HEALTH & WELLNESS

World Health Organization Oral Rehydration Solution Recipe

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The Essential Guide to the World Health Organization Oral Rehydration Solution Recipe

Few medical breakthroughs have saved as many lives as the simple, elegant formula known as Oral Rehydration Solution (ORS). Developed and standardized by the World Health Organization, this mixture of clean water, sugar, and salt has revolutionized the treatment of dehydration caused by diarrhea, cholera, and other conditions. Understanding the **World Health Organization Oral Rehydration Solution Recipe** is not just a matter of historical curiosity—it is a practical skill that can be a literal lifeline in emergency situations or areas with limited access to medical care. While pre-packaged ORS sachets are widely available and recommended, knowing how to prepare a safe and effective solution at home using common ingredients ensures that help is never far away. This article provides a deep dive into the recipe, its scientific basis, step-by-step preparation, and essential safety considerations.

What Is Oral Rehydration Solution and Why Is the WHO Recipe So Important?

Oral Rehydration Solution is a carefully balanced mixture of clean water, glucose (a simple sugar), and specific electrolytes, primarily sodium and potassium. It works on a fundamental physiological principle: glucose facilitates the absorption of sodium (and thus water) across the intestinal wall. This process, known as active glucose-sodium co-transport, allows the body to absorb fluids even during severe bouts of diarrhea, where normal water absorption is compromised.

The **World Health Organization Oral Rehydration Solution Recipe** is the internationally accepted standard because it strikes the perfect balance between effectiveness and safety. Too much sugar can worsen diarrhea (due to osmotic draw), too little salt won't replace lost electrolytes, and too much salt can be dangerous. The WHO formula has been refined over decades based on rigorous clinical trials and global health data. It is the gold standard recommended by health authorities worldwide for preventing and treating dehydration from any cause, particularly in children, the elderly, and those in low-resource settings.

A Brief History of a Life-Saving Innovation

Before the widespread adoption of ORS, severe dehydration from diarrhea was a leading cause of child mortality globally. The breakthrough came in the 1960s and 1970s when researchers discovered that adding glucose to a salt solution could dramatically enhance water absorption. Following field tests during cholera outbreaks in Bangladesh and India, the WHO adopted a standardized formula. Since then, this simple recipe is credited with saving tens of millions of lives, leading the medical journal *The Lancet* to call it "potentially the most important medical advance of the 20th century." Today, the **World Health Organization Oral**

Rehydrate Solution Recipe oral rehydration therapy (ORT) protocols.

The Official World Health Organization Oral Rehydration Solution Recipe

Understanding the precise measurements is critical. The current low-osmolarity WHO formula is safer and more effective than older versions, as it reduces the risk of hypernatremia (high blood sodium) and is more palatable. Below is the standard recipe for preparing one liter of ORS.

Ingredients You Will Need

- Clean water: 1 liter (about 1 quart). Ideally boiled and cooled or treated with chlorine. Always use the safest water available.
- Sugar (sucrose) or glucose: 6 level teaspoons. If using table sugar (sucrose), it must be white granulated sugar. Raw sugar, honey, or brown sugar are not recommended because their complex sugars can be poorly absorbed and may worsen diarrhea.
- Salt (sodium chloride): ½ level teaspoon. Use common table salt or iodized salt. Do not use sea salt, kosher salt, or low-sodium salt substitutes, as the sodium content varies significantly.
- Optional – Salt substitute (potassium chloride) and baking soda (trisodium citrate): For a more complete ORS that replaces potassium and bases, add ½ teaspoon of "Lite Salt" (potassium chloride, found in grocery stores) and ½ teaspoon of baking soda. However, the basic two-ingredient recipe (water, sugar, salt) is still highly effective and recommended when other ingredients are unavailable.

Step-by-Step Preparation Instructions

1. Sanitize your hands and container. Wash hands thoroughly with soap and clean water. Use a clean pot, jar, or bottle. If possible, boil the container or rinse it with boiling water.
2. Measure the water carefully. You need exactly 1 liter of clean drinking water. If you don't have a measuring cup, use a standard 1-liter bottle (e.g., many soda bottles are 2 liters; use half). Any variation can make the solution too salty or too sugary.
3. Add the dry ingredients. Stir in 6 level teaspoons of sugar and ½ level teaspoon of salt. If you're using the optional potassium and baking soda, add those now.
4. Stir until fully dissolved. Ensure no crystals remain at the bottom. The solution should be clear, not cloudy.
5. Taste test (optional but helpful). The solution should taste slightly saltier than tears but not unpleasantly salty. If it tastes very salty, it is too concentrated – discard and start over. If it tastes very sweet, it is also wrong. A proper ORS has a mild, "soup water" taste.
6. Use or store properly. The solution is best used within 24 hours. If kept longer, discard it to avoid bacterial contamination. Store in a sealed, clean container in a cool place, but do not refrigerate if using a salted solution without preservatives. Ideally, prepare a fresh batch daily.

