

4<sup>th</sup> International Conference and Exhibition on

# Food Processing & Technology

August 10-12, 2015 London, UK

## Highly sensitive and selective detection of ractopamine in meat via the piezoelectric immunosensor modified by carbon nanotubes

Sergey A Eremin<sup>2</sup>, Nadezhda A Karaseva<sup>1</sup> and Tatyana N Ermolaeva<sup>1</sup>

<sup>1</sup>Lipetsk State Technical University, Russia

<sup>2</sup>Moscow State University, Russia

The highly sensitive gravimetric piezoelectric immunosensor was developed for selective determination of the residual concentration of ractopamine in meat. The application of ractopamine in cattle breeding as a growth-promoting factor and a fat-burning means for obtaining lean meat is banned in EU countries and Russia due to the negative effect of the residual concentrations of the preparation on human health. However, ractopamine is permitted in a number of countries exporting meat and processed meats hence, the development of sensors allows to detect even a low concentration of ractopamine is very perspective. The conditions of forming the recognition layer of the piezoelectric sensor including the obtaining of the substrate on the basis of 2-mercaptoethylamine were investigated. The modification of the substrate by previously activated multi-walled carbon nanotubes leads to a significant increase of the specific surface of the sensor's electrode. The immobilization of ractopamine-BSA conjugates was carried out on the prepared surface with the application of glutardialdehyde. The detection of ractopamine was performed in the competitive format of analysis. Ractopamine's detection via the piezoelectric sensor was validated. The LOD is 0.05 ng mL<sup>-1</sup>, the linear range of the concentration is 0.02-0.1 ng mL<sup>-1</sup>.

### Biography

Sergei A Eremin is Head of Research Group of Immunoassays. He received his BSc in Chemistry on 1976 at the Faculty of Chemistry, MSU. He was awarded a PhD degree in organic chemistry on 1982. He is a member of International Association of Environmental Analytical Chemistry and all Russia D.I.Mendeleev Chemical Society; Editorial Board Member of *Russian Journal of Analytical Chemistry*, *Food and Agricultural Immunology*, and *International Journal of Food Science & Technology*.

[karaseva\\_nadia@mail.ru](mailto:karaseva_nadia@mail.ru)  
[ermolaeva@stu.lipetsk.ru](mailto:ermolaeva@stu.lipetsk.ru)  
[saeremin@gmail.com](mailto:saeremin@gmail.com)

Notes: