INFLUENCE OF TECHNOLOGY OF RAINBOW TROUT
(ONCORHYNCHUS MYKISS WALBAUM, 1792) BREEDING
ON INNATE IMMUNITY AND PATHOMORPHOLOGICAL
PATTERN OF THE LIVER

INTRODUCTION
Rainbow trout breeding activities in Poland are underway to develop a competitive, modern and dynamic sector of aquaculture and processing of its produce. The aquaculture production output is expected to grow by 50% by 2013 relative to 2006. Expectations of the contemporary consumer are clearly oriented towards slow food, which includes low-processed, traditional and organic food. Moreover, the Commission (EC) Regulation No. 710/2009 requires the evaluation of the effect of water recirculation on the trout organism.

MATERIAL AND METHODS
The study was conducted on 480 trout divided into 6 groups (n=80): A-C, fish from extensive production (open breeding facilities - OBF), D-F, fish bred in environment with a high degree of recirculation (closed water systems - CWS). Each group (A-F) contained trout with a body mass of 350-500 g (A1-F1) and 501-800 g (A2-F2). The trout were taken for the study in autumn 2010 and spring 2011. The immunological study of the cellular immunity in the rainbow trout was carried out by determination of metabolic (RBA) and cidal (PKA) activity of phagocytes and activity of T and B lymphocytes. Humoral immunity was specified by means of determination of the activity of lysozyme (LSM) and ceruloplasmine (Cp) as well as total protein (TP) and the gamma-globulin fraction (Ig) in the rainbow trout serum. Macroscopic, microscopic and ultrastructural assessment was conducted. Sections of liver were fixed in 5% neutralised formalin, stained with haematoxylin and eosin and according to the PAS method by McManus. Samples of the liver for ultrastructural examination were taken from 8 trout from each group.

RESULTS
The results have shown that the RBA and PKA phagocyte activity and LyT and LyB, as well as LSM and Cp activity and the level of TP and Ig during the analysed periods of the breeding season, both in autumn and spring, were typical of the fish species and the study period. In individual cases of trout from A-F and A1-F1 groups, macroscopic examination revealed congestion of hepatopancreas, steatosis or enlargement of the spleen. The microscopic examination of trout in groups A-C showed slight regressive lesions, especially parenchymatous degeneration and perturbationes circulatorie. Other changes were observed sporadically. Ultrastructural examination also quite frequently revealed steatosis simplex. Mitochondrial oedematous, defragmentation of RER and glycogen distribution disorders occurred rarely. Similar, but slightly more intensive changes were observed in fish in groups D-F and occasional lymphoid cell infiltrations. Small changes in mitochondria were usually observed under an electron microscope. Steatosis simplex was observed to a lesser extent.

A-C: Fig. 1-3, 7, 8; D-F: Fig. 4-6, 9, 10.

CONCLUSION
Rainbow trout bred in OBF and in farms with CWS showed similar cellular and humoral immunity. Considering the intensity of the morphological lesions the assessed technologies of rainbow trout breeding influenced similarly the pattern of rainbow trout liver.