

15. Influence of strong pulsed electric fields on vitamins in milk

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Introduction. In recent years, in order to provide the necessary bacteriological purity in the dairy products technology, increasingly rigorous modes of pasteurization with high temperature (95 ... 97°C) are increasingly used, which not only increase energy costs, but also significantly affect the components of milk (especially proteins, vitamins, calcium).

The promising direction of preserving the vitamin C content in milk is the application of electro-physical methods, namely strong impulse electric fields (IEP) without discharges.

The following areas of research are devoted to the numerical work of Professor Boyko MI. In the given works [1], the description of IEP-technology (or CHIA-technology, where the CHIA is a complex of high-voltage impulse actions), experimental installations and cameras of various types for the implementation of this technology is presented.

Research materials and methods. The purpose of the study is to study the effects of strong pulsed electric fields on the vitamin C content in processed milk [1, 2].

One of the most important vitamins of the antioxidant milk system is vitamin C (ascorbic acid). Ascorbic acid is an active participant in many processes occurring in the human body.

It increases resistance to infectious diseases, increases efficiency, positively affects hematogenesis and metabolism of carbohydrates and cholesterol. However, at high processing temperatures, it easily oxidizes and loses its properties.

Results of the research Results on the change in the vitamin C content in IEP-processed milk is presented in Table 1.

Table 1

Processing time, s	Control, mln/100g	Processing mode	
		U = 15 kV/cm	U = 30 kV/cm
10	1,80	0,90	0,79
15		0,81	0,63
20		0,60	0,49
25		0,58	0,42
30		0,42	0,34

From the achieved results, there is a decrease in the vitamin C percentage. The greatest decrease is observed in the treatment of 30kV / cm for 30s (0.34ml / 100g). The smallest effect of vitamin C has been at 15kV / cm for 10s (0.90m / 100g).

Conclusion. The possibility of heat treatment of whole milk has been proved due to non-thermal effects arising from the impulse action of electric fields.

Bibliography

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2. Svyatnenko R. et al. Impact of pulsed electromagnetic field on escherichia coli vitality in model solution of milk serum //Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. – 2017. – T. 19. – №. 75. – C. 157-160.