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PREHYDRATION OF WORKING DOGS

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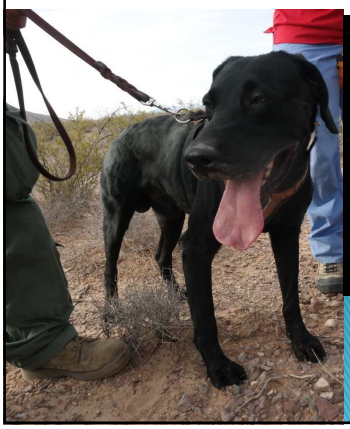

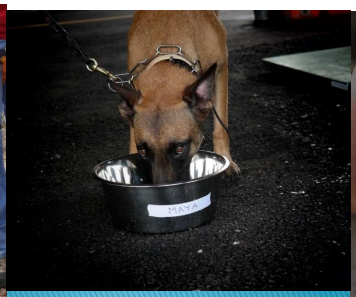

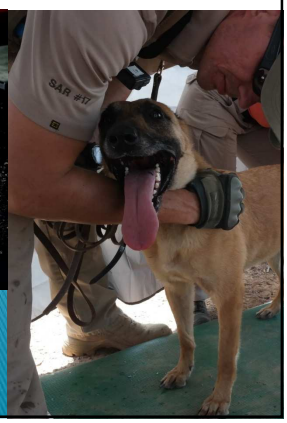

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- Dog handlers currently use
  - water (W),
  - subcutaneous fluids (SQ),
  - oral electrolyte solutions (OES)

  to prevent dehydration

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Strategies:

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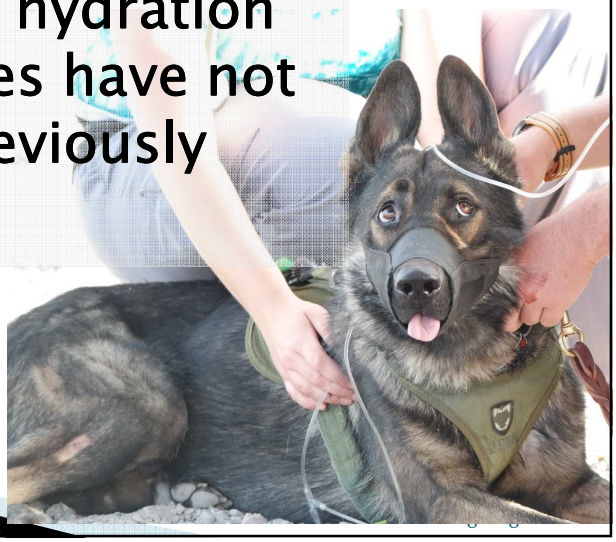
- Safety and efficacy of these hydration strategies have not been previously studied!



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Aim 1

- Compare 3 hydration strategies on hydration and performance in Border Patrol dogs screening vehicles on the Texas border in the summer.

Study design

Cross over design:

- 7 vehicle screening canines
- Rio Grande Sector (Kingsville Station)
- Working 30 min shifts

- Each dog was randomly assigned to each of three prehydration.

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Vehicle Screening Hydration:

- Water –
  - offered at 10 ml/kg initially and every 30 min
- Subcutaneous fluids –
  - Balanced electrolyte (Plasmalyte®) given 15 ml/kg initially and then water offered 10 ml/kg every 30 min
- Oral electrolyte (OES)
  - (Hydrolyte®) offered at 10 ml/kg initially and then water (10 ml/kg) offered every 30 min
  - Failure to drink >3ml/kg of water⇒ offer 10 ml/kg OES

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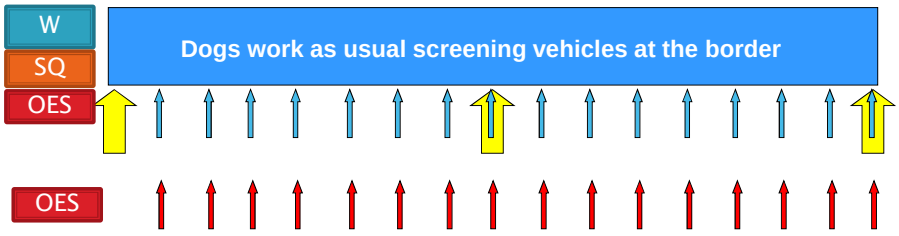

