

The dynamic of level nutrients in freezing of chicken semi-products at - 20°C

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Abstract

This paper presents the variation of mineral nutrients in semi-manufactured poultry products during freezing different period of times. The loss of mineral nutrients has a cubic variation with a parabolic one in the studied interval (7-90 days).

Keywords: poultry semi-products, mineral nutrients, freezing

1. Introduction

At present, the action mentioned in EC documents for promoting the quality are considered priorities able to offer visibility and equilibrium. The permanent changing and the necessity to assure the management of this changing based on a continuous improvement, generates the need that industry and public authority should make continuously adequate researches in the field of quality management methods, with the aim to gain and maintain the competitive advantage. Through innovation and design, one can assure the competence of an alimentary product, both of them must be taken into consideration in elaboration of politics in the field of quality and for which is necessary the development of the collaboration relations between University of Agricultural Sciences and Veterinary Medicine from Iasi and production unities with the aim to create the synergy and of some communication real channels among activities, whose results depend one of another.

So that, it will be possible the solving of one major problem, the rapid transfer of the results obtained as a consequence of the scientific research towards production current activities.

Argument. 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, [1] 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 and frozen temperatures, 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 [2,3].

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.

2. Materials and methods

As a consequence, the present research, as its aim to find out a method in order to experiment alimentary products obtained from poultry meat which may become functional aliments, and reduce the risk of appearance of some affections, those aliments having a certain direction, such as: optimization of metabolism by controlling the obesity and diabetes, promoting of defending the organism against oxidative stress, promoting of healthy cardio-vascular system, on gastro-intestinal tract and of mental performance. Inside to the standardization stage of agro-alimentary products, respectively, of the semi-manufactured poultry products, it will be established the parameters of the product and production parameters, in order to achieve an efficient qualitative control of the developed activity. A modern approach of the production process asks for development of specifications inside the company, which leads in fact, at personalization of poultry products that are to be obtained, generates their quality and assures the success of the finite products.

3. Results and Discussion

Increasing of freezing time inducts in the case of each semi-manufactured poultry products losses of mineral nutrients. And in this case, it is to be noticed that the amplitude of losses (variation) is higher when the period of freezing is situated around the interval of time of 7-14 days. In this way, even if, at the value level losses are higher around the period of freezing time of 90 days, at this level, the amplitude of losses (variation) is lower. These aspects indicate a linear correlation with lack of intensity between the series of experimental data (freezing period – losses of mineral salts). In this direction, the cubic function was used:

$$y = b_0 + b_1x + b_2x^2 + b_3x^3$$

which, for the field of studied definition, (7-90 days), follows closely the studied phenomenon.

The increasing of the content in mineral substances in case of poultry manufactured products comparing with the witness sample taking into consideration the new technological recipes took place with 54,14% at SP1 and 56,66% at SP4. At SP2 and SP3 it was notices and decrease of the content in mineral substances with 37,68%, respectively 4%. In case of poultry meat frozen at -20°C the minimal loss registered represents 1,12% (after 7 days), 1,48% (after 14 days), 2,14% (after 30 days), reaching to 3,00% (after 90 days).

Table 1. Losses of mineral nutrients in freezing of chicken semi-products at - 20°C

Mineral nutrients/ losses of mineral nutrients in freezing	Poultry meat, mg	Semi-prep 1, mg	Semi-prep 2, mg	Semi-prep 3, mg
Mineral nutrients	445	970,41	323,2	427,69
Losses of m.n. after 7 day	4,984	11,64	3,93	5,13
Losses of m.n. after 14 day	6,63	16,49	4,36	7,65
Losses of m.n. after 30 day	9,523	22,71	4,97	10,17
Losses of m.n. after 90 day	13,35	40,66	6,72	11,12

Table 2. The dynamic of losses quantity of mineral nutrients at the semi- manufactured poultry product

	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	-0,0065	$ b_3 < 10^{-4}$

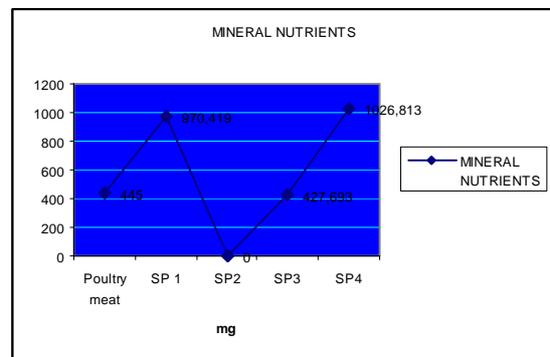


Figure 1. Losses of mineral nutrients in freezing of chicken semi-products at - 20°C

