RESEARCHERS CONCERNING THE DYNAMIC OF THE CONTENT OF NaCI AT THE SEMI-MANUFACTURED POULTRY PRODUCTS

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Abstract

The research method used for obtaining some functional poultry aliments will be made of: identification of sources for raw materials and additional, which can offer the quality of functional aliments for finite poultry products, determination of sensorial, physics and chemistry, micro-biological and nutritive characteristics, making of new technological recipes which should contain nutritive elements with a determinative role in controlling the human metabolism, testing the new products on variable periods of time, at refrigeration, in order to be stored and kept in proper conditions, testing the recipes from a sensorial point of view by comparing with the qualitative standards valid for the presented qualitative characteristics and watching of qualitative losses according to the storage conditions of products stored by freezing, analyze and their interpretation. In order to measure and evaluate the qualitative characteristics of raw materials and of finite products we will develop our own processes of testing in research activity. In this study we are watching also, the influenced of NaCl at the semimanufactured poultry products by freezing, defrosting of products and by cooking it.

Key words: optimal nutrition with poultry meat

The addition of vegetables and fruits, used in the experienced technological recipes have a positive effect, because the horticultural products have a number of 58 mineral salts elements, of which the most important are: K, Na, Ca, Fe, Mg, Al and the metalloids S, P, Cl, Si and B, where the sulfates and phosphates predominate.The anions are included in the constitution of the protein molecules, having a plastic role, while the cations fulfill the same arrangement role, participating to the stability of the colloidal systems, to the forming of the protoplasm and of the cellular membranes, to the maintenance of the osmotic pressure and of the PH from the cellular juice (Radu,S., 2010).

MATERIAL AND METHOD

Salting represents the most frequent form of preservation in which the raw materials or ingredients are subjected to the salting process, in order to prevent the alteration and in order to obtain a bactericidal effect. Along with these phenomena, takes place the partial dehydration of the raw materials from the technological recipes, especially of the meat tissue.

Through the salting, some chemical, enzyme and bacterial processes intervene, processes which modify the texture of the poultry and its organoleptic properties.

The action of the salt on the ready-to-eat food, studied according to the experienced technical recipes, can be explained by: the osmotic dehydration, the extraction of water decreases the vitality of the cells, represent an improper manner of the development of microorganisms (with concentrations of over 17,5%), the formation of a protein saline complex, resistant to the germs. The salt is used alone or with sodium nitrate, to which there are added sugar, vitamin C and condiments.

The salt which was added on the surface of the meat, or injected as brine, is dissolved in the meat juice, which is cleared subsequently, thus forming a thick brine. The process of the salt ingression can be intensified by: brine flow, regeneration of the liquid or hot brining.

The weight loss after the salting of ready-to-eat poultry can be up to 4,6% (in the first 8 days), and the loss of the protean substances can be up to 3,5% (Niac, G., 2004).

Water represents the constituent with high ponderosity for the poultry (73 %), but also for vegetables (65-96 %) and fruits (72-90 %). Water has a great importance regarding the metabolism of the cell and it highly influences the processes of making and preserving (grinding, thermal treatment, salting, defrosting). In the vegetal and animal tissues, water is in free state (water from the vacuolar juice), but it can also be chemically bonded (ionic and macromolecular), physically and chemically bonded or mechanically bonded.

Even though the moisture content of the studied products is high, the relatively low losses

cause the disorder of the metabolic processes, they intensify the degradation of the organic substances, reduce the immunity to microorganisms and decrease the ingression capacity (Ionescu A., Popescu D., 2002).

