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This database has the complete data set for the study entitled "Voluntary hydration with milk during exercise in the heat: exploring effectiveness and tolerance", collected between March 2021 and March 2022 as part of project VI-838-C0-304 at the Human Movement Science Research Center, Universidad de Costa Rica.

Subject: Code number assigned from 1 to 16.

Condition: Three conditions identified as: 1, water; 2, milk; 3, no drink.

Sex: Gender of the participant.

Age: In years.

Height (cm): In centimeters

Initial USG: Specific gravity of urine on arrival at the laboratory (estimation of hydration status), measured by means of a manual refractometer (ATAGO®, model URC - Ne, d 1.000-1.050, Minato-ku, Tokyo, Japan).

Final USG: Urine specific gravity at the end of the session (estimation of hydration status), measured by means of a manual refractometer (ATAGO®, model URC - Ne, d 1.000-1.050, Minato-ku, Tokyo, Japan).

Urine output: Amount of urine discarded at the end of the session. Reported in milliliters

Dehydration (BM): Level of dehydration presented at the end of the session taking into account the initial and final weight measurements using the formula: $\%DEHY = [(BM_{90} - BM_0)/BM_0] \times 100$.
Reported as a percentage of Body Mass

Voluntary fluid intake: Voluntary fluid intake during the 90-minute exercise session. Reported in milliliters

Mean heart rate bpm: Mean actual heart rate during the exercise session, according to a polar®, model ft7 heart rate monitor.

Mean RPE: Average perceived exertion during the exercise session, measured by a borg scale with scores from 6 (lowest perceived exertion) to 20 (highest perceived exertion)

Dry bulb temperature °C: Mean dry bulb temperature measured by means of a thermal stress monitor (Questemp36®)

Relative humidity %: Mean relative humidity measured by means of a thermal stress monitor (Questemp36®)

Reflux: A painful, burning sensation in the middle of the chest, behind the breastbone, rising from the lower tip of the sternum toward the throat.
Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being

measured every 15 minutes during the whole exercise protocol (90 minutes).

Heartburn: Burning, warmth, heat, stinging or pain that often begins in the upper abdomen just below the lower part of the sternum.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Abdominal distension: Condition in which the abdomen (belly) feels full and tight.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Cramping: Spasm (or contraction) of the upper digestive tract.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Vomiting: Forceful expulsion of some or all of the stomach contents through the mouth.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Nausea: Feeling of discomfort or discomfort in the back of the throat and stomach.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Intestinal cramps: Spasm (or contraction) of the lower digestive tract.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Urge to defecate: Evacuation of fecal matter (including solid stool, liquid stool, or mucus) from the anus.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Flatulence: Excess gas in the gastrointestinal tract causing expulsion of gas.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being

measured every 15 minutes during the whole exercise protocol (90 minutes).

Abdominal pain: Pain felt in the area between the chest and groin, often referred to as the stomach or belly region.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Loose stools or Diarrhea: A change in bowel movements causing stools that are softer than normal.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Dizziness: Feeling faint, dazed, weak or unstable.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Headache: Dull, pressure-like (not pulsatile) A tight band or press on or around the head. Widespread (not just in one spot or on one side).

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Muscle cramping: Sudden, involuntary contraction of one or more muscles.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Urge to urinate: Uncontrollable urge to urinate.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Thick saliva: Sensation of heaviness, stickiness or dryness in the mouth.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Belching: Expulsion of air or gas from the stomach or esophagus through the mouth.

Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being

measured every 15 minutes during the whole exercise protocol (90 minutes).

Fullness: Occurs when excess gas accumulates in the digestive tract. Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

Thirst: "cravings" for liquid. Mean GI symptom report, with a scale from 0 (no problem) to 9 (worst I have ever felt in my life). Modified from (Pfeiffer et al., 2009), being measured every 15 minutes during the whole exercise protocol (90 minutes).

BM baseline kg: Body mass in kg upon arrival at the laboratory

Bm 0: Body mass in kg before starting the exercise protocol

Bm 30: Body mass in kilograms 30 minutes after starting the exercise protocol

Bm 60: Body mass in kilograms 60 minutes after starting the exercise protocol

Bm 90: Final body mass in kg at the end of the exercise protocol (at 90 minutes)

Nfb 0: Net fluid balance at the time of starting the exercise protocol in kilograms, established with the formula: $nfb_{time} = b_{time} - bm_0$

Nfb 30: Net fluid balance 30 minutes after starting the exercise protocol in kg, established with the formula: $nfb_{time} = b_{time} - bm_0$

Nfb 60: Net fluid balance 60 minutes after starting the exercise protocol, in kg, established with the formula: $nfb_{time} = b_{time} - bm_0$

Nfb 90: Net fluid balance at the end of the exercise protocol (at 90 minutes). In kg, established with the formula: $nfb_{time} = b_{time} - bm_0$

BM 0 grams: Body mass at the start of the exercise protocol, in grams, for the calculation of sweat rate

BM 90 grams: Body mass at the end of the exercise protocol (90 minutes), in grams, for calculation of sweat rate

Sweat volume mL: Estimated sweat volume according to the formula: $Sweat = BM_0 - BM_{90} + Fluid\ intake - Urine\ output$. It uses the equivalence of $1g = 1mL$

Sweat rate mL/h: Average sweat rate according to the formula: $Sweat\ rate = (BM_0 - BM_{90} + Fluid\ intake - Urine\ output) / 1.5\ h$

Voluntary intake adjusted to weight and time: The formula: $Voluntary\ fluid\ intake\ in\ mL * kg^{-1} * h^{-1}$

mL: milliliters

kg: kilograms

h: hour

Reference for the GI symptoms:

APA 7TH edition format

Pfeiffer, B., Cotterill, A., Grathwohl, D., Stellingwerff, T., & Jeukendrup, A. E. (2009). The Effect of Carbohydrate Gels on Gastrointestinal Tolerance during a 16-km Run. *International Journal of Sport Nutrition and Exercise Metabolism*, 19(5), 485-503. <https://doi.org/10.1123/ijsnem.19.5.485>

American Chemical Society (ACS) format

Pfeiffer, B.; Cotterill, A.; Grathwohl, D.; Stellingwerff, T.; Jeukendrup, A. E. The Effect of Carbohydrate Gels on Gastrointestinal Tolerance during a 16-Km Run. *International Journal of Sport Nutrition and Exercise Metabolism* 2009, 19 (5), 485–503. <https://doi.org/10.1123/ijsnem.19.5.485>.

(For detailed methods, please refer to the published manuscript)

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