

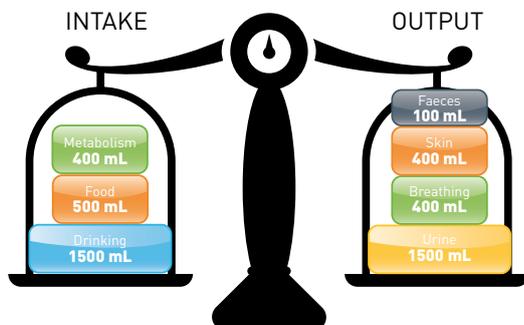
# KEY TIPS ON HYDRATION

## HYDRATION IN WINTER

In cold climates, body fluid losses can be as high as those in hot climates because of high rates of energy expenditure, use of heavy clothing and increased losses in urine<sup>1,2</sup>.

Under normal conditions, urine and sweat are the main methods of water loss, but we also lose water via the lungs and faeces. These losses vary widely depending on fluid intake, diet, activity level, temperature and clothing<sup>2,3</sup>.

### Example of normal water balance



In cold weather conditions, additional water losses occur as a result of **increased urine and respiratory water losses**. Some water is also lost through the skin as a result of heavy clothing and because sweat evaporates quickly in cold, dry air.

## RESPIRATORY LOSSES

Daily respiratory water loss is normally about 250 to 350 mL/day for sedentary people, but can increase to 500-600 mL/day for active people<sup>4</sup>. The actual amount lost is influenced greatly by environmental conditions (air temperature, humidity and wind speed) and the level of physical activity<sup>3</sup>.

**Winter activities such as skiing, snowboarding and ice-skating can therefore greatly increase water loss, as can working or playing outdoors in the winter:**

- ➔ Breathing cold, dry air can increase respiratory water loss by approximately 5 mL/hour<sup>1</sup>, so this effect in itself is generally rather small for short exposures, but becomes meaningful when living in very cold climates and exposed to these conditions for 24 hours per day.
- ➔ Stressful physical exercise in cold weather can increase this loss to approximately 15 to 45 mL/hour<sup>1</sup> because of the increased rate and depth of breathing.

## URINE LOSSES

As the body gets colder, water loss as urine increases due to a higher urination rate, a physiological response known as cold-induced diuresis, which produces urine of low specific gravity\*<sup>2,3</sup>.

\* Specific gravity of urine is a measure of the concentration of solutes excreted.

## PRACTICAL TIPS TO STAY HYDRATED DURING THE WINTER

- Drink plenty of fluids, especially when exercising or working outdoors.
- Drink regularly even when not thirsty as the sensation of thirst is reduced in cold weather, and this can lead to dehydration<sup>5</sup>.
- Meals play an important role in helping to stimulate the thirst response causing the intake of additional fluids and restoration of fluid balance<sup>6</sup>.
- Meals also provide water; it is calculated that of the total water needed:



**20-30%** typically comes from food and about

**70-80%**

from beverages (all types, not just plain water)<sup>2,7</sup>

However, this may vary greatly depending of the diet that an individual chooses.<sup>2,7</sup>

- Avoid excessive amounts of heavy clothing as it can cause significant sweating and water and mineral salt loss.
- Although urine colour is generally a useful index of hydration status\*, this may not be true in the cold when the cold stress may lead to an increased rate of production of diluted urine.
- The skin should also be cared for, as cold, dry air outdoors and indoor heating contribute to the removal of water from the skin, causing dry, cracked skin<sup>9</sup>.

\* See our educational material about how to measure hydration status at:  
[www.europeanhydrationinstitute.org/educational\\_materials.html](http://www.europeanhydrationinstitute.org/educational_materials.html)

**1.** Freund BJ, Young AJ. 1996. In: Buskirk ER, Puhl SM, eds. Body Fluid Balance: Exercise and Sport. Boca Raton, FL: CRC Press. Pp. 159–181. **2.** EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). EFSA Journal 2010; 8(3):1459. Available at: [www.efsa.europa.eu/en/efsajournal/pub/1459.htm](http://www.efsa.europa.eu/en/efsajournal/pub/1459.htm) **3.** Panel on Dietary Reference Intakes for Electrolytes and Water (2005) Dietary reference intakes for water, potassium, sodium, chloride, and sulphate. National Academy Press: Washington DC. **4.** Hoyt RW, Honig A. 1996. In: Buskirk ER, Puhl SM, eds. Body Fluid Balance: Exercise and Sport. Boca Raton, FL: CRC Press. Pp. 183-196. **5.** National Research Council. Nutritional Needs in Cold and High-Altitude Environments: Applications for Military Personnel in Field Operations. Washington, DC: The National Academies Press, 1996. p. 170. **6.** Maughan RJ, Leiper JB, Shirreffs SM. Eur J Appl Physiol Occup Physiol 1996;73(3-4):317-325. **7.** Manz F, Johner SA, Wentz A, et al. Br J Nutr 2012; 107(11):1673-81. **8.** Kolasa KM, Lackey CJ, Grandjean AC. Nutrition Today 2009;44:190-201. **9.** Weber TM, Kausch M, Rippe F, et al. J Clin Aesthet Dermatol. 2012;5(8):29-39.