



# Hydration<sup>®</sup>

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## Hydration and Military Operations

**H**ydration is a major concern for physically active individuals who are exposed to various environmental conditions including, extreme heat and cold temperatures and high altitude. Individuals performing field operations need to stay properly hydrated in order to maintain physical and mental performance. Both, CeraSport and CeraLyte, rice-based oral hydration products can be used in the field to help individuals maintain proper hydration.

### General Maintenance of Proper Hydration During Operations

- ▶ Thirst alone is not a good indicator of adequate fluid intake, so individuals will always need to drink before they feel thirsty.
- ▶ In hot weather, the amount of calories required actually increases slightly

although the desire to eat goes down. Appetite suppression is a more serious problem for people that are not heat acclimatized.

- ▶ The amount of salt lost in sweat varies depending on a person's degree of acclimatization. As the body adjusts, or acclimatizes to the heat, sweat contains less salt. Military rations under most circumstances contain adequate amounts of salt but additional salt may be lightly added to food during the first few days of heat acclimatization.
- ▶ Adults generally need at least 4 to 6 liters of fluid per day at high altitudes because of the extremely dry air. At least 1 liter of fluid must be consumed every 3 hours to meet the suggested requirement.

### Hydration

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Photo courtesy of US Dept of Defense

## CeraSport: What is the Difference?

By Tracy Stalker, MS, NCSF-CPT

**T**he rice-based carbohydrate in CeraSport provides energy, enhances water absorption and creates sustained hydration. CeraSport is different than all the other sports and vitamin drinks. Common sports drinks contain only simple sugars. Flavored vitamin water or low-calorie drinks contain very minimal amounts of sugar or carbohydrate. Calories

are important because they provide energy for the body during physical activity.

During digestion, rice carbohydrate is broken down into glucose molecules. Glucose then acts as a transport mechanism for sodium. Efficient

### Difference

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## Hydration *from page 1*

- ▶ Schedule drinking at hourly intervals.
- ▶ Monitor the color and volume of an individual's urine to check for dehydration. If urine is dark yellow or brown and less than normal amount, the individual is probably dehydrated. Individuals should drink until their urine turns pale yellow in color.

## Hot Environments

The most critical need in hot environments is adequate fluid replacement. The body cools itself through the evaporation of sweat

(which consists of water and salts) when the environment is hot. Heavy work increases sweat rates and the likelihood of dehydration and other heat injuries. Maximum sweat rates can exceed the body's ability to absorb fluids. In hot environments, sweat rates of 1.5 liters per hour or more are not unusual and are higher when individuals wear chemical protective clothing. Failure to adjust work-rest cycles to control the buildup of body heat and failure to replace fluid lost through sweating can lead to dehydration. This, in turn, increases an individual's susceptibility to heat injury and/or illness.

## Cold Environments

Individuals often become

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*CeraLyte and CeraSport are some of the few products I've used in the high heat stress environments that actually works to combat heat injury. Using your product last summer in temps over 126°F and with full body armor, I was able to function without any complications. I highly recommend your product to anyone operating under these conditions. DH*

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dehydrated during cold weather operations. Problems with frozen water and eating field rations contribute to reduced fluid intake in cold weather operations. People who are dehydrated "feel the cold" more keenly than well hydrated individuals. Dehydration can reduce appetite, impair the shivering response, and lead to low energy levels and lethargy. Lethargy is not a desirable physical state in the cold since physical activity is necessary to generate heat. In addition, calorie requirements of individuals can be 25-50% higher during cold-weather operations than in warm or hot weather.

## High-altitude Environment

It is easy to become dehydrated in high-altitude environments. Dehydration increases the risk of cold injury and exacerbates the fatigue, impaired judgments and apathy of hypoxia. The body's requirement for fluids is very high at altitude; often exceeding 4 liters of water per day. This is mainly caused by increased water losses from the lungs due to the increased ventilation of

cold, dry air. There is also increased urinary loss of water due to the diuretic effects of altitude and cold. Sweating due to physical exertion adds to the water loss. Especially in the first few days at altitude, there may be significant body water losses due to the vomiting associated with altitude mountain sickness. Diarrheal fluid losses may also be a factor. Giardia, an intestinal parasite that causes diarrhea, is common in high altitude regions. Also, the high magnesium content of glacier water, consumed as drinking water, can have a laxative effect.

## Using CeraLyte and Cerasport in the Field to Stay Hydrated

Remember: Maintaining proper hydration means to replace the fluid and electrolytes that are lost in sweat through activity or lost in episodes of diarrhea and/or vomiting.

- ▶ Cera Products are scientifically developed to help maintain proper

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Photo courtesy of US Dept of Defense

hydration.

- ▶ CeraLyte and CeraSport contain rice-based carbohydrate, electrolytes and fluid when appropriately mixed with water.
- ▶ Cera's products are unique due to a patented process, which provides short, medium, long and very long chains of rice-based carbohydrate.
- ▶ The enzymes sequentially breaks down the rice-based carbohydrate chains, which provides both fast and sustained hydration over time.
- ▶ CeraLyte is an oral hydration product used for severe dehydration due to diarrhea,
- ▶ vomiting or other illnesses.
- ▶ CeraSport is a sports drink that is used before, during and after physical activity.
- ▶ CeraSport EX1 is a sports drink for more extreme physical or environmental conditions. It contains higher levels of electrolytes, compared to CeraSport.
- ▶ If an individual in the field needs a sweat replacement product, but only has access to CeraLyte. They can add 2-4 times the amount of water that is listed in the directions on the packet. This will make a sweat replacement drink for them. ■

#### References:

"Nutritional Guidance for Military Operations in Temperate and Extreme Environments." U.S. Army Research Institute of Environmental Medicine. Natick, MA, 1993.

