

RESEARCH CONCERNING THE FRESHNESS OF EGGS AND DETERMINATION OF THEIR OLDNESS THOROUGH MEASURING THEIR DENSITY AS A FOOD SAFETY MEASURE

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Abstract

This paper we consider of great importance in maintaining quality of life and health protection of consumers, because by measuring and comparing the density with the very fresh egg (considered the reference standard) there exists the possibility of appreciating its oldness, by a relatively simple method that uses a saline solution in which eggs will be immersed. During aging, slow dehydration occurs of the egg content, with progressive reduction of its volume and instead of the lost water an equivalent amount of air appears determining increase of the air amount. The air is the main vector for microorganisms that enter into egg and the white and yolk are very good nutritive medium is for development and activity.

Key words: problem of food, technological possibilities, quality indicators.

INTRODUCTION

With aging, the egg slowly dehydrates and instead of the lost water air penetrates that crowds in the air room and increases its volume. For this reason, egg specific gravity (density) decreases gradually.

Held for a long time under the same conditions of temperature and humidity, dehydrating is proportional with storage time. Between egg oldness and its specific gravity there is a direct correlation.

Old whites decrease their composition, their appearance becomes liquefied and they no longer preserve the integrity, transparency disappears, it becomes dull and gains dark shades. The yolk has no well-defined contours, it is diverted to the shell and even glued to it, its recovery is difficult. Flavor of freshness is replaced with the old one.

MATERIAL AND METHOD

To verify the assumptions we have made several experimental tests, the results of which can be assessed as satisfactory.

In this respect there have been prepared five solutions of sodium chloride and their density was measured (conventional solutions were marked A, B, C, D, E), Table 1. The preparation of 1000 ml of each solution there was used doubly distilled water.

Table 1

Solutions of sodium chloride and their density was measured

No.	Sample	NaCl solution (g/1000 ml water)	Density
1	A	110	1,074
2	B	80	1,054
3	C	65	1,044
4	D	47	1,032
5	E	30	1,021

There were chosen 25 clean eggs, of uniform size, very fresh (age 4 days) and were arranged in the casing with the round part up to reinforce of the air room in this area. Throughout the experimental period they were kept in an enclosed space without air currents, atmospheric humidity less than 85% and a temperature of 20 ± 2 ° C

The solutions of the 5 flasks were passed into beakers of 2000 ml.

5 eggs were tested by immersion in each solution in turn and there was followed their behavior.

The tests were made in 10 days, every time with other 5 eggs, thus:

- age 4 days, 5 eggs
- age 14 days, 5 eggs
- age 24 zile, 5 eggs
- age 34 zile, 5 eggs
- age 44 zile, 5 eggs.

The 5 eggs of each test were marked (4; 14; 24; 34; 44) and were also used for other analysis.

RESULTS AND DISCUSSIONS

All 5 eggs having the age of 4 days were immersed completely in each 5 solution in horizontal position, having contact with the bottom of the recipient. This proves that their density is greater than 1,074, representing the minimum density of eggs of first freshness.

The eggs with the age of 14 days were also immersed in all 5 solutions, but in solution A (density 1,074) they did not have horizontal but oblique or vertical position. They had contact with the bottom of the recipient only with the tip of the egg, resulting that their density is between 1,074 - 1,054.

The eggs with the age of 24 days had the following behaviour:

- they rose to the surface of the solutions A and B (floating).
- they immersed completely in solution C, but in oblique or vertical position.

- they immersed completely in solutions D and E, in horizontal position.
In this case their density is between 1,054 - 1,032.
Eggs with the age of 34 days:
 - floated in the solutions A, B, C and D.
 - immersed in solution E but in oblique or vertical position.
Their density is between 1,032 – 1,021
- Eggs with the age of 44 days:
 - floated in all 5 solutions, the density was less than 1,021, and when breaking it was observed that the eggs were in an advanced stage of decay.

CONCLUSIONS

1. The test is expeditious and can be carried out in any conditions. It complements and provides the egg exam and offers more information on the age of eggs, so it can be included in the category of current tests for verification and control.

2. In the specialty literature there are sporadic information on the behavior of old eggs in water or immersing them in a solution of salt, but based on their density we can not appreciate the age of the egg. Nor is known the minimum density of eggs of first freshness, which is a useful physical parameter. The results of our investigations complete the knowledge in this field.

3. During storage there is an exchange of osmotic substance from yolk to egg white, which increases with the age of the egg, influencing the value of the refractive index of the two components. Refractive index of the yolk decreases from basic value in the first freshness of the egg and that of the white increases.

4. The two indicators contribute to the enrichment of verification and control criteria of sanitation for public consumption of eggs.

5. Finally it can be concluded that attack of bacteria to human health (the issue of food) is not limited to alteration or food poisoning, but also to other aspects that have to be known in order to determine appropriate protection measures.

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