

Running on Fumes? Why Pilots Need to Fuel with Water Too



As pilots, we log time, track weather, and monitor aircraft systems with precision. But how often do we check our own system performance? Hydration—often overlooked—is one of the simplest, most effective ways to maintain operational readiness and avoid preventable errors on the flight deck.

Water makes up about **60% of total body weight** and over **75% of brain tissue**. It regulates body temperature, cushions joints, carries nutrients and oxygen to cells, and removes waste. Even mild dehydration can disrupt these processes—and you may not notice it until your performance is already compromised.

Aviation Environments Accelerate Fluid Loss

Aircraft cabins are pressurized to altitudes of 6,000–8,000 feet and typically hover at **10–20% humidity**—drier than the Sahara Desert. At cruise, we lose water rapidly through respiration and low humidity alone. Over a three-hour flight, that's **up to 1.5 liters of fluid loss**—without considering other factors like caffeine, dry meals, or workload.

Cognitive and Physical Impacts

Studies show that **just 1–2% dehydration** can reduce cognitive performance by up to **10%** (Journal.of.Applied.Physiology). That means slower reaction time, poor concentration, and

impaired judgment—especially dangerous in high-stakes, high-tempo environments. Dehydration also increases heart rate, reduces endurance, and negatively affects mood and alertness—all key variables in flight safety.

Case Study: Buttonwillow Runway Overrun – The Hidden Impact of Dehydration

On June 13, 2011, an agricultural aircraft sustained substantial damage after overrunning the runway and striking two dumpsters at a private airstrip in Buttonwillow, California. The pilot, who had been flying for nearly eight hours, reported feeling fatigued and dehydrated. Despite making multiple landings earlier in the day with only slightly worn brakes, this landing was flown with a tailwind and at a slightly excessive speed. The pilot could not stop the aircraft in time, leading to the overrun and collision.

The NTSB determined the probable cause to be the pilot's misjudgment of the landing approach, resulting in a long landing and runway overrun. Contributing factors included the pilot's likely fatigue and dehydration—reminders that human performance can be just as critical as mechanical function regarding safe operations.

How Much Is Enough?

According to the Academy of Nutrition and Dietetics, men need about **15.5 cups (3.7 liters)** of total water per day, and women about **11.5 cups (2.7 liters)**. Around **20% comes from food**, so the remaining 9–13 cups should come from beverages. That's about **2 to 3 liters per day**, more if you're in a hot environment, flying long duty days, or working physically on the ramp.

Hydration Best Practices for Flight Crews

-  Drink 16–24 oz of water an hour before duty.
-  Keep a refillable water bottle on the flight deck—sip, don't gulp.
-  Avoid sugary drinks and limit caffeine and alcohol.
-  Use pale urine as a hydration checkpoint.
-  Consider electrolytes on long-haul or hot-weather flights.
-  Include hydration reminders in flight briefs and shift handovers.
-  Encourage crews across all aviation roles—pilot, maintenance, ramp, dispatch—to monitor and manage fluid intake.

-  Reinforce hydration as a frontline defense against early-stage human performance risks.

WYVERN's Human-Centric Approach

At WYVERN, our Flight Leader Program and Safety Culture Assessments recognize that operational safety starts with people—not just procedures. Whether you're on the flight deck, on the ramp, in the hangar, or behind a desk, hydration directly affects focus, judgment, stamina, and resilience.

We encourage all aerospace professionals to treat hydration as part of daily readiness—integrated into flight plans, shift briefs, and personal checklists. Supplying your aircraft is essential—but staying hydrated is a safety habit we can't afford to overlook.

Because the most advanced aircraft is only as sharp as the people who operate, support, and oversee it.

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