

# Topi-Pump Accuracy and Repeatability

Container-closure systems play a vital role in the compounding and dispensing processes. For semisolid dosage forms, factors like dosing accuracy and repeatability of a container closure are equally as important as homogeneity of the final dosage form. This study was designed to determine the suitability of Topi-Pump airless pump devices for dispensing a range of semisolid vehicles and to compare this device to two other commonly used competitor pumps on the market.

## Materials and Methods:

Testing was performed using the 30mL size Topi-Pump with the 0.5mL actuator top. Two similar 30mL devices designed to dispense 0.5mL per actuation were selected to act as comparators. Each device was filled with 30g of HRT Heavy, Phytobase, Salt Stable LS Advanced, and Pentravan. These vehicles were selected as they represent a range of viscosities and compositions. To simulate real-life use, each dispenser was primed until the dispensed mass per stroke stabilized around the nominal target dose of 0.5mL. Dispensers were actuated four times daily (two consecutive actuations in the morning and two in the afternoon) for 10 consecutive days, corresponding to 40 actuations and mimicking twice-daily use with two actuations per application. The preparations were stored at room temperature, and the device was held at a 45° angle for all actuations. The weight of each actuation was recorded and adjusted using the specific gravity of the vehicle so that results were reported in milliliters.

## Results:

Across the four vehicles tested, Topi-Pump had an average volume dispensed closest to the desired 0.5mL value

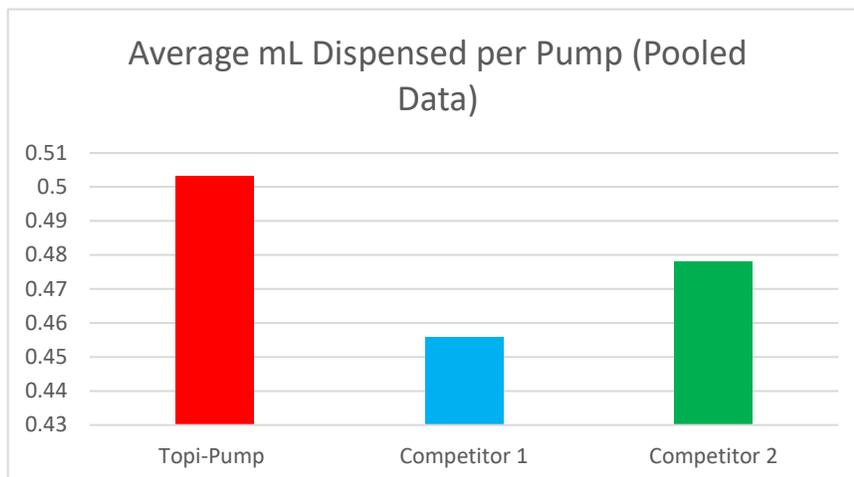


Fig 1: Average amount dispensed volumetrically across all vehicles (HRT Heavy, Phytobase, Salt Stable LS Advanced, and Pentravan)

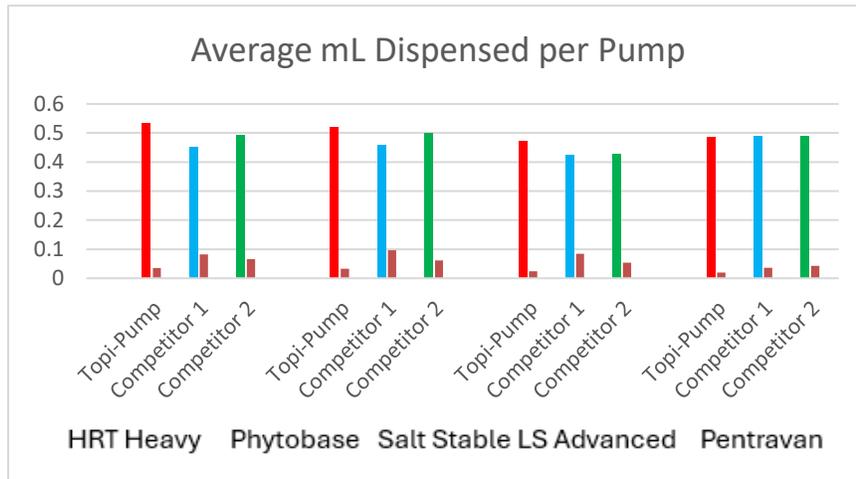


Fig 2: Average amount dispensed and standard deviation separated by vehicle

## Conclusion:

Topi-Pump showed lower variability and closer clustering around the target mass range than two comparator calibrated dispensers at the recommended storage temperature and dispensing orientation.

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