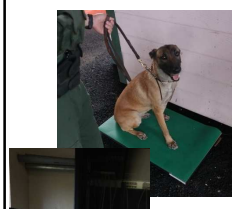

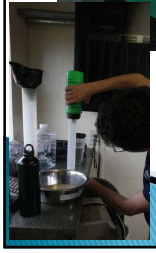

= offer water, evaluate for heat stress

= offer OES if did not drink 33% of water – OES group ONLY

= weigh, collect blood, urine

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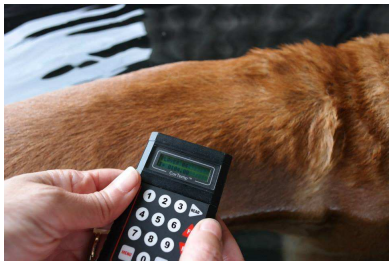
Parameters

- Blood
  - Electrolytes (Na, K, Cl)
  - lactate
- Urine concentration and Na
- Body weight
- Pulse, respiratory rate, core temperature
- Activity



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Statistics

- Changes in each dog's weight, core temperature, and blood parameters were [illegible] models in [illegible]
- The effects of hydration method, demographic variables (sex, breed, age), dog's w[illegible] pulse and [illegible] line specific gravity during the test period, and ambient temperature and humidity were [illegible] full model for each outcome.
- The drop1 function was used to determine which factors contributed significantly to t[illegible] those factors were included in a refined model.
- Generalized linear models were used when outcomes had distributions that deviated m[illegible] based on measures of skewness and kurtosis.

Basically we compared the response to each of the treatments over the day for each dog. This allowed us to account for the unique behavior of individuals

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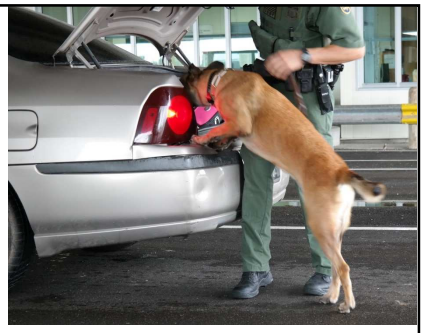
Results



- N= 7 dogs,
- 3 female, 4 male
- Mean age 5.5 ± 1.9 yrs
- Mean Wt 30.5 Kg ± 4.2
- Median work time 6 hours (IQR 5,6)
- Median Temp 84.8F (range 74.0-99.9)
- Median Humidity 70% (range 39-100)
- Windspeed – median 5.6 mph, (range 0-18)

