



Formula Mixing Knowledge of Pediatric Residents at a Quaternary Care Center

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INTRODUCTION

Why do we care?

- 18% of infants are never offered breast milk¹
- 56% of infants at 3 months receive formula¹
- Complications of improper mixing include:
 - Electrolyte abnormalities
 - Hypo/hyperglycemia
 - Failure to thrive
- Majority of new parents learned from friends or self-taught
 - Over 70% received no guidance from healthcare providers²
 - Half unsure they were mixing correctly³
 - Many don't read instructions for mixing unfamiliar formula³
 - Afraid to ask providers' for advice⁴
 - 50% felt pressured to breast feed
 - 32% felt they failed by giving formula
 - 25% worried about providers shaming or stigmatizing
- Low income, SES, class associated with formula feeding¹

Formula Scoop Measuring⁴

- Smallest amount measured was 50% of the largest⁵
- Formula is weight, not volume based
 - Risk of "packed down" formula
- More likely to overfill than under-fill

Measuring Cup Choice⁶

- Dry measuring cup – can fill to the brim – level off with knife
- Liquid – allows measurement of meniscus – no spills
- Flour – 13% variance in dry cup vs. 26% variance in wet cup
- Water – 10% variance in wet cup vs. 23% in dry cup
- Many bottles missing volume measurements or inaccurate

Powdered Formula⁷

- Powdered formula is **NOT** sterile
 - Cronobacter (Enterobacter) sakazakii
 - Salmonella enterica
- Cannot replicate in unmixed formula, but may live >1 year
- 5C (41 F) or less prevents growth
- Even if 70 C water used, bacterial spores may survive
- Bottle feeding introduces oral flora
- Partially drank formula should be finished in one hour or less, otherwise throw away remnant

Prep

- Microwaves can superheat pockets of formula; burn risk
 - 35% or more of parents use microwaves to heat bottles²
- Warm water bath or bottle warmers are appropriate

CONCLUSIONS

- Overall, parents feel undereducated and uncomfortable mixing formula
- Formula mixing is not routinely discussed at resident well baby visits
- IUSM Pediatric Residents are unprepared to offer advice regarding formula best practices
- Significant culture of "formula shaming" makes some parents afraid to ask for assistance
- Residents may benefit from a formula educational intervention

FUTURE DIRECTIONS

- Pre-test new residents with same survey
- Have residents complete branching scenario module shown via QR code
- Provide residents with "cheat sheet" of high-yield formula best practices
- Post-test residents to evaluate enhancement of knowledge

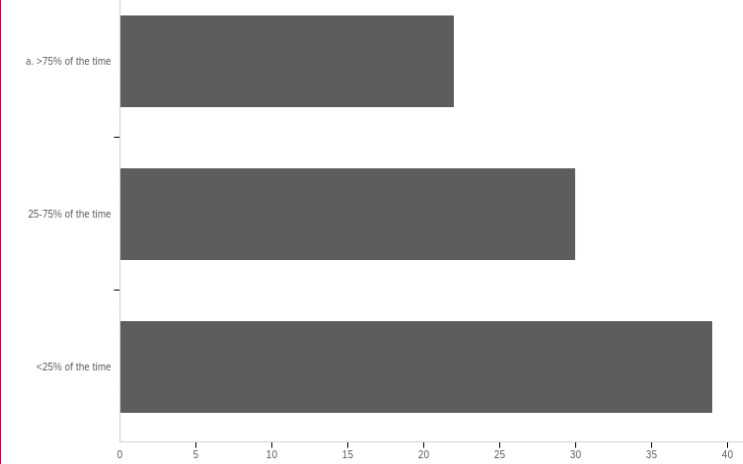
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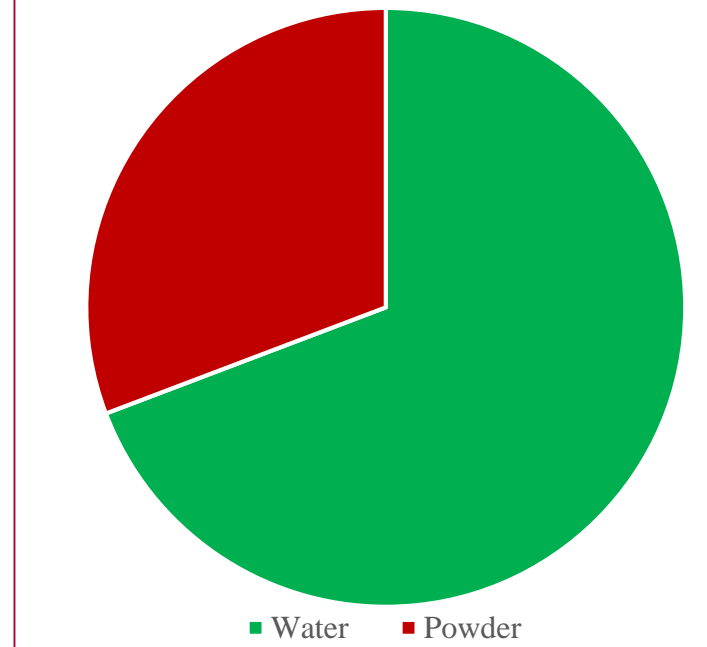
STUDY DESIGN AND RESULTS