Important Warnings for the WHO Recipe

The **World Health Organization Oral Rehydration Solution Recipe** is incredibly safe when made correctly, but errors can be dangerous. **Never** change the ratios. Adding more sugar does not make it more effective—it can cause osmotic diarrhea and worsen dehydration. Adding more salt can lead to hypernatremia, which can cause seizures, especially in children. If you are unsure about your measurements, use a calibrated measuring spoon. A level teaspoon means scraping off the excess with a knife. Do not use a rounded spoon.

How the WHO ORS Works: The Science Behind the Recipe

To appreciate why the **World Health Organization Oral Rehydration Solution Recipe** is so effective, we need to understand the physiology of diarrheal dehydration. When a person has diarrhea, the intestine's ability to absorb water is impaired. Normally, water follows sodium passively. However, during infection, the sodium transport mechanism is disrupted.

Glucose, however, can be absorbed independently. This glucose absorption "drags" sodium ions along with it through a specialized transport protein in the gut cell membrane. As sodium enters the cells, it creates an osmotic gradient that pulls water in from the intestinal lumen. Thus, by providing the right ratio of glucose and sodium, ORS turns the gut into a water-absorbing organ again, even when it is actively secreting fluid. The low-osmolarity formula (total solute concentration around 245 mOsm/L) is crucial because it maximizes this absorption without overwhelming the gut's capacity.

Electrolyte Balance: Sodium, Potassium, and Chloride

The recipe's ½ teaspoon of salt provides approximately 75 mmol/L of sodium and 65 mmol/L of chloride. This closely matches the concentration lost in typical diarrheal stools. The optional potassium (from Lite Salt) helps replace potassium lost in the stool, which is crucial for muscle and nerve function. The baking soda (or trisodium citrate) helps correct the metabolic acidosis that often accompanies severe diarrhea. Together, these electrolytes ensure that the body can maintain normal pH, nerve transmission, and muscle contraction—all while rehydrating.

When to Use the WHO Oral Rehydration Solution Recipe

ORS is primarily used to prevent or treat dehydration from diarrhea, vomiting, or any condition that causes rapid fluid loss. It is especially critical in:

- Acute diarrhea in children: This remains the leading cause of death among children under five. ORS can be given at the first sign of watery stools.
- Cholera outbreaks: Cholera causes massive, rapid fluid losses. ORS is the cornerstone of outbreak response.
- Heat exhaustion and heat stroke: When sweating leads to electrolyte imbalances, ORS can rehydrate more effectively than plain water.
- Vomiting from motion sickness or mild illness: Sips of ORS can help replace lost fluids when oral intake is difficult.
- Exercise or labor in hot environments: For prolonged sweating, ORS can be superior to sports drinks because of its balanced electrolyte profile.

When NOT to Use ORS

While ORS is remarkably safe, it does have limitations. Do not use ORS as a substitute for medical care in the following situations:

- Severe dehydration with lethargy or unconsciousness: These patients require intravenous fluids (IV) in a hospital setting.
- Paralytic ileus (bowel obstruction): If the gut is not functioning, ORS will not be absorbed and could cause vomiting and aspiration.
- Persistent vomiting where nothing can be kept down: Try giving very small, frequent sips (e.g., a teaspoon every 1-2 minutes). If that fails, seek medical help.
- Infants under 6 months: While ORS can be used, pediatric guidance is essential, and breastmilk or formula should continue.

Comparing Homemade ORS vs. Commercial Sachets

Commercial WHO-recommended ORS sachets are pre-mixed with exact amounts of glucose, sodium chloride, potassium chloride, and trisodium citrate. They are the preferred option because they guarantee consistency and safety. However, the homemade **World Health Organization Oral Rehydration Solution Recipe** is a vital backup for emergencies, travel, or when sachets are unavailable. The homemade version has a few drawbacks: it may lack potassium and base, and the shelf life is only 24 hours. Yet in a crisis, it can mean the difference between life and death.

How to Make a "Better" Homemade ORS With Common Ingredients

If you have access to a grocery store, you can improve the basic recipe. As mentioned, add ½ teaspoon of "Lite Salt" (potassium chloride) and ½ teaspoon of baking soda. This replicates the full WHO formula. Another alternative used in some community health programs is the "sugar-salt solution" which is exactly the two-ingredient recipe above. Always emphasize careful measurement.

Common Mistakes and How to Avoid Them

The most frequent errors in using the **World Health Organization Oral Rehydration Solution Recipe**involve measurement, water quality, and storage.

- Using a heaped teaspoon instead of level. Always level off with a straight edge. A heaped teaspoon of salt can double the sodium content.
- Using honey, fruit juice, or soft drinks. These contain fructose or complex sugars that do not facilitate sodium absorption and can worsen diarrhea. Only white sugar or glucose works.
- Adding too much water. A too-dilute solution may not have enough sugar to promote absorption. Stick to exactly 1 liter.
- Keeping ORS for more than 24 hours at room temperature. Bacteria can multiply quickly. If you cannot use it within 24 hours, discard it and make a fresh batch.
- Assuming ORS stops diarrhea. ORS does not stop the diarrhea; it replaces the fluids lost. Often the diarrhea continues, but the person remains hydrated and safe.

How to Administer ORS Effectively

For children and adults, the "sips" method is best. Do not force a large volume. For infants, use a dropper or small spoon. The general

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