

## STORAGE DURATION AND TEMPERATURE IN BROILER CHICKEN – STANDARDS AND OBSERVATIONS

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**Abstract:** *Temperature conditions in broiler chicken should be 0-4°C in refrigerated broiler chicken and, in broiler chicken frozen for more than 4 months, -15°C to -20°C to avoid alterations of physico-chemical and organoleptic features. pH values in carcass broiler chicken varies depending on storage time and on the degree of freshness, ranging between 6.1-6.4 in relatively fresh frozen broiler chicken and 6.4-6.5 in de-frozen broiler chicken, reaching 5.8-6.1 in fresh broiler chicken. Microbiological and physico-chemical features are influenced by storage conditions in both storage units and retail units. Easily hydrolysable nitrogen reached, in all analysed samples, values between 19.53±0.38 and 21.14±0.18 in broiler chicken carcass and 18.88±0.24 in broiler chicken legs.*

**Keywords:** *agricultural products, consumer, decision, purchase*

### INTRODUCTION

Temperature conditions are very important because they influence the storage duration of meat: it influences the physico-chemical and organoleptic features of any type of meat, no matter the mammal or bird species [3,4,9]. For normal storage conditions, we need meat to be stored as follows:

Refrigerated meat should be stored at temperatures ranging between 0°C and 4°C to avoid alteration of physico-chemical and organoleptic features for 2-3 days if the pH is 5.8-6.2. If the value of the pH is higher than 6.4, the meat decays and it must be removed from the marketing network.

Frozen meat has longer storage duration and it need storage temperatures between -15°C and -20°C. If the storage period is longer than 7 months, broiler chicken meat oxidises, starts smelling bad and tasting bad, which makes it improper for consumption.

The rather limited storage period in poultry, in general, and in broiler chicken, in particular, is caused by the high content of lipids, particularly unsaturated fat acids that oxidise rather quickly making the meat improper for consumption (altered features) [1,5,8].

pH values in broiler chicken differ depending on storage duration and on temperature, which determines the freshness of the meat, analysed depending on its features as fresh, relatively fresh, or with physico-chemical and organoleptic features altered [2,6,7]. Thus, fresh meat has pH values reaching 5.8-6.1 if frozen and 6.1-6.4 if de-frozen. If meat has storage duration longer than 7 months, though the storage temperature was proper, it becomes inedible if, after de-freezing, its pH reaches values above 6.7. If we need broiler chicken to be used in the food network even after 5 months of storage and be considered relatively fresh, we need it to have, upon de-freezing, pH values ranging between 6.4 and maximum 6.5.

Broiler chicken meat stored in proper conditions should have pH values, when fresh, ranging between 5.8 and 6.1 that change depending on the storage period in cold tunnels until sent for human consumption.

## MATERIAL AND METHOD

Research was carried out on carcass and pieces of broiler chicken from the market. We analysed the freshness degree of the carcasses, legs, and wings, aiming at identifying possible physico-chemical and organoleptic alterations and, hence, freshness degree, and storage conditions in cold rooms in retail units, and at recommending measures to be taken for proper storage.

## RESULTS AND DISCUSSION

To carry out our analyses, we sampled broiler chicken in 4 retail units. Physico-chemical features of broiler chicken carcasses are shown in Table 1 below.

We can see that, in Unit no. 1, the samples analysed have hydrolysable nitrogen values ranging between  $19.53 \pm 0.38$ , negative sulphured hydrogen and Kreiss reactions, and a pH of  $5.8 \pm 0.14$ ; this makes us draw the conclusion that, from a physico-chemical point of view, this retail unit observes the regulations regarding the proper storage of human foods. The same was noted in the other retail units, except for Unit no. 3, where hydrolysable nitrogen reached the highest value  $21.14 \pm 0.18$ . The highest value of pH was in retail Unit no. 4, i.e.  $6.1 \pm 0.17$ .

Physico-chemical features of broiler chicken legs are shown in Table 2 below.

**Table 1**

**Physico-chemical features of broiler chicken carcasses**

	Hydrolysable easy nitrogen	Reacția H <sub>2</sub> S	Kreiss reaction	pH
Unit no. 1	$19,53 \pm 0,38$	negative	negative	$5,8 \pm 0,14$
Unit no. 2	$19,47 \pm 0,19$	negative	negative	$5,9 \pm 0,22$
Unit no. 3	$21,14 \pm 0,18$	negative	negative	$5,8 \pm 0,45$
Unit no. 4	$19,80 \pm 0,18$	negative	negative	$6,1 \pm 0,17$

**Table 2**

**Physico-chemical features of broiler chicken legs**

	Hydrolysable easy nitrogen	Reacția H <sub>2</sub> S	Kreiss reaction	pH
Unit no. 1	$18,88 \pm 0,24$	negative	negative	$5,8 \pm 0,18$
Unit no. 2	$20,60 \pm 0,16$	negative	negative	$5,9 \pm 0,20$
Unit no. 3	$20,66 \pm 0,23$	negative	negative	$6,1 \pm 0,19$
Unit no. 4	$19,83 \pm 0,19$	negative	negative	$5,8 \pm 0,27$

In broiler chicken legs, the lowest pH was in retail Unit no. 1,  $5.8 \pm 0.18$  and the highest one was  $6.1 \pm 0.19$  in retail Unit no. 3. Easily hydrolysable nitrogen in mg/100 g reached values ranging between  $18.88 \pm 0.24$  and  $20.66 \pm 0.23$ , with the highest value in retail Unit no. 3 and the lowest value in retail Unit no. 1. In all the samples, sulphured hydrogen and Kreiss reactions were negative.

Physico-chemical features of broiler chicken wings are shown in Table 3 below.

**Table 3**

**Physico-chemical features of broiler chicken wings**

	Hydrolysable easy nitrogen	Reacția H <sub>2</sub> S	Kreiss reaction	pH
Unit no. 1	18,56±0,16	negative	negative	5,8±0,27
Unit no. 2	18,88±0,24	negative	negative	5,9±0,16
Unit no. 3	19,20±0,27	negative	negative	6,0±0,18
Unit no. 4	20,12±0,18	negative	negative	6,0±0,20

We can see that Kreiss reaction in broiler chicken wings was negative, as was sulphured hydrogen reaction, while pH reached values ranging between 5.8±0.27 and 6.0±0.20, and easy hydrolysable nitrogen had the lowest value in retail Unit no. 1.

**CONCLUSIONS**

Our study shows that in both broiler chicken carcasses and broiler chicken legs and wings, Kreiss and sulphured hydrogen reactions were negative, which shows that storage conditions in cold rooms in broiler chicken retail units observe sanitary standards. It is clear that higher pH values show that some broiler chicken lots were stored for longer periods of time and meat became relatively fresh but did not alter to the point of turning inedible because of its altered features.

Due to the observance of standards regarding meat storage temperature, broiler chicken meat was stored within normal parameters from the perspective of freshness; the storage standards were observed in all retail units that we studied and that made investments in performing freezing equipments.

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