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Fluid intake

- Higher with oral electrolyte

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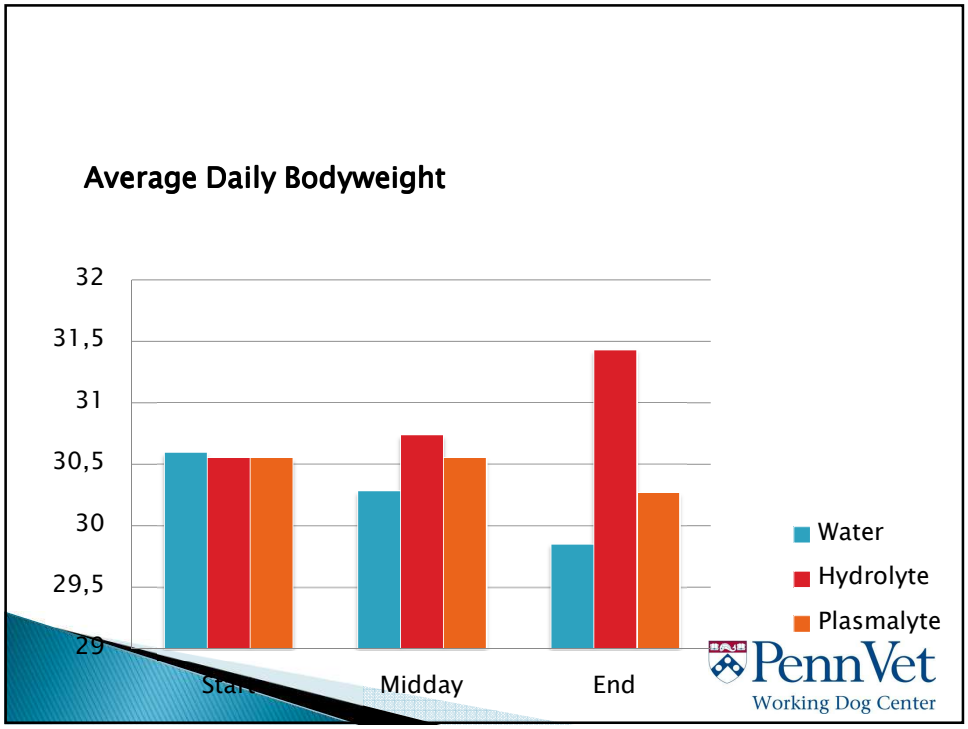

Blood values (blood pH)

- End of day TCO2 was preserved with oral electrolyte

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Electrolytes

- No change regardless of strategy

Avg Lactate 1.0
Avg body temp 101.4 F

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Conclusions

- In these dogs conditioned to work in the hot and humid environment of the TX border,
- All strategies were safe
- Oral electrolyte was more palatable, leading to increased consumption
  - Higher TCO_2,
  - Lower HCT,
  - Higher body weight,
  - Higher Na excretion
  - less concentrated urine

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Aim 2
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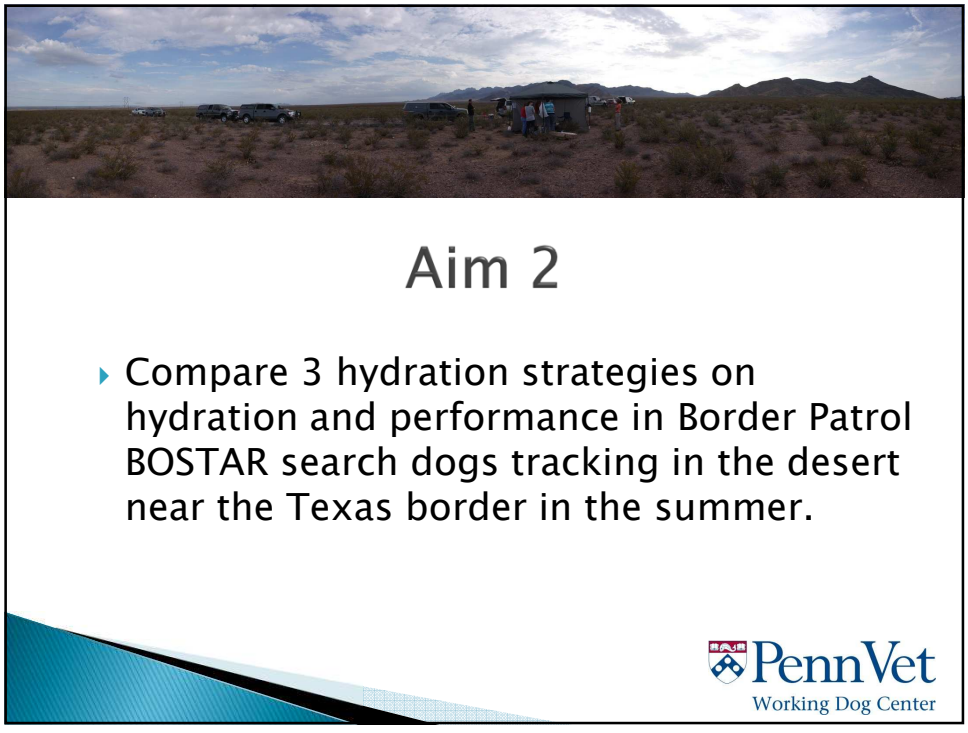
Aim 2
Compare 3 hydration strategies on hydration and performance in Border Patrol BOSTAR search dogs tracking in the desert near the Texas border in the summer.
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Study design

Cross over study:

- 7 tracking canines
- El Paso Sector
- Two 1 mile tracks/day

- Dogs randomly assigned to each of three prehydration strategies.

