Tensiometry method for monitoring of animal fluids

Sergei Yu Zaitsev
Federal Research Center for Animal Husbandry, Russia

The measurement of the surface tension (ST) parameters of the major animal fluids (blood, urea, milk, etc.) is one of the promising methods for monitoring of animal's physiological-biochemical status (APBS). Our group is working over 20 years on APBS fundamental and applied aspects.

The aim of this work was to obtained equilibrium surface tension (eST) and extrapolated tilt angle (eTA) of the blood serum of hybrid pigs using PAT-device ("Sinterface Technologies", Germany). The PAT-device is using "hanging drop" method.

The average eST and eTA data of the blood serum at initial (final) point of hybrid pig's fattening were the following: mean 44.04±0.16 (43.58±0.23) mN/m and 13.16±1.16 (14.40±1.46) $mN \bullet m^{-1} \bullet s^{-½}$; Standard deviations (SD) 0.88 (0.84) mN/m and 6.33 (5.28) $mN \bullet m^{-1} \bullet s^{-½}$, respectively. The SD values had the following meaning: the low standard deviation in the case of eST indicated that the values tend to be close to the average eST data ("expected values") of the set, While a high standard deviation in the case of eTA indicated that these values are spreading out over a wider range.

It is important to highlight that moderate correlations were found between the eST (eTA) parameters and the studied biochemical parameters: total amount of proteins, albumins, globulins, The ratio of albumins to globulins, Total phospholipids, Activity of aspartate aminotransferase, Activity of alanine aminotransferase, De Ritis coefficient, Total cations and Total anions.

The authors recommended to use the eST and eTA data in the range of 42-46 mN/m and 10-30 $mN \bullet m^{-1} \bullet s^{-½}$, Respectively, As reference for the blood serum evaluation APBS at initial (final) point of hybrid pig's fattening.

Biography

Sergei Yu Zaitsev graduated 1980 from the Iomonosov Moscow State University and worked 1980-1999 at research positions in the Shemyakin–Ovchinnikov Institute of Bioorganic chemistry. In 1991–1993 Zaitsev worked in several USA and German Universities. 1999-2019 Zaitsev worked as the biochemistry department head. Since 01.09.2019 Zaitsev works as the analytical biochemistry head. Zaitsev authored over 400 publications, including 15 monographs, handbooks, study guides; more than 200 articles; 11 patents. Zaitsev supervised 2 D.Sc., 17 Ph.D, about 100 magister and bachelor works. Zaitsev is member of the expert's board of the Russian ministry of science and education and in various Russian science foundations in a number of physical-chemical methods and biomedical issues.

s.y.zaitsev@mail.ru