

## 29. Update on Water in Food

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**Introduction.** Water is a crucial nutrient and euhydration is necessary for optimal daily functioning. Water balance is precisely regulated within the body and many methods exist for assessing hydration status.

Water is commonly treated by adding chemical disinfectants, such as free chlorine, chloramines, chlorine dioxide, and ozone. However, although very effective in removing disease-causing microorganisms, these disinfectants can react with naturally occurring materials in the water and can form disinfection by-products (DBPs) which can be harmful to human health. This study looks at detection of these by products using mass spectrometer.

Although it is often overlooked as an essential nutrient, water is vital for life as it serves several critical functions. Total body water comprises approximately 45–75% of a person's body weight. Muscle mass is 70–75% water, while water in fat tissue can vary between 10 and 40%. Water acts as a transporter of nutrients, regulates body temperature, lubricates joints and internal organs, provides structure to cells and tissues, and can help preserve cardiovascular function. Water consumption may also facilitate weight management. Water deficits can impact physical performance, and recent research suggests that cognitive performance may also be impacted. This article will address water balance, hydration assessment, and the effect of water balance on cognitive performance.

Water needs can vary from person to person – and no one person will need the same amount of fluid from one day to the next - thus, developing a recommended dietary allowance (RDA) for water is challenging. The Institute of Medicine (IOM) established an Adequate Intake (AI) for water, which is a guideline to help most healthy individuals avoid dehydration. On average, Americans typically consume about one liter (~ 4 cups) of drinking water per day. While the AI addresses water needs of the general public, the health and fitness professional must consider an individual's physical activity regimen and environment when assessing hydration needs. Dehydration can negatively impact physical performance, and the magnitude of decrements in physical performance may be influenced by fitness level, environmental acclimatization, and mode of activity.

The water content of foods is very variable: 10 to 20% in cereals, 60 to 75% in meat and animal flesh, 80 to 90% in fruits and vegetables. Water has three main functions in food. These functions are: 1) *Function solubilization* (or *dispersion*): Water in foods is the solvent of the hydrophilic constituents. 2) *Function structure*: Water plays a key role in the pattern of food macromolecules, including proteins and carbohydrates. The water also determines the structure of certain constituents in the micelle. This applies, for example, casein in milk. 3) *Mobilization function*: water, compared to other fluids, is the mobility factor of the response in food products.

**Conclusions.** Knowledge of the water content of food is necessary for the efficient conduct of the operations of harvesting, drying, storage or processing. It is a key parameter for evaluating and controlling the risks of deterioration during storage of foodstuffs.

### References

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