The aim of the study was to determine the probiotic potential of environmental *Carnobacterium maltaromaticum* bacteria and to investigate the possibility of using this strain in the form of an additive to fodder used in aquaculture of fish with different temperature requirements, as a method influencing the welfare increase of selected fish species and efficiency their experimental rearing in closed water circuits (RAS).

The first stage of the research involved the selection and definition of the probiotic properties of the environmental *C. maltaromaticum* strain based on microbiological tests regarding the physiological requirements of the isolate (optimal growth temperature, oxygen demand), biochemical properties and metabolic activity in relation to 96 different carbon sources. The survival of the environmental *C. maltaromaticum* isolate under stressful conditions was assessed, including: breeding environments diversified in terms of the nutrients content, pH values (5-9 pH) and salinity (2-20% NaCl), resistance to antibiotics commonly used in human and fish therapy, and antagonist effect on fish pathogenic bacteria (*Pseudomonas fluorescens, Aeromonas hydrophila, Yersinia ruckeri*). The influence of the *C. maltaromaticum* isolate on the number of saprophytic and potentially pathogenic microbiota (TVC 28 °C, Hem 37 °C, *Staphylococcus sp., P. fluorescens, A. hydrophila, Clostridium sp*., TBP, yeast and mould fungi) present in water, feed, skin and digestive tract content of fish was determined.

The second stage consisted in carrying out experimental rearing of rainbow trout (*Oncorhynchus mykiss*) and African catfish (*Clarias gariepinus*) fry in closed water circuits (RAS). Each species of fish (n = 180) was divided into two groups (control and research), and from each group, 3 representative fish stocks (n = 30) were selected and reared in separate RAS pools. During the experiment (8 weeks), the fish were fed with feed in the amount of 1.3% (rainbow trout) and 3% (African catfish) of the fish biomass. The fish in the control groups were fed with commercial feeds Aller Gold (rainbow trout) and Aller Bronze (African catfish), while in the research groups they were fed with appropriate feeds with 0.1% addition *C. maltaromaticum*. During the experiments, microbiological tests of water, fish (skin, digestive tract content) and feed were carried out, breeding indices, feed nutrient digestibility factors and intestinal histology were analyzed.

The obtained results showed that *C. maltaromaticum* bacteria performed the conditions of the probiotics definition (FAO/WHO Working Group Report 2002) and could be used in fry feeding, because no adverse effects on the health of both fish species were found. A positive impact of the tested strain on the quantitative and qualitative composition of the microbiota: the RAS aquatic environment, the feeds used (Aller Gold, Aller Bronze) as well as the skin and the contents of the digestive tracts of the experimentally reared fry of rainbow trout and African

catfish was noted. The effects of feeding both fry species with feed supplemented by the environmental probiotic *C. maltaromaticum* isolate were favorable changes in breeding indicators in the tested fish (FCR and SGR), improved digestibility of feed nutrients, including: crude protein, nitrogen-free extracts (NFE) and crude ash, and increased surface area absorbent intestinal villi of rainbow trout and African catfish**.**