## 6. Use of reflection spectra in the near infrared region for oil and fat analysis of products

## Inna Hutsalo, Svitlana Litvynchuk, Jana Okopna National University of Food Technologies

Accession. Flakes - a by-product of vegetable oil that is obtained after pressing and extraction of oilseeds. . Schroth indispensable as high protein additives in the production of fodder for large cattle, pigs, birds, because it contains natural proteins, fiber, vitamins E and C, potassium, phosphorus and other minerals.

**Materials and methods.** The main indicators of quality cakes are moisture, crude fat and crude protein. Therefore, based on the analysis of current and future methods for experimental investigation of these indicators was elected unique physical method diffuse reflectivity spectroscopy in the near infrared spectrum. This method is integrated, efficient and very informative. It allows the simultaneous determination of different indicators in raw materials with multi-component chemical composition.

In order to determine the quality of the components in the meal, first moisture content, compare their reflection spectra (listed in optical density) with the absorption spectrum of water. From the published data we know that the infrared spectrum of water has a number of characteristic absorption bands, the intensity of which can be measured moisture content of the sample. The main absorption band of water that meets the basic oscillation molecules account for spectral 6 microns.

The weak absorption in the near infrared region and using diffuse reflectance of the sample being analyzed, permitting direct analysis of the product without the use of chemicals, which sometimes are quite expensive and scarce. This analysis excludes the proposed complex sample preparation and allows measurements over a wide concentration range. The aim of our work was to study the spectra of the diffuse reflection oilseed meal (for example, the most common types of them: sunflower, soybean and rapeseed) in the near infrared region. Experiments conducted on IR analyzer "Infrapid-61" in the wavelength range  $\lambda = 1,33-2,37$  m.

In order to determine the quality of the components in the meal, first moisture content, compare their reflection spectra (listed in optical density) with the absorption spectrum of water. From the published data we know that the infrared spectrum of water has a number of characteristic absorption bands, the intensity of which can be measured moisture content of the sample. The main absorption band of water that meets the basic oscillation molecules account for spectral 6 microns. A study in the absorption spectrum involved combinations of OH vibrations (at  $\lambda = 1,93$  m) and valence fluctuations (first overtone) (with  $\lambda = 1,45$  m). It is for these vibration transitions can analyze moisture content in the samples.

**Results.** NIR analyzer makes it possible to automatically calculate the first and second derivative reflectance spectra. Comparison charts showed that more extremes there is depending on the graph of the second derivative of reflection coefficient, that is, through this analysis can be experimentally determine the effect of vibration spectra of other chemical bonds to the formation of the main analytical strips for further quantitative spectral analysis. Published data also justify the use of derivatives is paired to analyze a variety of foods.

**Conclusions.** Thus, the study features reflectance spectra enables more widely implemented method of infrared spectroscopy for rapid analysis determination of fat, protein, moisture and other elements in food processing oilseeds (either during storage, sorting and processing technology).