<http://www.usariem.army.mil>

[www.usariem.army.mil/nutri/2start.htm](http://www.usariem.army.mil/nutri/2start.htm)

[www.usariem.army.mil/HeatInjury.htm](http://www.usariem.army.mil/HeatInjury.htm)

*The first week of Airborne school at Ft. Benning was very demanding through rigorous training and extreme temperatures. During the second week, we were given CeraSport once a day to combat the effects of heat stroke and dehydration. All the soldiers that hydrated with CeraSport led the platoons up front, everyone else who relied on just water were falling out of the formations or worse, receiving IV's! It definitely aided our success throughout the school. AL*



Photo courtesy of US Dept of Defense

#### Difference from page 1

sodium absorption is chiefly dependent on the presence of glucose molecules. The net movement of water in the body occurs by osmosis; in response to an osmotic gradient that is established by sodium. As sodium is absorbed into the body, water follows; thus aiding in water absorption.

The rice syrup blend or rice syrup solids used in Cera's products are unique due to a patented process, which provides short, medium, long and very long chains of carbohydrate. As the enzymes sequentially breaks down the rice-based carbohydrate chains, CeraSport provides both

quick and sustained hydration over time. Additionally, rice-based carbohydrate is easily absorbed, has a low peak glucose impact and a less aggressive insulin response compared to sugar based sports drinks. These factors help to avert abdominal cramping, nausea and vomiting.

The purpose of rehydrating is to replace what the body has lost. When CeraSport is appropriately mixed with water it contains carbohydrates, electrolytes and fluid. This is exactly what the body needs for proper hydration before, during and after physical activity. ■



Charlene Riikonen receives presentation for Cera Products from CSM John Burns and Col. Gregory Hager, during best Ranger Competition, Ft. Benning, GA.

# ORS Products for Treating Dehydration Due to Illness and Activity

## Comparison of ORS Product Composition

	Carbohydrate (gm/L)	Sodium mEq/L	Potassium mEq/L	Base mEq/L	Osmolarity mOsm/L
<b>CeraLyte 50</b>	(rice-based) 40	50	20	30	<220
<b>CeraLyte 70</b>	(rice-based) 40	70	20	30	<235
<b>CeraLyte 90</b>	(rice-based) 40	90	20	30	<270
<b>WHO/Unicef ORS</b>					
“Standard Formula”	(glucose) 20	90	20	30	310
“Reduced-Osmolarity Formula”	(glucose) 13.5	75	20	30	245
<b>PediaLyte®</b>	(glucose, fructose) 25	45	20	30	250
<b>CeraSport</b>	(rice-based) 40	20	5	5	<150
<b>CeraSport EX1</b>	(rice-based) 20	35	10	15	<200
<b>Sports Drinks</b>	(sucrose, glucose-fructose) 56-68	20	3	3	330-380

\*Products listed above the horizontal line in Table 1 are appropriate for medical rehydration. Products listed below the horizontal line are appropriate for sport rehydration or sweat replacement.

The table above compares the formulas of the WHO/Unicef and other ORS preparations that are used for medical rehydration in the U.S.. Note the differences between products with regard to carbohydrate, sodium and osmolarity.

- ▶ CeraLyte 50 and 70 have the lowest osmolarity.
- ▶ CeraLyte 70 has greater amounts of carbohydrate with similar sodium content.

- ▶ CeraLyte 70 has greater carbohydrate and sodium content compared to PediaLyte®.

### Administration of ORS

- ▶ ORS is recommended for minimal dehydration, mild dehydration and moderate dehydration.
- ▶ ORS with 70mEq/L sodium can be used for both rehydration and maintenance in nearly all patients, even those who present with hypernatremia.

- ▶ ORS with 90mEq/L of sodium is recommended for patients with severe watery diarrhea.

- ▶ Vomiting does not rule out using ORS; very small amounts of liquid can be given frequently (5-10ml every 1-2 minutes).

- ▶ Oral rehydration is contraindicated when there is impaired consciousness, intestinal obstruction or shock.

- ▶ Recommended foods with the administration of ORS include; cereal, potatoes, crackers, yogurt and bananas.

- ▶ AVOID foods high in sugar and fat with the administration of ORS. ■

*The packets were a lifesaver... at 37 years old I just went through some vigorous military training in very hot conditions and if I didn't have the CeraSport, I would have probably been a heat casualty. PS*



**CERA**  
PRODUCTS INC.

**ORAL REHYDRATION PRODUCTS:**  
To Prevent and Correct Dehydration

- Holds GSA/VA, DAPA and CEC contracts to US Government Agencies
- Manufactured in the USA under GMP with WHO standards
- Under Joint Deployment Formulary for field hospitals
- Holds NSNs; available via Prime Vendors, other distributors or direct

#### TO ORDER

Cera's Products, call us or go to CeraStore at [www.ceraproductsinc.com](http://www.ceraproductsinc.com) to have CeraSport and CeraLyte conveniently delivered to your home or office.

A growing number of distributors and national chain stores also have CeraLyte available – call us to see if there is one near you.

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