The recipes proposes for the research are the following: 1. Meat poultry with fruits - Poultry meat 400 g, onion 50 g, orange juice 30 ml, apricot 60 g, raisins 50 g, curry 5 g, oil 20 ml, salt 20 g, pepper 5 g and 2. Meat poultry roles with vegetables – flour 500 g, water 300 ml, salt 3g, eggs 300 g which formed pancakes added minced meat poultry 200 g, peppers 50 g, onion 20 g, brocoly 50 g, cheese 100 g, mushrooms 100 g. 3. Meat poultry with raisins – Poultry meat 500 g, sugar 5 g, starch 10 g, raisins 250 g, flour 10 g, rusk 20 g, savory 5 g, 4. Poultry meat with green beans - poultry meat fine paste 300 g, parmesan 100g, garlic 5 g, savory 5 g, white wine 10 ml, green beans 100g, eggs 100 g, vegetable marrow 300g. Analyzing the elements of recipes into the external factor such as: the cooling conditions we are established that the mineral nutrients especially, have an important increasing (Radu, S., A. Chiran and E. Gindu, 2010).

RESULTS AND DISCUSSIONS

For the technological recipes made for ready-to-eat poultry, there is a lower content of Na+ for the first ready-to-eat product (356,7 mg) and for the second ready-to-eat product (443,5 mg), but a high content of Na+ for the third ready-to-eat product (1185 mg) and for the fourth ready-to-eat product (2075 mg).

The content of Cl for the four poultry products varies as well: product number 1 (252 mg), product number 2 (305 mg), product number 3 (1989 mg) and product number 4 (2649,5 mg).(*fig.1*).

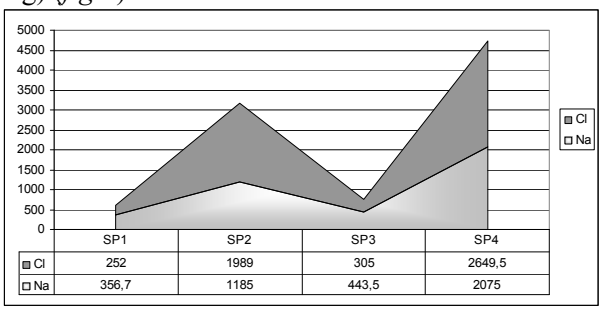

Figure 1 **The dynamic of Na and Cl elements for the semimanufactured poultry products**

The NaCl percentage for the ready-to-eat poultry made after the new technological recipes shows that:

- Product number 3 with 0,625% NaCl is in the last place, though ready-to-eat products have the lowest salt content;
- Product number 2 with 1,863% NaCl is in the last place;
- Product number 1 with 3,243 % NaCl has the highest salt content, which influences the properties of the product regarding its quality;
- Product number 4 with 3,15 % NaCl is in the second place;(*fig.2*).

The moisture loss for the four products varies; the first place belongs to Product number 1 with 16,037 % moisture loss.This is followed by Product number 2 with 3,175% moisture loss and the last one is Product number 4 with 1,934 % moisture loss.(*fig.3*).

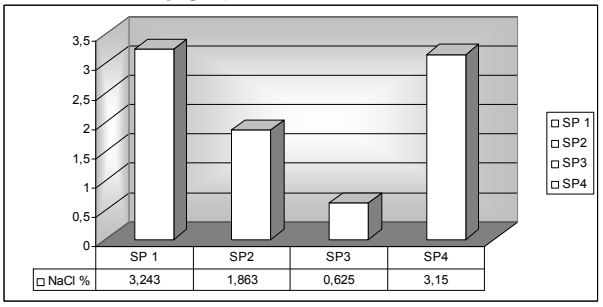

Figure 2 **The content of NaCl % for the poultry products**

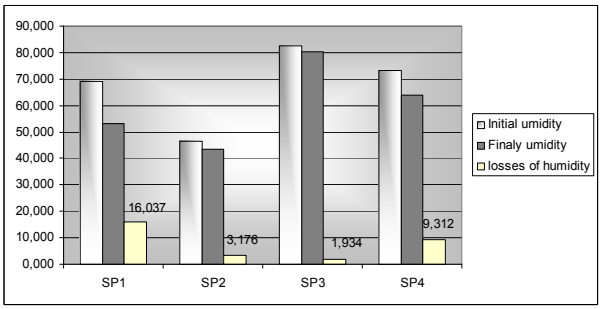

Figure 3 **Losses of humidity after the defrosting of semimanufactured poultry products**

After the comparative analysis of the NaCl% content for each product, with moisture loss calculated after the defrosting, we have the following results:

- the greatest loss resulted for Products number 1 and 4, with the highest content of NaCl%;
- they are followed by Product number 2 with 3,17% moisture and Product number 3 with 1,934% moisture.(*fig.4*).