- Blinded, online survey
- Pediatric, combined pediatric residents
- 91 total participants, PGY 1-5

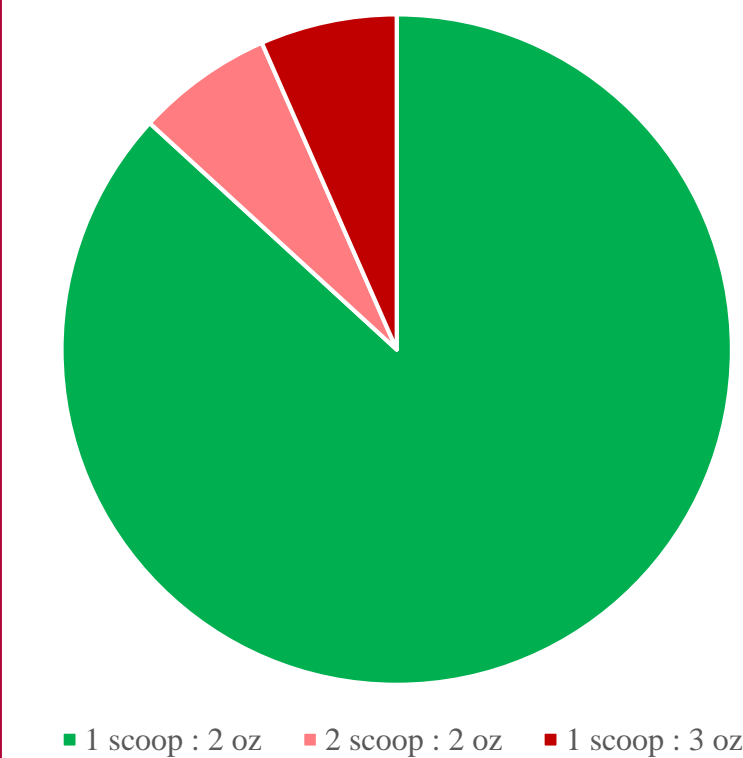
During a routine well-child check, how often do you ask how formula is prepared



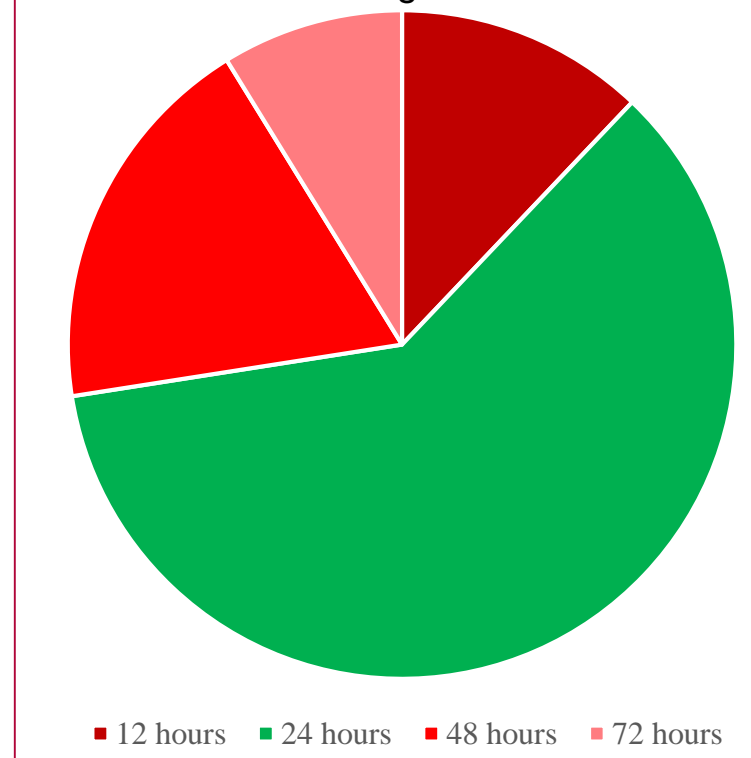
When mixing formula, should you add the powder or water first?



