***Introduction:*** This study is carried out to determine the degree of oxygen saturation of multilayer biological objects on the example of breast tissues by recording and analyzing backscattering spectra. Measuring the saturation of tissues undergoing surgical intervention provides information that can be used to select further actions in the treatment of the patient. It can be a quantitative indicator of quality when stitching any structures together. Also, the measurement of breast tissue saturation can serve as a control method in the postoperative period.

***Purpose:*** The aim of the study is to select measurement parameters to determine the degree of oxygen saturation of biological tissues and to assess the level of oxygen saturation of hemoglobin on the example of breast tissues in clinical conditions.

***Materials and methods:*** In the course of work, there have been conducted several experiments with optical phantoms simulating breast tissue, which were made on the basis of hemoglobin, fat emulsion, pig skin to determine the sensitivity of the developed technique using a spectrometric measuring equipment.

***Results:*** During the experiments, the optimal parameters for the saturation assessment were determined. The characteristic depth of tissue probing was also defined at the determined optimal distance between the receiving and emitting fibers. Also, the method of measuring tissue saturation considered in this study was used in measuring mammary glands in patients with breast cancer. The estimation of the saturation after surgery can be used to assess the blood supply in the postoperative period and determine the state of the investigated tissue.