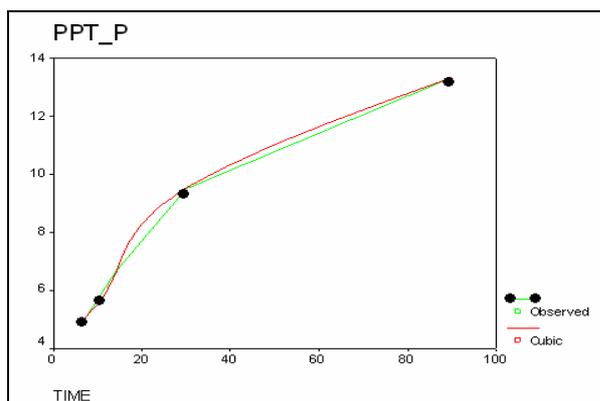


Figure 2. The dynamic of losses quantity of mineral nutrients at the semi-manufactured poultry product (SP1) in freezing after 7 day

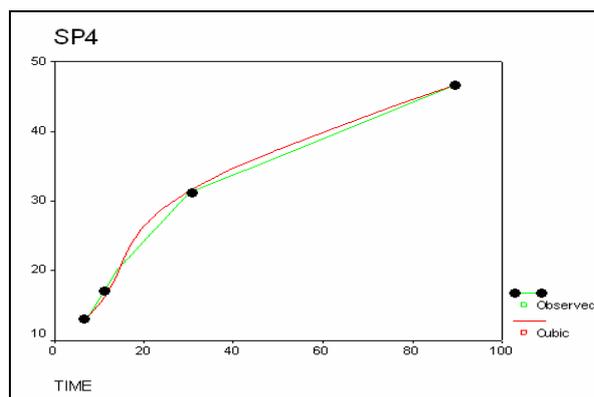


Figure 5. The dynamic of losses quantity of mineral nutrients at the semi-manufactured poultry product (SP1) in freezing after 90 day

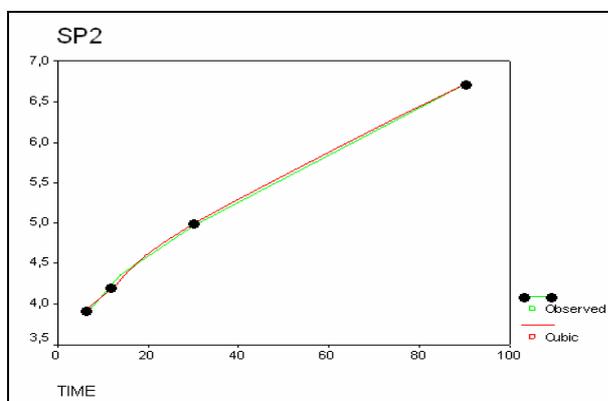


Figure 3. The dynamic of losses quantity of mineral nutrients at the semi-manufactured poultry product (SP1) in freezing after 14 day

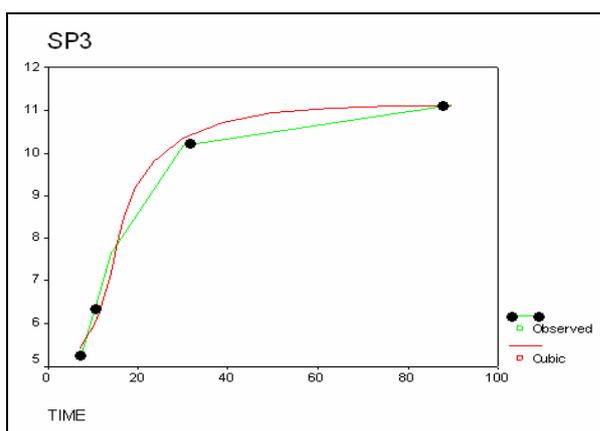


Figure 4. The dynamic of losses quantity of mineral nutrients at the semi-manufactured poultry product (SP3) in freezing after 30 day

In case of semi-manufactured product no. 1 the registered losses was of 1,23% (after 7 days), 1,69% (after 14 days), 2,34% (after 30 days) and 4,19% (after 90 days). In case of semi-manufactured product no. 2 the registered losses was of 1,21% (after 7 days), 1,35% (after 14 days), 1,54% (after 30 days) and 2,08% (after 90 days).

In case of semi-manufactured product no. 3 the registered losses was of 1,19% (after 7 days), 1,79% (after 14 days), 2,38% (after 30 days) and 2,6% (after 90 days).

In case of semi-manufactured product no. 4 the registered losses was of 1,24% (after 7 days), 1,96% (after 14 days), 3,05% (after 30 days) and 4,56% (after 90 days). The biggest losses in case of all the analyzed types were registered after 90 days from freezing, they varying between 2,08% and 4,56%, overrunning also the losses results from freezing the poultry meat.

SP4 registered the biggest loss, but also the content in mineral substances is higher than in the case of witness sample, followed by SP1 with 4,19%. SP2 and SP3 have a decreased content in mineral substances comparing with witness sample, meaning the poultry meat, but the recipe may also be used successfully for the higher content in vitamins of the obtained semi-manufactured products.

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.

4. Conclusion

- The values of the correlation coefficients (losses - temperature) for each semi-manufactured product are situated around the superior value, thus indicating 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 a statistic model was obtained.
- For each case in particular it was calculated also the risk limit (*sig. f*) which has generally lower values, indicating so a higher level of trust in the obtained results.

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