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Food consumption patterns and their effect on water requirement in China

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Abstract. It is widely recognized that food consumption patterns significantly impact water requirements. The aim of this paper is to quantify how food consumption patterns influence water requirements in China. The findings show that per capita water requirement for food (CWRF) has increased from 255 m^3 $cap^{-1}y^{-1}$ in 1961 to 860 m^3 cap^{-1} y^{-1} in 2003, largely due to an increase in the consumption of animal products in recent decades. Although steadily increasing, the CWRF of China is still much lower than that of many developed countries. The total water requirement for food (TWRF) has been determined as 1127 km^3 y^{-1} in 2003. Three scenarios are proposed to project future TWRF, representing low, medium, and high levels of modernization (S1, S2, and S3, respectively). Analysis of these three scenarios indicates that TWRF will likely continue to increase in the next three decades. An additional amount of water ranging between 407 and 515 km^3 y^{-1} will be required in 2030 compared to the TWRF in 2003. This will undoubtedly put high pressure on China's already scarce water resources. We conclude that the effect of the food consumption patterns on China's water resources is substantial both in the recent past and in the near future. China will need to strengthen "green water" management and to take advantage of "virtual water" import to meet the additional TWRF.

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