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Tracking Hydration:

- **Preload prior to track**
  - Water – offered at 10 ml/kg
  - Subcutaneous fluids – Balanced electrolyte (Plasmalyte®) at15 ml/kg
  - Oral electrolyte (OES) –(Hydrolyte® –30% reduction in Na, 30% increase in K) offered at 10 ml/kg
  - Flavoring (Hydrolyte ® chicken flavor, no electrolytes) offered at 10 ml/kg

- **Maintenance during track**
  - Water offered as determined by the handler

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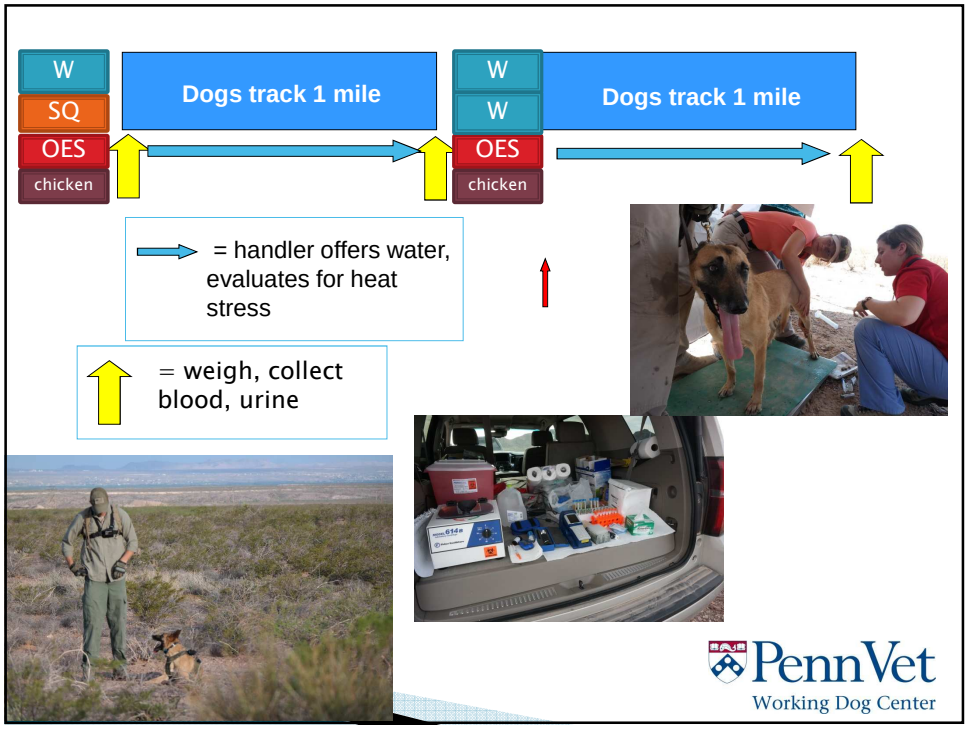

Parameters

- Blood
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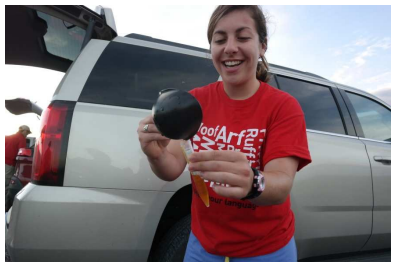
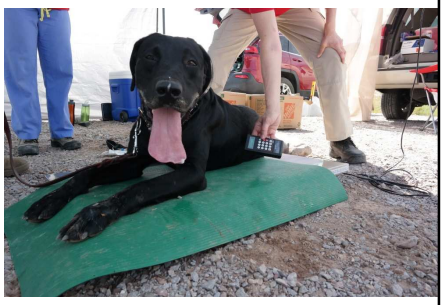
  - lactate
- Urine concentration and Na
- Body weight
- Pulse, respiratory rate, core temperature
- Activity





