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Section 1

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Determination of presence of the water-retainer sodium triphosphate in minced meat with method of near-IR spectroscopy

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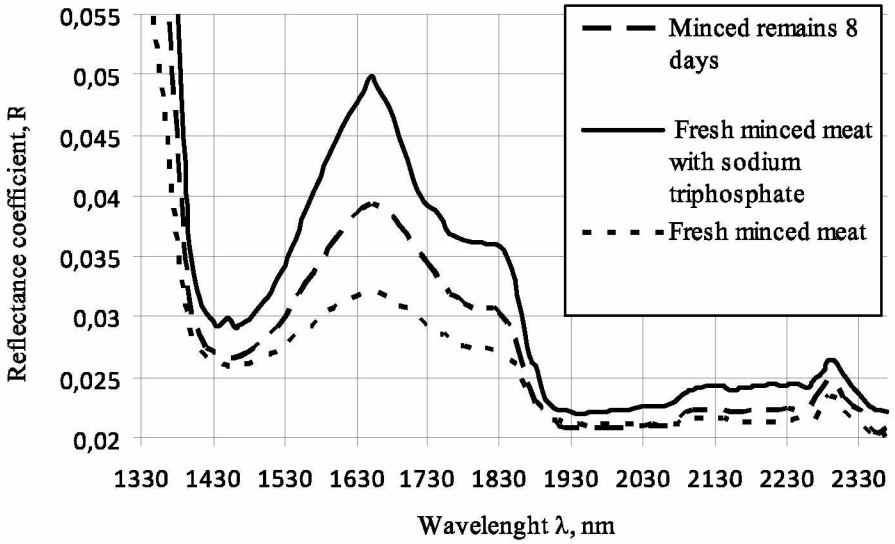
Introduction. Addition of sodium triphosphate (E451) to meat semi-finished products improves the moisture-absorbing properties of muscle tissue, but worsens the absorption of calcium by human body. Therefore, content of sodium triphosphate must be controled.

Materials and methods: test samples of minced meat made of muscle tissue of domestic pig, sodium triphosphate, a method of near-IR spectroscopy, methods for processing and analyzing of spectra.

Results and discussion. Samples of minced meat without additives and with addition of sodium triphosphate in an amount of 0.04% were researched with method of near-IR spectroscopy in the wave range of 1330-2370 nm. All studied samples were prepared of the same portion of minced meat and characterized by the same degree of grinding. IR spectra of all samples were recorded under the same conditions and nearly at the same time (in intervals of no more than 10 minutes). Analysis of the IR spectra of studied samples showed significant increase of the reflectance coefficient of the mixture containing sodium triphosphate in comparison with the minced meat without additives in the spectral range 1560-1670 nm. This region of IR spectra is responsible for the content of bound moisture in the product. The time for recording of one spectrum was less than 2 minutes.



The most considerable growth of the reflectance coefficient is observed at the wavelength of 1630 nm. Obtained values of the reflectance coefficient in this region of IR spectrum considerably exceed values obtained as results of studying of aging process of meat.

Conclusion. This express method of non-destructive IR spectroscopy, provided that the spectrograph has been pre-calibrated, allows to detect objectively the presence of sodium triphosphate (E451) in minced meat. Upgrading and spreading this method detecting of other water-retainers in meat products are promising.