



# The science behind saliva hydration testing



## Why Does Hydration Matter?

Optimal hydration is essential to maximize physical and cognitive performance and avoid injury. Under high-temperature or high-intensity conditions sweat rate can exceed 2,000 mL/hour.

When this water loss isn't replaced as little as a 2% decrease in body weight can reduce aerobic performance, muscular endurance and cognitive function and there are increased risks of heat exhaustion and heat stroke.

## What is the Evidence behind Salivary Osmolarity?

Multiple studies, as well as our own research, confirm that SOSM measurements are an effective predictor of hydration status during fluid restricted exercise trials. These studies confirm the ability of SOSM to track both acute and chronic changes in hydration state.

## What does my hydration score mean?

The MX3 salivary osmolarity scores are colour coded and displayed as:

hydrated	≤ 65 mOsm
mildly dehydrated	66 - 100 mOsm
moderately dehydrated	101 - 150 mOsm
severely dehydrated	≥ 151 mOsm

*\*The MX3 hydration score is not to substitute medical advice*

## What is Salivary Osmolarity?

The osmolarity of a liquid is the concentration of dissolved particle per liter of a solution. Salivary osmolarity (SOSM) is the concentration of particles, predominantly electrolytes, per liter of saliva. The MX3 HTS is a simple, low cost and rapid way of conducting laboratory-grade SOSM measurements anywhere at any time.

We've benchmarked our system against multiples medical-grade laboratory osmometers and performed tens of thousands of measurements to ensure our test strips are precise and accurate.

## How does the HTS stack up against urine testing?

We believe that measuring SOSM with the MX3 HTS is the most effective, convenient, and meaningful approach for measuring hydration in athletes. Compared to USG, urine color assessment, and body weight changes, the MX3 HTS offers some clear advantages in terms of convenience, accuracy, and flexibility.

Measurement data is automatically stored and analyzed by the MX3 App, rather than needing to be manually recorded and processed. This allows users to analyze and act on hydration measurements rapidly, and easily perform long-term analysis to identify conditions where greater focus should be placed on hydration.

## Want to know more?

Please contact [support@mx3diagnostics.com](mailto:support@mx3diagnostics.com) for more technical information.

## MX3 vs USG

MX3	USG*
Hydrated	< 1.02
Mildly dehydrated	1.02 - 1.03
Moderately dehydrated	1.03 - 1.04
Severely dehydrated	> 1.04

*\* Values applicable for first morning urine test. Spot urine test may have reduced accuracy due to potential contaminants.*

## MX3 vs other hydration tests

	Convenience	Non-invasiveness	Accuracy
MX3	★★★★★	★★★★★	★★★★★
Bodyweight	★★★	★★★★★	★★★★★
USG (first void)	★	★★	★★
USG (spot)	★★	★★	★
Urine Colour	★★★	★★	★