity of yolk colour with the system in which the birds are exploited.

Those surveyed are accustomed to buying medium-sized eggs. The preferences of those questioned to buy eggs produced in Romania show that the price is less important in making the purchasing decision. Those who buy eggs from local producers trust them and think the eggs are fresh.

The main key factors in the quality of poultry products are: food safety, hygiene and freshness.

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