The Heat Melt Compactor (HMC) is designed to sterilize and process wastes produced during space missions. Benefits of the HMC include reduction of biohazards to the crew, reduction in volume of wastes that would otherwise require storage, production of radiation shielding tiles, and recovery of water and other resources. Water reuse is critical onboard spacecrafts; it reduces the need for resupply missions and saves valuable storage space. The main sources of water in HMC batches are food, beverages, shampoo, disinfecting wipes, toothpaste, and diapers. Water reclaimed by the HMC was analyzed for concentrations of Na^+, NH_4^+, K^+, Mg^{2+}, Ca^{2+}, Cl^-, NO_2^-, Br^-, NO_3^-, PO_4^{3-}, SO_4^{2-}, total organic carbon (TOC), total inorganic carbon (TIC), % total solids, and pH. The data are discussed in relation to the current water input characteristics established for the International Space Station Water Processor Assembly system. Batches with higher than average amounts of food produced HMC product water with higher sulfate content, and batches with higher proportions of disinfectant wipes and food yielded HMC product water with higher ammonium concentration. We also compared theoretical chemical composition of HMC product water based on food labels and literature values to experimental results.