Abstract

The water footprint is a multidimensional indicator which was created to quantify the total volume of freshwater used for various purposes. With the water footprint it is possible to determine the volume and type of water used directly and indirectly during the production in a given place and time. The data related to the water footprints of products are utilized in the evaluation of the international trade with goods, too (a concept of virtual water used for the analysis of water stress export out of the country which imports water-intensive products). The greatest amount of water is used globally in the agriculture, so the agricultural products are the ones with the highest water footprints. The focus of concern is the water footprint of an agriculture production and the aim of this work is to bring the first results regarding the water footprint of the cow milk in the Czech Republic and also to evaluate a methodology of its calculation. Two dairy farms dealing with a market production of milk from the Liberec region were chosen for the research. The farm Rváčov is oriented to an intensive milk production and on the other hand the farm Bzí is a system with mixed elements of extensive and intensive characters of the dairy production. For the comparison of the milk production effectiveness we have used a method of milk correction according to its energy content, which is in accordance with the standards developed by the Water Footprint Network organization. We have found that over 99 % of the water footprint of each farm consists of so-called "green water", which is the water contained in the feed. The most significant ratio of the "blue water" is the drinking water for the cattle – 67 % in the intensively oriented system and 84 % in the mixed system. It was found that the water footprint of raw milk in the intensively oriented system is 852 m^3/t and 6 m^3/t for the green and the blue water respectively. In the mixed system the relevant values are 595 m^3/t and 3 m^3/t for the green and the blue water respectively. The lower value of the water footprint of the mixed system is probably caused by higher efficiency of milk production. This is probably related to a prolonged lactation period and a breed of the cattle.

Keywords: indicator, water footprint, virtual water, milk production, dairy production system.