APPROACH TO THE MEASUREMENT UNCERTAINTY EVALUATION OF THE MASS CONCENTRATION PHOSHORUS – CONTAINING SUBSTANCES IN THE SUNFLOWER OIL

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In 2022 year Ukraine managed to keep the world leader position by production of the sunflower. More than 50% of the world export of the sunflower oil is supplied by Ukraine.

The main requirements to the sunflower oil and the sunflower seeds are the requirements to the parameters of the quality and the safety [1-4].

In the chemical testing laboratory of the Ukrainian Scientific Research Institute of Oils and Fats of the National Academy of Agricultural Sciences of Ukraine the researches of the mass concentration of phosphorus-containing substances in the sunflower oil (parameter of the safety) were performed, using the weight method [2].

According to the requirements of [5], testing and calibration laboratories must fulfil the evaluation measurement uncertainty by the each type of measurements.

Testing laboratory obtained only the value of measurand as the average value of the two parallel measurements. The evaluation measurement uncertainty of the mass concentration of phosphorus-containing substances wasn't done. Therefore, the proposition the approach to the measurement uncertainty evaluation of the mass concentration of phosphorus-containing substances in the sunflower oil is the purpose of this paper. To evaluate the measurement uncertainty of the mass concentration of phosphorus-containing substances it's necessary to form the measurement model.

Taking into account presented in [2] formula for calculation the mass concentration of phosphorus-containing substances, the measurement model will contain three input values: physical quantity «mass» and one output value.

So, to obtain the expanded measurement uncertainty of the mass concentration of phosphorus-containing substances in the sunflower oil it's necessary to calculate the type B standard measurement uncertainty of the input values and the type A standard measurement uncertainty of the output value, using information from the electronic weigh's calibration certificate and given in [2] data about the limit value of the relative measurement error.

References:

1. DSTU 4492: 2005 Sunflower oil. Technical conditions.

2. DSTU 7082: 2009 Oils. Methods for determination of mass concentration phosphorated content.

3. DSTU 4350: 2004 Oils. Methods for determining the acid number (ISO 660: 1996, NEQ).

4. DSTU 4811: 2007. Seeds of the oil-contained cultures. Methods of the determination of the humidity.

5. DSTU EN ISO/IEC 17025:2019 National Standard of Ukraine. General requirements for the competence of testing and calibration laboratories.