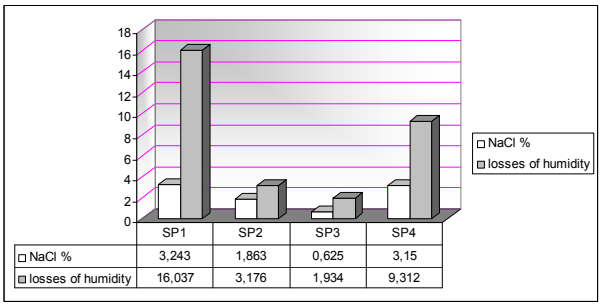

Figure 4 **The dynamic of NaCl % and humidity of the semimanufactured poultry products**

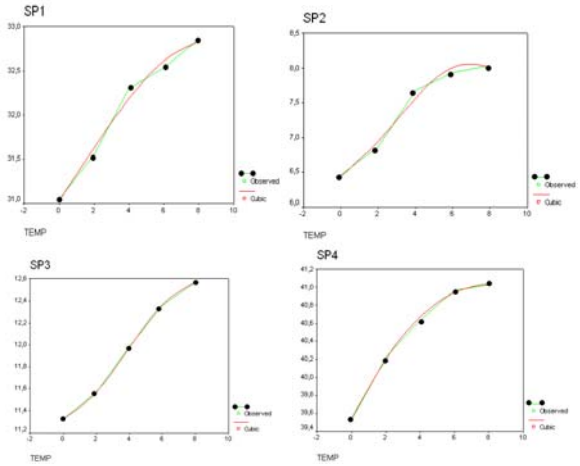

Figure 5 **The dynamic of losses quantity of NaCl at the semi- manufactured poultry products (SP1, SP2, SP3, SP4) between of 0 - 10°C**

Coefficients of regressive cubic function $y = b_0 + b_1 x + b_2 x^2 + b_3 x^3$

(losses - freezing period) Table 1

	r2	Sig f	b0	b1	b2	b3
Poultry meat	1	0,011	3,30	0,25	-0,0016	$\|b_3\| < 10^{-4}$
Sp1	0,998	0,045	8,38	0,55	-0,0022	$\|b_3\| < 10^{-4}$
Sp2	0,999	0,035	3,61	0,05	-0,0002	$\|b_3\| < 10^{-4}$
Sp3	0,985	0,122	3,41	0,30	-0,0024	$\|b_3\| < 10^{-4}$
Sp4	0,999	0,032	6,21	1,03	-0065	$\|b_3\| < 10^{-4}$

The values of the correlation coefficients (losses - temperature) for each semi-manufactured product are situated around the superior value, thus indication a superior correlation between the two series, so the increasing of the temperature at which the refrigeration is made implies a variation of losses following the model described above.

In the study made for determination of losses of mineral nutrients according to the freezing period the statistic model.(*fig.5, tab. 1*).

SP1 and SP4 are the most recommended semi-manufactured products for their introduction into manufacturing and their used until a period of 30 storage days, in order to avoid their qualitative depreciation as a finite product, from an organoleptic point of view.

CONCLUSIONS

After analyzing the experiments, we found out that Product number 2 has a caloric value on an optimum level.

The most equilibrated osmotic product is Product number 2.

Products number 1, 3 and 4 have suffered structural modifications after defrosting, because of the formation of ice crystals while freezing and because the Na+ content was high, which generated a quality below average of these products.

On low salt concentrations, the microbial cell partially dehydrates and it increases its resistance to the applied thermal treatments.

On higher salt concentrations, the microorganisms are affected by the modification of the osmotic pressure, coagulation of proteins takes place and their resistance to the applied temperatures decreases, in the case of thermal treatments.

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