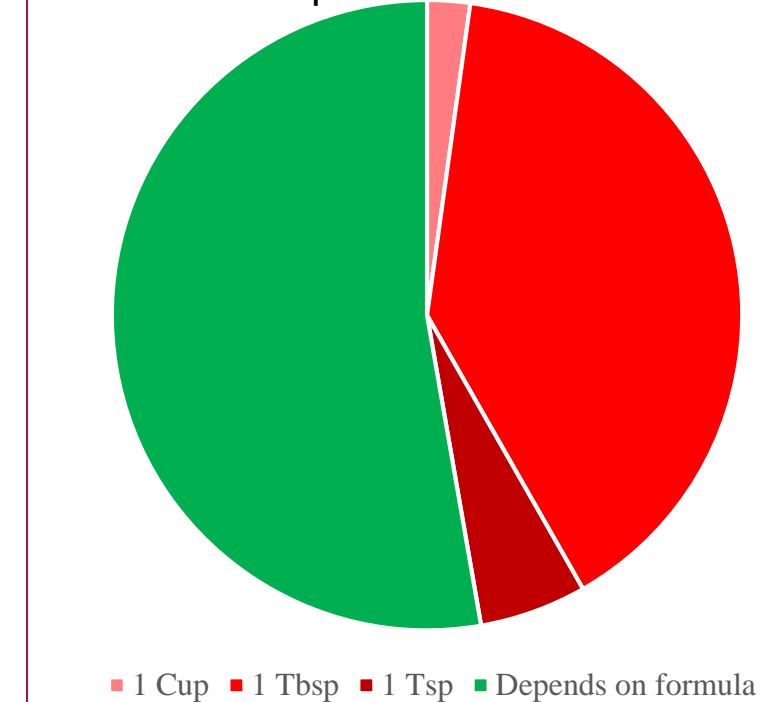
What is the ratio of scoops:formula used to make standard formula



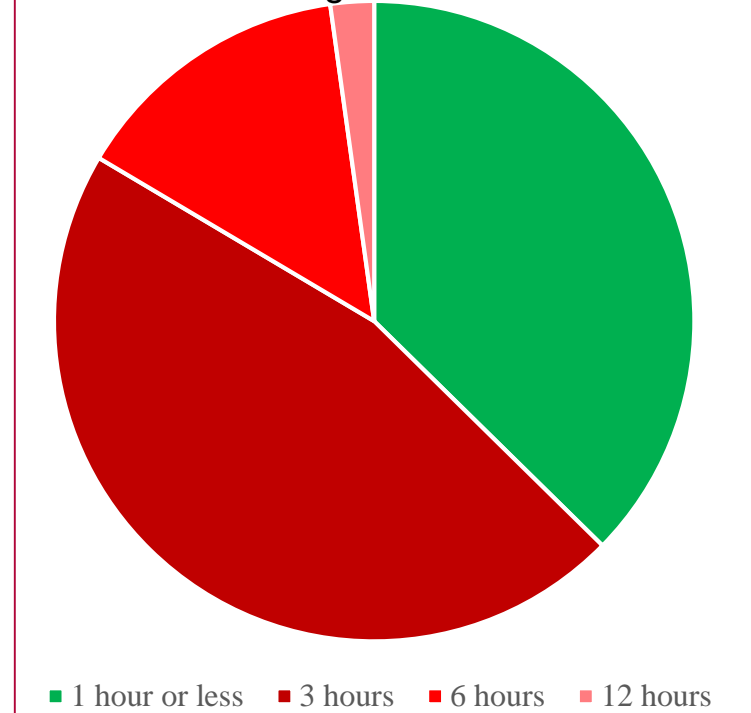
How long is undrunk, mixed, refrigerated formula good for?



The scoop that comes with the formula container is equal to:



How long is formula from a partially drank bottle good for?



LEARNING MODULE



SCAN ME