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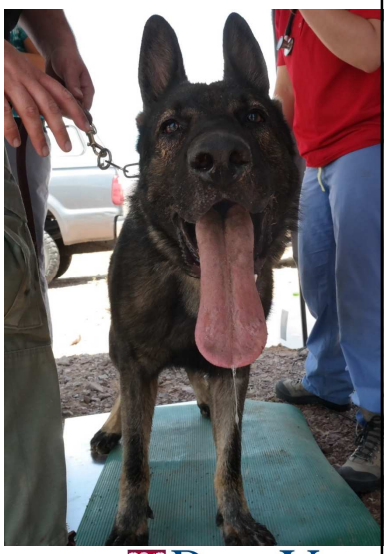
Results

- N= 7 dogs,
- 4 female, 3 male
- Mean age 5.0 ± 2.3 yrs
- Median wt 31.5 Kg
- Track 1:
  - Time 24.0 ± 7.1 min
  - outdoor T 28.4 °C
  - humidity 47%
- Track 2
  - Time 25.2 ± 16.0 min
  - outdoor T 32.4 °C
  - humidity 38%



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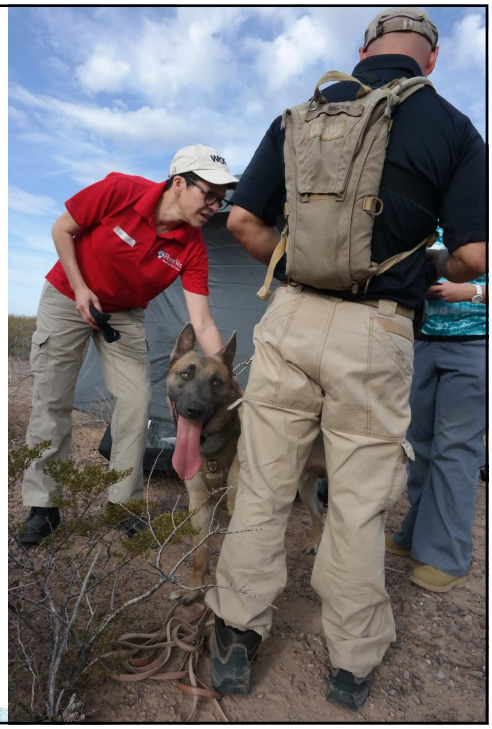
Preliminary RESULTS

- Every dog started out dehydrated . . .
  - Median USG 1.065



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Conclusions

- In these dogs conditioned to work in the hot desert environment of the TX border,
- All strategies were safe
- Pre-hydration did not have a significant effect on
  - electrolytes
  - lactate
  - maximum temperature
  - body weight
- Water alone -> increase in T after 2nd track

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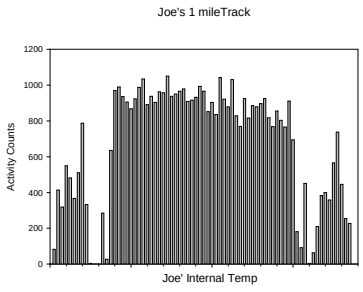
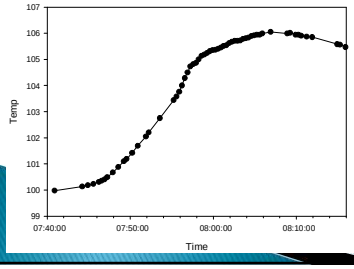
Joe's Track, Activity and Temp





Avg 2780 counts/min
(Checkpoint avg 749 cts/min)
Peak Temp 106
Track time 35 min 1 mile

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